The Johns Hopkins
and Red Cross
Red Crescent

Public
health guide
in emergencies

Second edition ▮ 2008

JOHNS HOPKINS
BLOOMBERG
SCHOOL *of* PUBLIC HEALTH

International Federation
of Red Cross and Red Crescent Societies

The Johns Hopkins Center for refugee and Disaster Studies, established in 1998, is based in the Division of community Health and Health Systems of the Department of International Health. The Center has primary responsibility for emergency health related courses taught within the Department and provides a Certificate in Humanitarian Assistance for qualified degree program students. Each summer, the Center offers the Health Emergencies in Large Populations (HELP) course sponsored by the International Committee of the Red Cross (ICRC), the American Red Cross and the Pan American Health Organization (WHO).

In addition to its teaching responsibilities, the Center carries out operational research in partnership with other universities and implementing organizations better meet the health needs of persons displaced by conflict and disasters. The Center also provides technical assistance to implementing organizations in areas, such as planning, monitoring and evaluation of the impact services. The Center planes special emphasis – in its research and technical assistance – on populations trapped in "permanent crises", returning home or repatriating, and/or during rehabilitation.

Cover photo: International Federation

Foreword

This is the second edition of *The Johns Hopkins and International Federation of Red Cross and Red Crescent Societies Public Health Guide for Emergencies,* a textbook that has been widely used in the classroom and the field. We are excited with the production of this second edition which captures both the experience of the Federation and the academic public health perceptions of Johns Hopkins University. We believe that the result of this partnership is an action book to help implementers built programs and activities on a solid footing. This guide has been almost completely rewritten and updated from the first edition, an indication of the rapidity and the extent of changes in humanitarian assistance practices which have occurred in just a few years.

The book is organized around issues that humanitarian aid workers from international organizations must face in the field. It seeks to provide guidance in practical terms toward the solution of the many technical and management issues that challenge aid workers following natural and man made disasters including complex humanitarian emergencies. The authors seek to help build the skills of less experienced aid workers as well as their colleagues who find themselves responsible for activities outside their area of skills or training. For the experienced, the technical and operational advances in recent years are covered. To promote learning from the Public Health Guide, glossaries, charts and references for further reading are included.

It is our hope that this guide will further strengthen the capacities of the individuals and organizations providing assistance in emergencies so that the burden of injury, illness and death which accompany disasters can be greatly reduced in the years to come. It is our wish that providers will think forward to ways which reduce the risks and vulnerabilities of populations to events which cannot always be prevented disasters still bring far too much suffering and death. Careful application of public health knowledge can greatly reduce this unnecessary burden

Encho Gospodinov
Director,
Policy and Communications Division
International Federation

.

Gilbert Burnham
Co-Director, Center for Refugee and
Disaster Response
The Johns Hopkins Bloomberg School
of Public Health

Photo: American Red Cross

Contents

Contents

Chapter 10: Management **486**

Annex 1: References and suggested readings **562**

Annex 2: Glossary **578**

Contents

Indonesia – Photo: International Federation

Acknowledgements

Project director, introduction, and chapter 1: disaster definitions author

Gilbert M. Burnham, MD, MSc, PhD is the co-director of the Center for Refugee and Disaster Response at Johns Hopkins. He has extensive experience in emergency preparedness and response, particularly in humanitarian needs assessment, program planning, and evaluation that address the needs of vulnerable populations, and the development and implementation of training programs. He also has extensive experience in the development and evaluation of community-based health program planning and implementation, health information system development, management and analysis, and health system analysis. He has worked with numerous humanitarian and health development programs for multilateral and non-governmental organizations, regional health departments, ministries of health (national and district level), and communities in sub-Saharan Africa, Asia, and Eastern Europe. A major current activity is the reconstruction of health services in Afghanistan.

Project manager and chief editor

Emily Christensen Rand, PE, MPH, MBA completed a Master's in Public Health and a Master's in Business Administration at Johns Hopkins University, where she also worked at the School's Center for Refugee and Disaster Response. She's worked for Oxfam and the American Red Cross in Banda Aceh, Indonesia, and the International Rescue Committee in Darfur, Sudan. She was a technical assistant at the FEMA World Trade Center response and a Peace Corps volunteer in Lesotho. She also worked in the greater Washington, DC area as a civil engineer and is a US licensed engineer.

Chapter 2: Health systems and infrastructure authors

William M. Weiss, DrPH is a faculty member in the Center for Refugee and Disaster Response (CRDR) and the Department of International Health at Johns Hopkins Bloomberg School of Public Health. He is a public health monitoring and evaluation and health information system specialist with over 15 years experience working in Africa, Asia and Latin America. Dr. Weiss has a special interest in rapid assessment methods serving immediate decision-making in settings where resources (including time) are limited. He is an instructor in the Health Information Systems and Quality Assurance Management Methods courses at The Johns Hopkins University, and carries out field-based training in both qualitative and quantitative methods (such as Lot Quality Assurance Sampling surveys).

Shaun Morris, MD, MPH, FRCP(C) is a Canadian trained pediatrician who is currently a clinical fellow in Infectious Diseases at The Hospital for Sick Children and The University of Toronto. He graduated from Johns Hopkins University with a Master's in Public Health in 2006. He has worked as a physician South America, South-East Asia, and East Africa.

Chapter 3: Emergency health services authors

Alexander Vu, MD, MPH is an assistant professor in the Department of Emergency Medicine and at the Department of International Health. He is boarded in Internal Medicine and Emergency Medicine. He received his MPH in International Health at JHSPH. He is currently the International Emergency Medicine Fellowship Director at the Center for Refugee and Disaster Response. He is involved in development work and emergency preparedness/disaster response. He has responded to the Indian Ocean Tsunami, the Katrina Hurricane and coordinated the response for the Pakistan earthquake. He has worked in the Philippines, Indonesia, India, Nepal and Bangladesh for hospital emergency preparedness and helped to develop an emergency medicine trauma curriculum for Azerbaijan. He has worked with WHO on emergency preparedness initiatives. He is involved in research and monitoring & evaluation of HIV/AIDS programs in Ethiopia, Kenya, Mozambique and Uganda.

Anjali Pant, MD, MPH is a Clinical Instructor in Emergency Medicine at the Cornell campus of the New York Presbyterian Hospital. She completed her International Emergency Medicine Fellowship and Master's in Public Health at Johns Hopkins, where she was inducted into the Delta Omega public health honor society. She completed her emergency medicine training at the University of Illinois at Chicago, and her Doctor of Medicine from the University of Texas Health Science Center at San Antonio. Her undergraduate degree is in Chemical Engineering from Rice University. She was recognized by medical school faculty and students with the Healthcare Foundation of New Jersey 2001 Humanism in Medicine Award, and was inducted in 2005 to their chapter of the Gold Humanism Honor Society.

Chapter 4: Reproductive health care author

Elizabeth Rowley, MHS, MIA has worked with the Center for Refugee and Disaster Response on research projects supporting the integration of refugee and local health systems in Uganda and investigating the mortality and morbidity of humanitarian workers. Over the past fifteen years, her field experience includes program management, evaluation, and research in refugee and post-conflict settings in Thailand, El Salvador, southern Sudan, Uganda, Tanzania, Sierra Leone, and Liberia. Her most specific area of interest is reproductive health in conflict-affected populations. Elizabeth has a Master's in International Affairs degree from Columbia University and a Master's in Health Sciences degree from the Johns Hopkins Bloomberg School of Public Health where she is currently a doctoral student.

Chen Reis, MPH, JD focuses on health and human rights in emergencies. She has researched and published extensively about women's health, gender, and gender-based violence in humanitarian contexts. She received her MPH from Johns Hopkins University School of Hygiene and Public Health and her JD from Columbia University.

Lynn Lawry MD, MSPH, MSc is a specialist in internal medicine, disaster research, and epidemiology. She is currently the Director of Research for the Center for Disaster and Humanitarian Assistance Medicine (CDHAM) at the Uniformed Services University of Health Sciences (USUHS) in Washington, DC. In her 15 years in humanitarian aid she has been in more than a dozen complex humanitarian disasters and has researched health and human rights issues in Taliban-controlled Afghanistan, Sierra Leone, Iraq, Nigeria, Darfur, and Hurricane Katrina communities. In addition to her position at CDHAM/USUHS, she is Director of the Initiative on Global Women's Health in the Division of Women's Health, faculty at Brigham and Women's Hospital and Harvard Medical School and an Associate at John's Hopkins School of Public Health.

Chapter 5: Emergency mental health care authors

Frederick M. Burkle, Jr., MD, MPH, DTM, a retired Professor, is trained in Emergency Medicine, Public Health & Tropical Medicine, Pediatrics, and Psychiatry. He has over 40 years experience in complex humanitarian emergencies worldwide ranging from frontline field and refugee work to senior advisor and a diplomatic posting. He is currently a Senior Fellow at the Harvard Humanitarian Initiative, the Harvard School of Public Health, and Senior Scholar and Scientist at Johns Hopkins University Center for Refugee and Disaster Studies.

Pritika Chatterjee, MA, MPH is a third year doctoral candidate in the Department of Mental Health at the Johns Hopkins Bloomberg School of Public Health. She is a trained mental health professional with professional experience as a school psychologist in New Delhi, India. Ms. Chatterjee earned an MPH at Harvard University, where she was the recipient of several fellowships and awards, such as the Ellen Jones Public Health Practice Fellowship and the Harvard-MIT-sponsored Mind Brain Behavior Fellowship. Ms. Chatterjee spent three years working as a program specialist at the United Nations Population Fund (UNFPA) headquarters in New York. At UNFPA, she managed projects on HIV prevention, humanitarian crises, human rights, and peer education in Middle Eastern and North African countries, such as Lebanon, Sudan, Palestine, Morocco, Syria, Egypt, and Jordan.

Judith Bass, PhD, MPH is currently an Assistant Professor in the department of Mental Health at the Johns Hopkins Bloomberg School of public health where she received her PhD in psychiatric epidemiology. Her major area of interest is in the development of methods for assessing mental health and mental illness in non-Western cultures with the intention of using these assessments to investigate the effectiveness of innovative prevention and intervention strategies. With her background in economic development, she is also working on methods for evaluating the economic and development impact of mental health interventions.

Paul Bolton, MBBS, MPH, MSc is an Associate Research Scientist at the Johns Hopkins Bloomberg School of Public Health. Dr. Bolton specializes in design, monitoring and evaluation of humanitarian aid programs, including the application of scientific methods to assessment of needs and program impacts. His main area of work in recent years has been in exploring the need for, and impact of community based mental health programs in developing countries after wars and disasters.

Chapter 6: Epidemiology and surveillance and chapter 7: Control of communicable diseases authors

Saade Abdallah, MBChB, MPH is a female Kenyan public health professional who currently serves as the Director of Research Operations for the International Center for Reproductive Health, a Belgian NGO based in Mombasa. Prior to this she was the HIV/AIDS and M&E Technical Advisor for JHPIEGO, Kenya since 2005 where she managed PEPFAR funded programs for adult and pediatric ART and prevention of mother-to-child-transmission. Dr. Abdallah earned her MPH from Johns Hopkins University in 1997 and an International Diploma in Humanitarian Assistance from the Center for International Cooperation, City University of New York and the Royal College of Surgeons in Ireland in 1999. She earned a Bachelor's degree in Medicine and Surgery from the University of Nairobi.

Rajesh Panjabi, MPH focuses his clinical, research and advocacy work on eliminating health inequalities in settings of extreme poverty. He is a founding director of Tiyatien Health, an organization that works in partnership with communities in rural Liberia to improve healthcare and the fundamental rights of the poor. With the Liberian Ministry of Health, Panjabi led the establishment of Liberia's first comprehensive, community-based HIV treatment program -- the HIV Equity Initiative. He received his MPH in epidemiology from the Johns Hopkins School of Public Health, where he was a Sommer Scholar, and his medical degree from the University of North Carolina School of Medicine.

Chapter 8: Water, sanitation and hygiene in emergency author

Cathie Frazier, MS, MPH is the Director of the Training and Scholarship Program at the Johns Hopkins Center for American Indian Health. Her technical background is in engineering. She previously worked with the US Public Health Service, Indian Health Service constructing sanitation facilities for Native American communities and on environmental health related projects in Jordan, Switzerland and Sudan for organizations including WHO, UNICEF and USAID.

Chapter 9: Food and nutrition author

June Neff Pierre-Louis, PhD, MPH is a nutrition consultant. She received her doctorate in Nutritional Sciences from Cornell University in 1995 and a Master's in Science in Nutritional Sciences from the same institution in 1982. She received a Master's in Public Health in Epidemiology from the University of California, Los Angeles School of Public Health in 1982. Dr. Pierre-Louis has

worked in nutrition emergency situations in Ethiopia, Burundi, Haiti, and eastern Chad. She has worked with UNICEF, UNHCR, the United States Agency for International Development, and Helen Keller International. In addition, she has directed nutrition research studies in Mali, Haiti, and Burundi, and has taught nutrition courses at the City University of New York and Long Island University.

Chapter 10: Management author

Saade Abdallah, MBChB, MPH (Bio include under Chapter's 6 and 7)

International Federation of Red Cross and Red Crescent co-authors

Hakan Sandbladh, M.D., Senior Public Health in Emergency Adviser and specialist in Gyn/Obs, Surgery, has spent nearly three decades in some 25 countries worldwide, doing health and public health in emergencies with various health related NGOs, governments and the International Federation. Starting in 1994, he created and ran the overall relief health services of the International Federation, where he introduced the Public Health in Emergency concept, created various tools and together with colleagues developed systems such as the Emergency Response Units, Field Assessment and Coordination Teams etc. now widely used by the International Federation.

Adelheid Marschang, M.D., a specialist in Internal Medicine, Tropical Medicine and Infectious Diseases, has been working in the Public Health in Emergencies Unit of the Secretariat of the International Federation between 2003 and 2007, serving two years as Acting Unit Manager. She has 14 years public health in emergencies field experience and has worked in emergencies in all continents, particulary the Great Lakes Crisis in Africa, Hurricane Mitch, the Kosovo refugees in Albania, the Gujarat and the Bam earthquakes and Chad, etc. She and has also worked on technical support and capacity building at the Red Cross and Red Crescent Societies. She worked for 13 years in clinical medicine, tropical medicine and infectious disease medicine at the Department for Tropical Medicine in the division of Internal Medicine, Ludwig-Maximilians-University of Munich as assistant professor, in clinical work, travel clinic, training of medical students, lecturing and research.

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Acknowledgements

Acronyms/Abbreviations

http://acronyms.thefreedictionary.com/

Term	Definition
ABC	Airway, Breathing and Circulation
AIDS	Acquired Immune Deficiency Syndrome
ANC	Ante Natal Care
API	Annual Parasite Incidence
APPLE	Aids Prevention and Positive Living Programme
ARCHI 2010	African Red Cross/Red Crescent Health Initiative 2010
ARDS	Acute Respiratory Distress Syndrome
ARI	Acute Respiratory Infection
ART	Anti Retroviral Treatment (against HIV/AIDS)
ARV	Anti Retro Viral
AWB	Air Way Bill
BBT	Basal Body Temperature
BCC	Behaviour Change Communications
BCG	Bacille Calmette-Guérin vaccine against TB
BPI	Better Programming Initiative
CBO	Community Based Organizations
CBW	Chemical and Biological Warfare
CDC	Centers for Disease Control and Prevention (in the US)
CDD	Control of Diarrhoeal Disease
CFR	Case-Fatality Rates
CHD	Community Health Doctor
CHEs	Complex Humanitarian Emergencies
CHN	Community Health Nurse
CHV	Community Health Volunteer
CHW	Community Health Worker
CMR	Crude Mortality Rate
CNS	Central Nervous System

Term	Definition
DM	Disaster Management
DMT	Disaster Management Training
DOT	Directly Observed Treatment
DOTS	Directly observed short course TB treatment strategy
DOTS+	TB treatment strategy including multi resistant cases
DPT	Diphtheria-Pertussis-Tetanus (vaccine)
DSM	Dried Skim Milk
ECPs	Emergency Contraceptive Pills
EmOC	Emergency Obstetrical Care
ENN	Emergency Nutrition Network
EOC	Emergency Obstetric Care
EPI	Expended Programme for Immunisation
ERU	Emergency Response Units
EWS	Early Warning System
FACT	Field Assessment and Coordination Teams
FBC	Food Basket Calculator
FDCs	Fixed Dose Combinations
FEFO	First Expiry, First Out
FFW	Food for Work
FGM	Female Genital Mutilation
GM	Growth Monitoring
FP	Family Planning
FTE	Full-time Equivalent
GFR	General Food Ration
GIT	Gastro Intestinal Tract
HAART	Highly Active Antiretroviral Therapy against HIV/AIDS
HAC	Humanitarian Action in Crisis/WHO
HBV	Hepatitis B Virus
HEICS	Emergency Incident Command System
HIS	Health Information System

Acronyms Abbreviations

Term	Definition
HIT	Health Information Team
HIV	Human Immunodeficiency Virus
HLS	Humanitarian Logistics System
HPV	Human Papilloma Virus
IAEA	International Atomic Energy Commission
IAPSO	Inter Agency Purchasing and Supply Organization (UN)
IASC	Inter-Agency Standing Committee
IATA	International Air Transport Association
IAWG	Inter Agency Working Group
ICC	Interagency Coordinating Committee (MoH/EPI)
ICD	International Classification of Diseases
IDU	Intravenous Drug Users
ICG	Interagency Coordinating Group (WHO/meningitis)
ICRC	International Committee of the Red Cross
ICU	Intensive Care Unit
ICVA	International Council of Voluntary Agencies
IDU	Intravenous Drug Users
IDP	Internally Displaced Person
IEC	Information Education and Communication
IEHK	Interagency Health Kit
IGO	Inter-Governmental Organisation
IHL	International Humanitarian Law
IMC	International Medical Corps
IMCI	Integrated Management of Child Health
INGO	International Non Governmental Organisation
IPI	Intermittent Presumptive Treatment (malaria)
IPT	Intermittent Preventive Therapy
IRS	Indoor Residual Spraying
ISO	International Organisation for Standardisation
IT	Information Technology

Term	Definition
ITNs	Insecticide Treated Nets
ITMs	Treated Mosquito Materials
IUATLD	International Union Against TB and Lung Diseases
IUD	Intra Uterine Device
IV	Intra Venous (inj)
KAP	Knowledge, Attitude and Practice
LAM	Lactational Amenorrhea Method
LBRF	Louse-Borne Relapsing Fever
LLINs	Long-Lasting Insecticisal Nets
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MCI	Mass Casualty Incident
MCM	Mass Casualty Management
MDG	Millennium Development Goals
MDR	Malaria Death Rate
MDR-TB	Multi-drug resistant therapy
MERLIN	UK based NGO
MISP	Minimum Initial Service Package
MMR	Mass Miniature Radiography
MoH	Ministry of Health
MoU	Memorandum of Understanding
MSF	Médicins Sans Frontières
MTCT	Mother To Child Transmission (of HIV)
MUAC	Mid-Upper-Arm-Circumference
MVA	Manual vacuum aspiration
NEHK	New Emergency Health Kit (WHO)
NGHAs	Non-Governmental Humanitarian Agencies
NGO	Non Governmental Organisation
NS	National Society (Red Cross/Red Crescent)
NTUs	Nephelometric Turbidity Units

Term	Definition
OI	Opportunistic Infection
OPV	Oral Polio Vaccine
ORS	Oral Rehydration Salt/Solution
ORT	Oral Rehydration Therapy
OVC	Orphans and other children made vulnerable by HIV/AIDS
PAHO	Pan American Health Organisation
PEM	Protein Energy Malnutrition
PFA	Psychological First Aid
PH	Public Health
PHAST	Participatory Hygiene and Sanitation Transformation
PHC	Primary Health Care
PHN	Public Health Nurse
PLHIV	People Living With HIV
PMTCT	Preventing Mother to Child Transmission of HIV/AIDS
PNC	Post-Natal Care
PSF	Pharmaciens Sans Frontières
PSP	Psycho-social Support Programme
PTCT	Parent To Child Transmission
PTSD	Post Traumatic Stress Disorder
PV	Per Vaginam
QMP	Quality Management Programme (blood)
QMT	Quality Management Training (blood)
RC/RC	Red Cross/ Red Crescent
RDRT	Regional Disaster Response Teams
RDT	Rapid Diagnostic Tests (for malaria)
RH	Reproductive Health
RHA	Rapid Health Assessment
DHF	Dengue Haemorrhagic Fever
RHRC	Reproductive Health Response in Conflict Consortium
RR	Relative risk

Term	Definition
R&R	Rest and Recuperation
RRN	Relief and Rehabilitation Network
RVF	Rift Valley Fever
SAR	Search and Rescue
SAVE	Secondary Assessment of Victim Endpoint
Sd	S. dysenteriae
SF	Supplementary Feeding
SFP	Supplementary Feeding Programme
SGBV	Sexual Gender Based Violence
SMART	Standardised Monitoring of Relief and Transitions
SOP	Standard Operational Procedure
SP	Sulfadoxine-Pyrimethamine
Sphere	Humanitarian Charter and Minimum Standards in Health Services (the Sphere Project) Technical Standards
START	Simple Triage and Rapid Treatment
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
SWOT	Strengths, Weaknesses, and Opportunities and Threat (analysis)
TALC	Teaching Aids at Low Cost
TALL	Technology Assisted Lifelong Learning
TB	Tuberculosis
TBA	Traditional Birth Attendant
TDR	Programme for Research and Training in Tropical Diseases
TFC	Therapeutic Feeding Centre
TFP	Therapeutic Feeding Programme
ThCMV	Therapeutic vitamins and minerals
TLC	Total Lymphocyte Count
TT	Tetanus Toxiod
U5MR	Under-Five Mortality Rate
UNHCR	United Nation High Commissioner for Refugees

Acronyms
Abbreviations

Acronyms Abbreviations

Term	Definition
UNICEF	United Nation Children's Fund
UNV	United Nations Volunteer
USAID	United States Agency for International Development
USCR	United States Committee for Refugees
UTC	Universal Time Co-ordinated
VCA	Vulnerability Capacity Assessment (International Federation)
VCT	Voluntary Counselling and Testing
VHFs	Viral Hemorrhagic Fevers
VWSC	Village Water and Sanitation Committee
WFH	Weight-For-Height
WFP	World Food Programme
WHO	World Health Organisation
WHO/AFRO	World Health Organization Africa Regional Office
WHO/EHA	WHO, Emergency and Humanitarian Action
WMA	World Medical Association
WMD	Weapons of Mass Destruction
WMMR	Weekly Morbidity and Mortality Report
WSM	World Swim for Malaria
WTO	World Trade Organisation
XDR-TB	Extensive drug resistant therapy

Bangladesh – Photo: International Federation

Introduction

Thinking about disasters

Disasters make news and we are seldom unaware of an impending disaster, an actual event or the on-going recovery from a disaster anywhere in the world. Not only does the ever-expanding media coverage make us aware more quickly of disasters, but the numbers of disasters and those affected by disasters are also on the increase.

Economic growth is strongest in costal areas, encouraging migration from rural areas and urbanization. Many of the new migrants live in substandard housing, often in hazard-prone areas. Governments bent on economic growth have ignored environmental concerns resulting in deforestation, unregulated housing construction and the construction of roads without considering the consequences.[1]

In some regions, the engine of much economic growth is cheap labour working in weakly regulated manufacturing industries. Not only does this pose human rights and public health concerns for the workforce, but many potential hazardous processes with toxic substances are now interspersed within residential areas. The nature and the risks of these industrial hazards are seldom appreciated or mapped by local authorities.

This economic development also brings greatly increased mobility. Transportation safety does not receive adequate attention, both in the rapidly expanding air transport sector, as well for travel by road.

Looking ahead, the prospect is also for more violent conflicts. Conflict is the ultimate disaster which can befall a population. Not only is it a disaster because of the death and destruction of livelihoods that it brings, but also for the serious economic impact that it has on neighbouring countries. Whereas in the Cold War era these conflicts were about ideology, now conflicts are about the control of resources, oil and water in particular. With increasingly destructive weapons available, the human cost of conflicts will most certainly rise. Protecting civilians caught up in conflict is already becoming a dangerous task. While halting violence requires political will and experienced negotiators, humanitarian agencies can play important roles in helping to manage the conflicts that give rise to violence through a rights-based approach to meeting the needs of those excluded or at the margins of society. Further, humanitarian organizations have a major post-conflict role to play in the restoration of services in the social sector and in rebuilding the fabric of society.

Disaster management

In the popular view, managing disasters is about the response to disaster. However, this is but a corner of the picture. Low income countries have many fragilities which increase the risks surrounding various hazards. A disaster plan or a disaster response that does not consider the development needs of a population is inadequate. Such short-term thinking does little to reduce the vulnerability of a population. Organizations which respond both to emergency needs as well as disaster needs have a potential advantage as they can take a long focus in helping to mitigate disaster affects and prepare populations to better cope with future events.

The management of disasters must include all the disaster phases. Without good preparation, even a disaster response with unlimited resources may have only short-term effects. Vulnerabilities must be identified, plans and policies developed, measures established to mitigate disaster consequences and to identify, train and keep teams in good form. Of even greater importance, the communities at risk must themselves be

prepared to cope with emergencies. This is a long-term undertaking which requires the dedication and coordination of many individuals and organizations.

Disaster planning

In low-income countries, planning for disasters has not kept pace with population growth and expansion of economies. Central governments are responsible for the safety and health of their populations. Creating disaster legislation, a body responsible for disaster management and a unit to coordinate disaster response are basic steps. Beyond the organizational structure, disaster management units must have connections through the various line ministries which play a role in response to any national disaster. Other bodies such as non-governmental organizations (NGOs) and the national Red Cross or Red Crescent society should participate in planning activities.

At regional, provincial or state levels, a structure which mirrors the national level structure needs to be in place. Again, this needs to be closely connected to governmental functions as well as linked to NGO and voluntary society groups. In an emergency, this level may have the primary responsibility in coordinating an emergency response. A major role is the supervision and support of disaster management capacity at the municipal and community level.

Saving lives in a disaster usually comes through efforts of the people in affected communities. It is at this level that voluntary associations and NGOs are the strongest. Communities that have learned the correct responses to earthquakes, floods and other emergencies are clearly at an advantage. Often national disaster response activities fail to include communities in their planning, crippling the initial response when disasters do happen.

At all levels, a constant reviewing of plans, practices and simulations is needed to be sure that those with the responsibility for disaster management are always fully prepared. This is probably the hardest part of any national disaster program to manage on a consistent basis. Sometimes, when a disaster does occur, the plan that some team did at a point in the past is somewhere, but responders do not know the content and are even less able to implement the activities.

Handbook for emergencies content overview

The second edition of this popular text sets out in 10 chapters key public health principles for managing disasters in developing countries. This is a thorough revision of the first edition published in 2001. For this updated edition, the focus has shifted more toward planning for relief activities in the broader context of long-term development activities in middle- and low-income countries, with less emphasis specifically on refugee circumstances.

In the first chapter, the **definitions of disasters** are reviewed. Establishing definitions helps us to understand the underlying reasons why the same type of disaster may affect two populations very differently. With this information, vulnerability assessments and mitigation plans can be put into place to improve protection of populations at risk. In this chapter, the basic structure of disaster planning is set out with an emphasis on the 'all hazard's" approach. As extending disaster planning to communities is a common failing of many national plans, this topic is covered in some detail here.

In the second chapter, *Bill Weiss* and *Shaun Morris* examine how **health systems and infrastructure** are strengthened to meet the demands from emergency relief operations following the Sphere standards. This chapter, like the following chapters, emphasizes the importance of assessments as the basis for health interventions. Existing health services may be inadequate to meet needs in an emergency. Relief organizations should support local health services and seek to integrate methods and personnel where at all possible. Parallel health services for the unaffected population and for those affected by disasters

can create major difficulties with timely response and overlap must be avoided wherever possible. Creating separate standards of service, even if very reasonable standards, which are different between two populations will cause tension and conflict over time. Following a rights-based approach means that basic minimal standards of both clinical services and access to these services are provided for all.

Alex Vu and *Anjali Pant* in the third chapter examine how health systems are affected in disasters which impair the response to emergencies. This includes the strategies required, the roles of different personnel in the health system and the establishment of **emergency health services**. The basic management of a mass casualty event is outlined. Perhaps one of the most important developments in emergency management has been that of the Incident Command System. This is particularly important in low-income countries which typically have a heavily centralized command structure where implementation of command from the site of the incident can greatly improve responsiveness.

In chapter four, *Elizabeth Rowley* sets out important issues of **reproductive health care** in an emergency setting. The recognition that basic reproductive health needs were not being met in displaced populations led to creation of the Minimal Initial Service Package (MISP). As circumstances develop, this initial activity is replaced by the establishment of more comprehensive reproductive health services. Other key reproductive health activities in emergencies include antenatal services, delivery and newborn care as well as the prevention and treatment of sexually transmitted diseases. An increasing area of concern is sexual and gender-based violence. Awareness of how big this problem is and of developing suitable measurement and interventions have now made addressing these issues of violence a priority from the beginning of an emergency.

Dr Fredrick Burkle, *Pritika Chaterjee, Judith Bass and Paul Bolton* discuss in chapter five common **emergency mental health and psychosocial support**, psychosocial and emotional needs of persons affected by disasters**.** Psychosocial and mental health consequences of emergencies are common, yet are often widely ignored in the immediate response. Although their extent is now being appreciated, the lack of common assessment methods hampers development of effective assistance. The approaches now used in low-income country disasters are based on principles established in high-income countries. These have not all been fully proven to work across cultures. Understanding risk factors for emotional trauma will help target populations for early assessment and psychological 'first aid.' In every affected population there are likely to be persons with pre-existing mental illness which may have been worsened by the disaster experience and which will need continuing treatment and support.

Epidemiological measurement and surveillance methods, covered in chapter six**,** are fundamental public health tools for providing assistance in emergencies. Determining denominators, counting events and creating rates and ratios are important for establishing priorities in health services. They are also important in comparing the changes in health status with time. As *Saade Abdallah and Raj Panjabi* points out, these are key tools for investigating disease outbreaks and monitoring their control. In almost all disasters, surveys will be required to determine needs and measure changes as programs are being introduced. Understanding how to design and implement surveys with adequate sample size is a basic skill health workers should have.

Chapter seven covers the management of communicable diseases problems which are likely to occur among populations affected by disasters. Here *Saade Abdallah and Raj Panjabi* discuss the approach to identification and control. These start with the identification of the risks involved and characterization of vulnerable populations. Prevention and surveillance measures are a key part of the strategy. **Controlling communicable diseases** is an ongoing process which requires constant vigilance against new pathogens as well as diseases existing in the community. Certain diseases such as tuberculosis, meningitis and malaria, which are difficult to control in normal circumstances, become particularly hard to manage after emergencies.
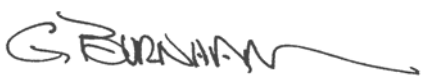
In chapter eight, the key points of **water, sanitation and hygiene in emergencies** in emergencies are covered by *Catherine Frazer*. Few factors affect the lives of those in emergency situations more than water, shelter and sanitation. Of the epidemic diseases occurring in disaster situations most are related in some way to disruptions in a population's equilibrium with the environment. Basic standards have been widely agreed upon and there is considerable evidence the implementation of these services in emergencies is effective. Prompt and vigorous attention to environmental health issues is needed to prevent elevated rates of illness and death in emergencies. Public health workers need to know the basics of controlling environmental risks and providing for human needs, even if they do not have an engineering background.

Much of the resources in many emergencies are allocated to the purchase and delivery of food. **Food and nutrition** are discussed by *June Luis-Pierre* in chapter nine**.** Without careful attention to nutritional status, illness and death rates can rise in populations displaced from their livelihoods. Measurement and monitoring of individual and population nutritional status, making decisions about therapeutic and supplementary feeding programs and establishing food distribution systems are all critical components when providing emergency services. Mortality data can be collected during nutrition surveys. Micronutrient deficiencies may occur silently unless there is adequate surveillance and awareness by policymakers of micronutrient deficiency problems. Food distribution can also affect local economies in surrounding areas, if not managed carefully. Estimating quantities, scheduling transport, storage and setting up distribution centres requires detailed understanding of the management of commodities.

In chapter ten**,** *Saade Abdallah* reviews key **management principles** for setting up programs in emergency situations. Although some would think that planning for emergencies is not possible, it is during an emergency, more than any other time that skills in planning and management are needed. The management cycle starts with an assessment and continues through problem identification, considering alternative solutions, selecting and implementing an approach and ends in evaluating and reassessing population needs and program results. Using a logical framework, or 'log frame' approach, is useful for planning and sequencing activities for the management of relief activities. This approach has now become standard for many organizations in the planning process.

Annex one and two contain the references from each of the chapters for **further reading and glossary**.

We hope this revised and updated text will continue to be of benefit to emergency management personnel worldwide and help to improve the public health services provided to populations affected by disasters.

Gilbert Burnham
Co-Director of the Center for Refugee
and Disaster Response
Johns Hopkins

Emily Christensen Rand
Project Manager and Chief Editor
Johns Hopkins

Disaster definitions

Indonesia after the earthquake that hit Jave - May 2006
(Olav A. Saltbones / International Federation of Red Cross and Red Crescent Societies)

Disaster definitions

Introduction

This chapter reviews the public health impact of disasters on populations and how the capacity of vulnerable communities can be strengthened to cope with disasters. It looks at the social, political, economic and cultural factors that create vulnerabilities. This chapter answers the question 'What is a disaster?'

Learning objectives

- To describe different types of disasters, their trends and consequences on displaced populations;
- To describe the disaster cycle of preparedness, response, reconstruction and mitigation;
- To define the factors the influence risks to a population from a hazard and steps which can minimize these risks;
- To list the major political, economic, social and cultural factors which affect the public health of a population during disasters;
- To be able to list the various levels and components of a disaster management plan;
- To define the strategies for strengthening community participation in developmental relief programmes;
- To describe the public health needs of refugees and internally displaced persons.

Key competencies

- To analyze current trends and public health consequences in large populations after disasters;
- To understand how mitigation and preparedness can reduce public health consequences of disasters;
- To recognize how humanitarian organizations can reduce populations' vulnerability to risks in disasters;
- To be able to participate effectively in the disaster management process with local and national organizations;
- To understand the critical role of community participation in disaster management programmes.

Two men walk along a broken concrete sanitation drain in Nokalat, Pakistan. Photo: Mubashir Fida/ International Federation

1

Defining a disaster

The word *disaster* implies a sudden overwhelming and unforeseen event. At the household level, a disaster could result in a major illness, death, a substantial economic or social misfortune. At the community level, it could be a flood, a fire, a collapse of buildings in an earthquake, the destruction of livelihoods, an epidemic or displacement through conflict. When occurring at district or provincial level, a large number of people can be affected. Most disasters result in the inability of those affected to cope with outside assistance. At the household level, this could mean dealing with the help from neighbours; at the national level, assistance from organizations such as the International Federation of Red Cross and Red Crescent Societies, the United Nations, various non-governmental organizations (NGOs) and government agencies themselves. As the limiting factor in disaster response is often the coping capacity of those affected, improving their resilience when responding to disasters is a key approach to lessening the consequence of a disaster.

Defining the scope of a disaster

The ruins of a housing complex in the Indonesian city of Banda Aceh three days after the disaster. Photo International Federation

There is no single measure of a disaster that can capture the full scope of a disaster. A common measure is the number of people killed or affected. The individual will consider the impact on his or her family and livelihood. Disaster managers will assess the speed and success of the disaster response. Economists will measure physical loss to houses and buildings and loss of production. Politicians will assess political damage from a poor response by state agencies. Health workers will consider the resources required to contain an outbreak of meningitis or Ebola. Others may focus on the nature of the hazard, the social consequences and the impact to specific elements of the infrastructure. To think seriously about a disaster means we must consider all affected and their losses both in the immediate and the longer term.

Classifying disasters

Natural disasters

In the minds of many, disasters are divided into those thought of as originating from forces of nature or from the effects of humans. The list of natural disasters include weather phenomena such as tropical storms, extreme heat or extreme cold, winds, floods, earthquakes, landslides and volcanic eruptions. Disasters caused by humans have included transportation accidents, industrial accidents, release of hazardous materials and the collapse of buildings. Disasters are still widely thought of as sudden onsets of cataclysmic events. However, disasters such as famine and global climate change could be considered 'slow-onset' disasters. As odd as the idea sounds, disasters can even be 'chronic' – that is: continually occurring over a protracted period of time.

In reality, although humans can do little about the causes of weather events, humans have been increasingly able to reduce the impact of weather events on society. Early warning systems can alert costal populations of approaching tsunamis and they can give populations time to be evacuated from danger areas. Zoning codes, where enforced, can keep populations from building in flood-prone areas. Responsible land use can reduce the risk of landslips caused by unchecked felling of trees.

Disaster definitions

For other events classified as natural disasters, risks can be dramatically reduced through careful planning. Construction codes when enforced can reduce loss from earthquakes. Governments can institute measures to assist in extreme cold and extreme heat. Food security programmes can protect a population against food crises arising from pests and failed crops. Surveillance systems and high coverage by routine immunization programmes can help prevent outbreaks of disease. Social programmes can reduce vulnerability to disasters which otherwise could not be controlled.

Natural hazards increased by humans

From the earliest days, disasters were often classified as acts of God or acts of man, a language which persists in the terminology of insurance companies. As society has become more complex, it is evident that people are increasingly responsible, directly or indirectly, for the consequences of events previously ascribed to forces beyond their control. Many disasters arising from natural hazards would not have occurred or would have had a smaller impact on communities had it not been for actions by people: deforestation for firewood or building materials has resulted in landslides during heavy rainfall in Central and South America; overgrazing of cattle has allowed desertification in the Sahel; uncontrolled housing construction close to beaches increases risks from tsunamis and storms: removal of wetlands has eliminated a natural mitigating factor for the damage caused by tropical storms; political systems have turned droughts into famine, particularly in Africa.

Disasters caused by humans

Though weather and geologically related disasters are considered to have generated the greatest number of deaths and economic loss, disasters generated by humans are increasing in importance. In former Soviet-bloc countries, industrial systems have left the environment heavily polluted with dangerous substances in many places. Globalization is now carrying industrial production to previously agrarian societies. The risk from the unintended release of hazardous materials is becoming ever more widespread. Potentially hazardous products are now available in communities and populations which do not have adequate regulations governing their use and, in fact, may not even be aware of their presence or health risks. Rapidly increasing transport of people and commodities across continents means that transportation disasters pose increasing threats to millions. Although effective methods to contain these threats are possible and used in many countries, others see implementing these disaster mitigation tools as contrary to short-term financial interests.

Armed conflicts, often called Complex Humanitarian Emergencies (CHEs) are the worst disaster that can befall populations. The deaths among civilians in Vietnam, the Democratic Republic of the Congo, Mozambique and Iraq are counted in hundreds of thousands and, in some cases, in millions. In violent conflicts, civilians now bear the great majority of injuries and death. The effects of conflict continue for decades, not only through the remaining landmines and displaced populations, but also through the economic consequence to the countries affected as well as their region. This is an area where perhaps disaster mitigation has been the least effective. Those states with the power to reduce these risks may have their own strategic interests in not doing so. Further, excluding warfare, repressive states inflict major loss of life on their own people.

The ready availability of weapons and munitions means that small groups with violent intents can terrorize large populations. The roots of terrorist movements are often poverty, inequity and marginalization. These roots are often forgotten in efforts to improve the security of developed countries.

1. Disasters from forces in nature
Tropical storms (hurricanes, cyclones)
Floods
Droughts
Extreme hot or cold
Volcanoes
Earthquakes
Landslides
Tsunamis

2. Disasters with humans as a factor
Mudslides from deforestation
Famine
Desertification

3. Disasters directly caused by people
Conflict
Industrial events: explosions, hazardous materials and pollution
Transportation events

The disaster cycle

Disasters are often thought of as a cycle.[5] A disaster may occur with or without a *warning phase*. A *response* is made following a disaster. The response may be helped substantially by any *preparedness* actions which were made before the disaster occurred. Relief activities occur during the emergency phase, which follows the impact of the disaster. This phase transitions into the *reconstruction*

(rehabilitation) phase. During this phase, the lessons learned are applied to *mitigating* or totally *preventing* the effects of future reoccurrences of this type of disaster and, at the same time, make preparations to respond to this type of disaster, should it return. The conceptual diagram above is helpful in planning disaster response. Its neat order suggests that one phase follows another in a clear sequential fashion, when, in fact, many things occur simultaneously. The cycle concept conceals the fact that the consequence of disasters may go on well beyond a reconstruction phase. In fragile states, there may be only minimal resources to undertake reconstruction and mitigation, with each disaster further reducing the status of the country's people. Weak efforts at reconstruction and mitigation are easily overwhelmed by subsequent disasters. The cyclic concept often breaks down when thinking about armed conflicts, where there are often false starts toward resolution and reconstruction may break down with a return to the armed conflict. Protracted conflicts create populations for whom abuse and displacement are part of their normal existence.
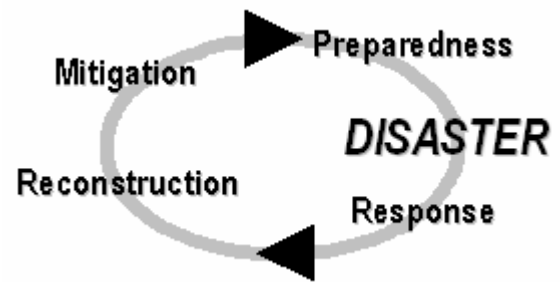
Disaster impact

Most disasters have sudden impact, though some, such as droughts and famines, are somewhat awkwardly called 'slow onset' disasters. In some cases, there may be warnings, such as weather predictions. Getting these warnings to those at risk is often difficult in developing countries. Even with warnings, there is little many people can do in the absence of disaster preparedness or adequate resources.

Alert phase, (warning phase)

Certain types of disasters can be predicted. An early warning can be issued, lessening the impact. Tropical storms are in this category, where weather satellites follow and track a disaster's build-up. Populations can be alerted to droughts and the potential for famines through the timely collection and analysis of data. Many web-based early warning systems are now available and UN, NGOs and the International Federation are using them extensively. Still further development in this area is expected as technology develops.

Response in the emergency phase

Some form of disaster response capacity is present in most countries. This may be organized through a national civil defence or emergency management agency. Military forces may take disaster response responsibilities because of their communication and logistical capacity. The Red Cross and Red Crescent National Societies are chartered in many countries to provide relief in emergencies. Civil society organizations such as non-government organizations and those associated with religious groups may be the first responders. In almost all disasters, local communities play the first and often most important role in responding by rescuing those affected, providing first aid and emergency shelter, usually long before outside organizations arrive at the scene. Building a strong volunteer group is an important disaster response asset.

Many international agencies have developed excellent disaster response capacities and they can augment local capacities in disasters. International agencies are often most successful in channelling external resources into the long-term reconstruction work in developing countries. There is a fear that resource-poor countries might abandon their own responsibilities for disaster response and recovery in order to rely mainly on international agencies. The belief that extensive external assistance following disasters causes dependency to develop has been shown not to be the case.

Reconstruction phase

In developed countries the effects of a disaster may be repaired in a short period of time, though the psychological damage among survivors may persist for years. In developing countries the reconstruction process may take years. Consensus on reconstruction policy may take time to reach, records of property ownership may be lost and official permission delayed. At the household level families may take time to decide whether to return to disaster affected areas or rebuild their lives and houses elsewhere. A rapid early response can demonstrate serious commitment to assist survivors by government, as well as promote an early return to normality which will help health psychological trauma for the disaster. Humanitarian aid organizations must think about what affect their actions will have on local governments and future disaster responses.

Mitigation

Mitigation means to take actions which will lessen a disaster's consequences and subsequent hazards. Many of these actions are an integral part of the reconstruction process. An improved design should be incorporated into the reconstruction of buildings following an earthquake or a tropical storm. Housing in marginal lands or flood plains which have been destroyed by flooding should not be reconstructed. At a time of heightened awareness following a disaster, attention should turn to other vulnerabilities and mitigation efforts should also be directed toward reducing these additional risks. Disasters expose social vulnerabilities which may predispose populations to other potential disasters: these should be addressed. Efforts at mitigation may overlap with plans to improve preparedness for the next disaster. Mitigation activities and longer term development programmes have very similar goals and can reinforce each other. Making available adequate and affordable insurance helps share risks and mitigates the potential effects on the economic devastation that might arise from future disasters.

Prevention

Some disasters can be prevented entirely. Mudslides can be prevented from happening by controlling deforestation or undertaking engineering works. Loss of life and property can be prevented by enforcing housing codes in disaster-prone areas. This requires resolute governments with strong public support to enforce such restrictions. Civic authorities seldom receive credit for disasters that never occurred through careful planning and enforcement.

Preparation for the next disaster

After every disaster, organizations involved should examine their actions to see what could be done to improve their effectiveness in responding to future disasters. 'After Action' reports are now widely done by many of the more effective agencies. The planning process, the mapping of vulnerabilities and the assessing of the shortfall in existing resources help communities and organizations to prepare. 'Chance favours the prepared mind' is the often repeated quote from Louis Pasteur. In recent years, an 'all hazard' approach to disaster planning has become popular. This approach emphasizes the common features of disaster response. Unfortunately, the training and updating of skills which are required to make disaster preparedness really effective are often not done, causing disaster preparedness to remain a false assurance. While no two disasters are the same and a subsequent one may be much different in character. The mitigation efforts

focus on and provide minimal protection. Preparation is still an important step to reducing the damage of a disaster.

Although preparedness often includes stockpiling of emergency supplies, few organizations, other than the military, can afford to do this on a large scale, give the capital costs and the costs of regular rotation of provisions.

The risk formula

The risk formula attempts to capture the various components which influence the amount of risk which a hazard may produce for a community or population. This draws on the work of Wisner, a risk scientist in London and others.[12]

$$\text{Risk} = \text{hazard} \times \text{exposure} \times \frac{\text{vulnerability}}{\text{manageability}}$$

Risk = the possibility of loss, injury, death or other consequence

The concept of risk is the basis for calculating insurance premiums: how likely or probable is it that a given event will occur and what will be the costs associated? In disaster planning it is common to speak of the frequency or probability of events such as 10-year or 50-year floods. Risk by definition is the possibility of damage to the lives of people affected. But it is also common to speak of 'elements at risk.' Such elements at risk include failure of communication and transportation systems and health services.

Hazard = a destructive phenomenon or event

This could be earthquakes, tropical storms, volcanic eruption or industrial events. In themselves, hazards are not disasters. Only when they affect populations directly or indirectly, through the destruction of crops, water sources or physical infrastructure do they become disasters. There are many rating scales for the intensity of hazards, such as storm categories, earthquake magnitude, or the height of flood waters. Hazards can be mapped ahead of time. This can give information on what land will be inundated by a tsunami of whatever height, or what areas will be covered by ash from a volcano as well as the various wind directions.

Exposure = duration and/or extent of a hazard

In earthquakes, this could be not only the duration of the tremor, but the duration of the aftershocks, some of which may be almost as severe as the original event. Exposure could mean the duration of a drought. In an armed conflict, exposure could be measured in decades of human displacement. The exposure could also be a measure of the number of people affected and even the extent to which they are left exposed. The words *exposure* and *vulnerability* may be used by some in a similar way. A local electricity generating facility may be left 'exposed' to complete or partial failure through poor engineering or a failure to prepare for potential hazards.

Vulnerability = susceptibility to damage or harm by a hazard

This captures the idea of protection and coping. For people it implies that there is exposure to the effects of a hazard which can hurt them or damage their shelter, possessions or livelihood. It suggests that, for various reasons, their ability to cope with the consequences of a hazard is limited. The extent of vulnerability depends very much not only on characteristics of the person or household, but on the nature of the hazard. Vulnerability of persons living in a substandard apartment house to a drought would differ from their vulnerability to an earthquake. Vulnerabilities to the same hazard will differ between subsistence workers and the rich. There are many forces in a society, from

geographic location to social and economic factors which affect vulnerability. Poverty is perhaps the major vulnerability of a population, yet some disasters may have an impact across all social strata.

Vulnerability can also be assessed for various services. Hospitals may be vulnerable to earthquakes, storms, power failures and flooding. Even if well protected against a hazard, health workers may not be protected, leaving health facilities and health systems unable to cope with demands after a disaster.

Like hazards, vulnerabilities to different events can be mapped. This information provides disaster managers with important information to map target vulnerability reduction strategies as well as potential assistance needs for various populations or types of services. Understanding the nature of risks and their locations in a community is a key component in a comprehensive disaster plan.

Manageability = the capacity to respond to Needs created by a Disaster

On the one hand, this measures the organizational capacity of national disaster programmes, the Red Cross/Red Crescent activities and NGOs, but also addresses the capacity within the affected communities to cope with calamities. Building the household's capacity to mitigate the effects of common disasters has been the centre piece of most disaster preparedness programmes. The extent that disasters are managed is known only after an event has been dealt with. But training, practices and drills can give some indication of how well a real disaster could be managed. Insurance, which transfers risks from the individual or business to insurers, is an important manageability tool.

Macro forces in an environment

The more obvious components for planning and managing disasters have already been listed. There are, however, many macro, often more subtle and pervasively cross-cutting forces that affect the response of populations to disasters. Some of these are listed in later sections.

Demographic forces

Disasters can trigger or encourage migration. Often, people in migration are at heightened risk. The massive outbreak of cholera in Goma (Congo) occurred among people fleeing Rwanda.[3] Epidemics themselves may cause mass migration that can counter all efforts to quarantine all epidemics. People migrating from rural to urban are particularly vulnerable unless they are established in an urban existence. Many people moving to cities are forced to settle in risky areas of land which are susceptible to flooding, fire or disease. These growing settlements around cities create pressures which can degrade the environment and further increase vulnerabilities. The uncontrolled cutting of trees for building or fuel creates the potential for landslides during rains. Even in rural areas, rising populations reduce the land per capita available for agriculture and increases social tension as in Rwanda.[5]

In many countries, aging populations are creating a new class of vulnerable groups. Where there is extensive migration because people are looking for labour or males have been killed in conflicts, new vulnerable groups are created. These may be female- or child-headed households, villages or small towns that have been emptied of their young people.

Economic and social forces

Poverty, although its effect is uneven, is the major single contributor to vulnerabilities. Subsistence farmers may be protected in one type of disaster but highly vulnerable in another. Generally speaking, those at the lower end of the economic and social scales lack the potential to control or mitigate many of the events that affect their lives. Loss and recovery from Guatemala earthquakes, or hurricane Katrina in New Orleans are well documented examples of how poverty increases vulnerability. Because the increasing disparities in living standards across nations and within countries may greatly increase vulnerabilities, these are of concern to disaster planners.[6] Hazardous materials and industrial processes that use such materials are often located in the poorer parts of urban areas. The availability of cheap labour means that basic protection of the employees and the surrounding community may not be practiced

Cultural practices in such diverse areas as land use, housing construction and traditional decision-making processes affect the ability to prepare and to respond to disasters. In societies where there is a tradition of working together to achieve community goals, these practices can help mitigate the effects of many hazards.

Rapidly expanding populations are comprised mainly of young people who will soon be looking for education and jobs. Without access to these, populations become restless and create economic tension which may cause within a country political instability. This can cross borders and have unfortunate economic consequences in neighbouring countries.

Political inclusiveness and ideology

Access to government decision-making avenues is an important method for reducing vulnerabilities. Non-representative government both locally and nationally usually lacks the capacity to respond to needs expressed by citizens. Such governments also tend to suppress the development of civil-society organizations, which are important in reducing vulnerabilities through volunteer groups and community organizations. Some political ideologies continue to discourage initiatives which do not originate within political systems. Governments may believe they 'own' disasters. Such attitudes limit their willingness to include non-governmental groups in the planning process. It also discourages individual and household initiatives which could mitigate the effects of disasters. When disasters occur and non-governmental and community groups often respond in an effective grass-roots manner, this can create resentment whenever government ineffectiveness is exposed.

As education levels in a society rise, there is often a greater willingness to take personal actions or to participate in community activities aimed at reducing risks from disasters. Much of this may be tied to a rising capacity to take control of one's own life. The low levels of education, which often go with subsistence agricultural economies, may, however, be a particular challenge to introducing those changes that could reduce disaster risks.

Armed conflicts as disasters

Of all disasters, the effects of armed conflicts are probably the greatest. After the birth of the United Nations, the number of violent conflicts between states has been diminished, but with some notable exceptions. Instead, the majority of conflicts have been within states. During the Cold War, these were often 'proxy wars'
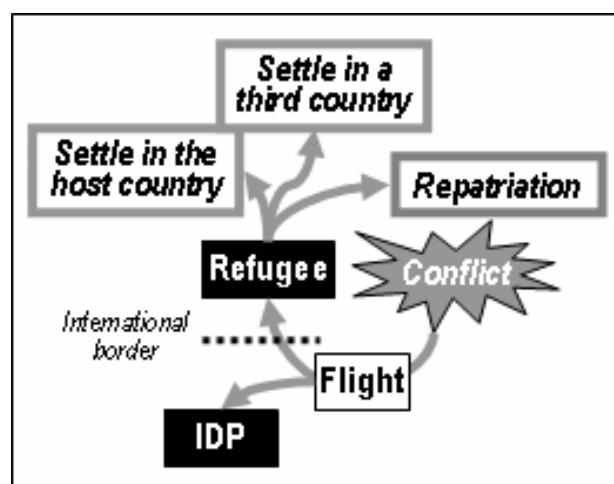
fought generally by two parties, each aligned with one of the two superpowers. Almost all of these occurred in the world's least developed countries. Since the end of the Cold war internal conflicts tend to have multiple warring factions, making resolution more difficult. Consequentially, the numbers of refugees and internally displaced persons (IDPs) have reached at least 30 million throughout the past decade. Among all disasters, some of the largest public health challenges are those associated with the care of persons displaced by conflict.

A refugee was defined in 1951 as a person outside his or her country of origin and unwilling to return because of a well-founded fear of persecution over race, religion, nationality or membership in a social group or political opinion[8]. An additional component is the unwillingness to return because of a threat to life or security as a result of armed conflict or wide-spread violence which seriously disturbs public order.

Though having the same fears and suffering the same threats, because some people might not cross an international border, they are, therefore, not considered as refugees, but IDPs. This difference is very important because there are no UN protection mandates covering IDPs. Also, the international funding to assist them is but a fraction of that available for refugees. An additional group, sometimes called the 'internally stranded' are those who would flee if they could, but are trapped. This group is highly vulnerable to violence, much of which is neither witnessed nor documented.

Refugee crises are generally divided into three phases. The **emergency phase** usually occurs at the start of a refugee influx and is defined by a death rate twice the baseline crude (all-cause) death rate for that group. At this point, displaced populations are particularly vulnerable to outbreaks of disease, malnutrition and environmental hazards. Putting public health measures into place rapidly to minimize excess mortality is a major challenge in the emergency phase. The **post-emergency phas**e begins when that death rate drops back below twice the normal or background rate. Often, this is considered a maintenance phase as refugees wait for conditions to be right for repatriation. This is a time to build good health knowledge and community practices during the protracted waiting which often occurs. The lack of political will sometimes causes refugees being totally reliant on humanitarian aid to remain in camp-like situations for decades. This has lead to campaigns by some against the practice of 'warehousing' refugees in dependent situations.[10] Finally in the **repatriation phase**, refugees return home. This is often termed the 'durable solution' when refugees settle permanently in their host country, move to a new country or return to their homes. Obviously, only the latter option is available to IDPs. Often, the displaced return home to shattered and depleted circumstances, requiring continuing assistance until they are firmly re-established in their communities.

Refugees might be housed in camps, be self-settled or live with a host family. Camps for displaced populations are a management convenience. There is evidence from many situations that self-settled refugees do better in many respects than those in camps. High death rates are usually due to the poor access to public health resources such as water, sanitation, food, shelter and health services. However, these are difficult to establish in the absence of a secure environment.

Disaster summary

Disasters are complex events that defy simple explanations. No two disasters are the same, yet they all have similarities in human suffering and material loss. In addition, there are some basic actions which can mitigate the impact of future disasters. Increasingly, disasters arise from human actions. Some of these are based on economic activities needed for survival, but many are based on exploitation for short-term gain without any serious consideration of longer term alternatives.

Few developing countries have yet to implement effective national disaster management systems. Without these, developing nations remain dependent on international organizations to provide assistance in times of disaster.

Armed conflict has the greatest impact of all types of disasters on people. Yet prevention of conflict attracts little interest from political leaders and policy makers compared with the time and resources spent on defence and the waging of war. From the public health standpoint, the measures developed in the past decade have dramatically reduced illness and death among the displaced.[7] Yet, the public health community has met only indifference whenever it advocates for the prevention or resolution of conflict through non-violent means.

Managing disasters

Many people still think of disasters as 'accidents' or events which cannot be anticipated. This results in a focus on responding to the immediate needs created by a disaster rather than preventing or reducing effects. Disaster *management* conveys the important idea that protecting populations and property also involves the estimation of risks, preparation, activities which will mitigate the consequences of predictable hazards and post-disaster reconstruction in a way that will decrease vulnerabilities. An important goal is building a culture of awareness that preparation is not only possible, but also will greatly reduce the consequences from disasters in terms of human and economic loss. In these, public health is an important partner with engineers, planners, elected leaders and community organizations.

An effective response to disaster begins with effective planning, but must include many other steps. Each of these steps depends on the strength of other links in the disaster management chain. While no one organization or group 'owns' a disaster, the ultimate responsibility rests with governments to protect its people against disaster. No government can carry out these responsibilities without cooperating with many other groups in a country. An effective national disaster management system is largely absent from many developing countries. In some countries, disaster response has by default devolved to the military, which often has the best communication and logistic systems. However, militaries do not generally coordinate well with other organizations that function in different ways. Militaries lack the mandate or the expertise for effective disaster planning. In some countries where floods or droughts are common, national agencies have been created to deal specifically with these disasters. However, increasingly an 'all hazard' approach is being used, which emphasizes common features in managing a response to disasters rather than focusing just on specific types of disasters such as tsunamis or earthquakes. This 'all hazard' approach exceeds the scope of drought and famine agencies. In this approach, disaster commonalities are stressed with specific annexes setting out the management for specific disasters where responses differ.

Improving resilience to disasters

Many efforts have contributed to the ability to manage the consequence of disasters more effectively by building better resilience among governments and their citizens. Among these have been the UN International Decade for Natural Disaster Reduction,[14] the Yokohama strategy,[15] the International Strategy for Disaster Reduction and its Hyogo framework[16] and the extensive work in Disaster preparedness by PAHO[17] and ADPC.[18] These have greatly advanced knowledge on effective approaches to mitigate the effects of disasters and support communities in coping with disaster consequences. The Hyogo framework focuses on building national and community resilience to disasters.[19] It outlines three strategic goals: the

- Introduction of disaster risk reduction into planning for sustaining development at national and local levels;
- Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards;
- Systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.

Disaster management planning is often seen as a separate activity from the main functions of governments and organizations. A challenge has been to integrate disaster reduction approaches into all activities. This means having legislative provisions which are current, disaster 'desks' in line with ministries, operational links to civil society organizations such as Red Cross/Red Crescent National Societies and to work actively with commercial sectors which are part of prevention activities or which would be involved in disaster response. As efforts continue to strengthen community services as part of poverty alleviation or sector-wide approaches, building community resilience must be incorporated.

Data is critical to reducing risks and improving response. Mapping vulnerabilities and resources and understanding historical patterns of disasters are key elements in coping with disasters. Surveillance systems that both identify risks and monitor needs and the adequacy of response to a disaster are indispensable, though often poorly resourced parts of disaster management. Reducing risks also means strengthening surveillance to provide early warning about public health threats and building preparedness to meet them. The use and exchange of information among disaster managers is critical for building a comprehensive and coordinated management capacity at national as well as local levels.

At the heart of any approach to minimizing loss and improving resilience is the reduction of underlying risks. This requires a comprehensive approach which includes environmental management, improving food security, protection of critical public facilities, land and building code enforcement and protecting livelihoods.

National level disaster management

Where a national disaster management agency has been established, responsibility is often located in the office of the president, prime minister or a minister with cabinet-level presence. Being a government auxiliary, Red Cross/Red Crescent is often a member of a national disaster management agency. The responsibilities for disaster management need to be set out in enabling legislation. A national council or committee with a secretariat is often set up to involve all organizations that can contribute to a country's disaster management. Typically, this includes various ministries, non-governmental organizations both local and international which jointly oversee the development of national disaster plans and monitors their use. Each of the component organizations will develop its own planning process to support its role in national disaster management. A disaster command centre is often housed by the secretariat to manage disaster response.

While national disaster planning is important, the people of a country will have little benefit without supporting organizations at regional, state, district, county, municipal and community levels. Groups at the community or local government level are the groups which actually provide help to affected populations to prepare and respond to emergencies. Where national systems exist, these groups have often not followed up in the development of strong community components. Consequently when disaster strikes, the community response will lack the coordination and the training necessary to provide the life-saving response needed. In the absence of a national disaster management system, civil society organizations such as the Red Cross and Red Crescent and NGOs have developed their own disaster response capacity which can help populations in times of disaster.

Even where national planning is largely absent, effective planning at the province, state, district and municipal levels can protect people and their property. Organizations with an extensive presence already at the community level are probably in the best position to help communities both prepare for disasters and respond when they occur. The development of community plans based on the participatory appraisal of risks, strengths and vulnerabilities to various hazards offers the best strategy to mitigate disasters at the community level.

Often overlooked is the importance for key services such as health facilities and communication bodies to have their own disaster plan. Ministerial, national or regional

disaster planning bodies can help health units, local organizations and agencies develop their own disaster plan.

The failure to update, train and practice implementing disaster plans can mean that all the effort put into planning is largely wasted. When the disaster occurs, those involved in planning have often moved to other jobs, telephone numbers have changed and few remember what actually had to be done. All that is left for the many hours spent preparing a disaster plan's substantial efforts is a forgotten set of paper plans. At the national level it is critical that readiness be assessed regularly through a variety of approaches, and that the same standard is required of regional and local disaster

Finally, all disaster management efforts need both human and financial resources. From the beginning, it is important that a disaster plan has set aside for it the resources to develop further planning; from its required committees and workshops, to the training and practices and then to maintain the reserves necessary to mount a disaster response effort at any time of need. In the event of a disaster, there is likely to be a great need for the rapid deployment of resources, which itself requires extensive planning and collaboration between organizations.

Local level disaster management

More than three million people became homeless after the earthquake. Photo International Federation

Public health practitioners, members of NGOs and of community based organizations are most frequently asked to take part in disaster management at the local and community level. This will be considered in greater detail here.

The local and especially the community planning for disasters is often the weak link in the organization of a country's disaster management system. Yet, a quick and robust community response is the key to saving lives and property. NGOs, the International Red Cross and Red Crescent Movement and various Community Based Organizations (CBOs) with strong links to the community are key partners in local disaster planning. Often these organizations are the key responders where other resources are limited. Such organizations heavily depend on volunteer or part time staff, often with high turnover. This makes the need for regular training and communication most important.

A typical local or community disaster response plan contains certain key components. These are considered in the sections below. As plans are constructed for specific communities, components may differ in nature or emphasis from the typical format.

Organization of a local response

The first stage is identifying who is responsible for disaster management in the specific administrative unit or local government area. Usually, the person responsible will be a senior administrative or elected official, but supported by a disaster management committee or board. Roles and responsibilities need to be set out as well as organizational communication and supervision. This needs to be consistent with whatever national legislation governs disaster management in the country.

Disaster
definitions

Disaster management committee or board

This disaster committee contains persons responsible for public safety such as administrative, public works, police, fire, communication, finance personnel and often a judge or magistrate. In addition to the public sector, the disaster management committee should contain persons from NGOs, community based organizations and organizations such as Red Cross and Red Crescent National Societies which have the disaster management capacity. The disaster management committee has the overall responsibility of preparing, updating or modifying the disaster plan for the area in its responsibility. Further it is responsible to be sure the preparations are in place and to take action whenever weak parts of a potential response are identified. Through its members, community resources are brought into the disaster management capacity. When disaster strikes, these communication and coordination linkages may to a large degree determine the success of the response.

Implementation plan

The implementation component addresses how the disaster plan will be put into place. This component contains timelines, resources and persons responsible. It identifies resources, conducts situational analyses, maps vulnerabilities and sets out a training plan.

Community profile

The local community description includes its population and their geographic distribution, social and economic characteristics, weather patterns, and rivers. Roads, communications and utilities should also be mapped.

Community resources

Community resources which could provide assistance in disasters are each inventoried and mapped. The maps should include shelters, warehouses, energy sources, community organizations, fire and police stations, financial institutions and health and education facilities. Resources also include community organizations or groups which can effectively participate in disaster management at the household level. Key contact personnel from various organizations and from each population area are identified with contact numbers. This part of the plan must be updated regularly as it is likely to outdate quickly whenever people's positions change.

Hazard analysis

This section gathers information from assessments and local information to identify what hazards are likely to affect the community. These could be cyclones, floods, excessive heat, fires, transportation accidents, earthquake, industrial events or other hazards, depending on the location and characteristics of the community. A historical table can be constructed to indicate when these occurred and list their consequences for the local community. An annual calendar is often developed to show which various events might be expected in which months. For each of the likely hazards identified, an assessment of potential impact and vulnerable areas is made. In some cases, the geographic areas of vulnerability may be mapped, but in other cases the vulnerabilities are listed. This would include population groups, elements and services at risk. For populations, it could include groups such as the elderly, lower economic groups or people living in flood-prone or isolated areas. Elements or infrastructure at risk could include livestock, water sources, health facilities, roads and communication structures.

Prevention plan

Although the effects of many disasters can be mitigated, some can be prevented completely. Careful analysis of potential hazards can be used to stop future disasters before they start. At the community level, housing can be restricted in flood planes,

earthquake or fire resistant building codes can be strictly enforced and hazardous materials stored away from residential areas. At the household level, fire risks can be eliminated, first aid and safety supplies stocked and a household evacuation plan established.

Mitigation plan

A mitigation plan is often divided into various sectors such as infrastructure, health, communications, livelihoods, agriculture, etc. For each sector, mitigation measures are listed, and identification of responsible or 'nodal' persons for disaster management activities. This would also include making people aware of alternate roads in case of flooding, maintenance of standby power sources, protecting windows, stockpiling of essential medications, keeping emergency shelters and blankets available in certain seasons and ensuring the availability and function of emergency communication systems. The longer-term mitigation efforts would include improving building codes, safe locations for new residential areas, emergency communication systems, cross-training of potential responders.

Schedule of essential preparedness activities

From the time when a potential hazard has been identified, certain preparedness actions should begin. These can be designated ahead of time in a standing schedule of preparedness activities. For any emergency, a chain of responsibility must be established starting with who decides on when an alert is announced and how this alert is disseminated. Once an alert is announced, a specified chain of activities needs to be carried out. Among such actions could be the deployment of field staff, coordination with NGOs and Red Cross and Red Crescent National Societies, notifying vulnerable populations, the placement of emergency transportation and organizing health personnel for emergency response.

Standard Operating Procedure (SOP) for crisis response

No matter how much preparedness has taken place, a disaster system is judged mainly by its response. A Standard Operating Procedure (SOP) is created for the disaster control site which will set out roles and specific actions to be taken when a disaster occurs. This SOP can be used as the basis of drills and exercises. The SOP lists specific actions needed to prepare, to alert and to respond. Among the items included are a standard disaster assessment instrument, a register of messages and dispatch of vehicles and personnel. An important part of any response is the coordination and linkages with other organizations which will play a part in assisting the populations affected.

Criteria are established in advance covering such areas as evacuation, transportation, the location of emergency shelters, surveillance for disease outbreaks and triage of injured persons. The SOP specifies the responsibilities for making these decisions and overseeing their implementation.

Post-disaster analysis

The most important time for learning from a disaster response is while the events are fresh in the minds of those affected and those involved in the response. An organized evaluation of what went well, what failed and gaps in the response must be conducted immediately after the disaster. From this information the disaster management approach can be strengthened to prepare for the next disaster. Putting disaster lessons in place takes it a long process, involving many people. Reducing vulnerabilities may include changes in construction codes, altering road locations, strengthening utilities and many other actions which can be costly and touch political sensitivities. Disasters managers need to be persistent and patient to see that the changes needed are made.

Disaster
definitions

Strategies for involving communities

Non-governmental organizations and the Red Cross and Red Crescent National Societies have effective links with communities which governments seldom achieve. Often Red Cross and Red Crescent National Societies are part of the national disaster response agency, carrying out complementary preparedness and response work. Using these advantages to mobilize and facilitate communities to respond to disasters can help blunt the effects of many disasters. This section looks at methods to assist communities in managing disasters.

Affected individuals and communities are often treated as dependent and passive recipients of externally imposed programmes. Yet many problems of survival and health that result from a disaster may be handled more efficiently if a community is well organised.[13] Evidence shows that community participation *before*, *during,* and *after* a disaster can greatly reduce the overall mortality as well as improve the use of resources in the following ways:

- If a community is in a state of preparedness before a disaster strikes, this may reduce the impact of the disaster with regard to the number of injuries and deaths, damage to infrastructure, loss of property or livelihood;

- Whatever the type of disaster, the greatest number of lives can be saved during the first few hours following a disaster before help from the outside arrives which can take several hours or days. The local community must, therefore, be ready to assist since they may only have themselves to rely on;

- Most health and survival problems can be handled by the community. This is possible if the community is active and sufficiently organized to sustain itself until outside help arrives.

Steps in building community participation

Disaster preparedness programmes that are planned with the community are more likely to secure their long-term support and resources. To ensure the disaster preparedness programme addresses the concerns of the community rather than only those of donors, there are several methods, discussed below, that can be used to help motivate the community, analyse past experience, assess risk and start action.

Community motivation

There may be a general lack of interest in disaster preparedness among political leaders and communities. This lethargy will make it difficult for the emergency manager to engage the community in disaster preparedness activities. The following reaction may be observed in communities frequently faced with catastrophic events:

> **People living in hazardous areas or who are frequently exposed to hazards are observed to have attitudes of marked indifference. They tend not to worry about the coming earthquake, flood, hurricane or disease epidemic until it happens. Believing they have little control over such events, they tend to be fatalistic about the impact of any catastrophe.[4]**

Depending on the resources available, at-risk communities may be motivated to participate in disaster preparedness through the following ways:

- Organize informal meetings and events to improve the relationship between citizens and their local, regional, and national public officials;
- Build the community's pride by broadcasting their achievements through the local media (newspapers, radio and television reporters);

- Explore both traditional and modern techniques of reducing the risks posed by local hazards and how to cope with disasters;
- Involve vulnerable groups from disaster-prone areas (e.g., women and minority groups). They can help monitor changes in weather, water levels, food prices and availability, etc;
- Respond appropriately to disaster warnings from the community such as making investigations, taking preventive measures, etc;
- Offer to train volunteers and other members involved in rescue work, communications, transportation, construction of shelters and food supply.

Several members of the community may be interested in supporting disaster preparedness activities, including people from:

- Emergency services and law enforcement;
- Public and private health services;
- First aid and volunteer groups, such as the Red Cross and Red Crescent or from churches, mosques, etc;
- Community and professional associations;
- The business sector, trade, construction, etc;
- School teachers and school children;
- Women and youth groups.

Analysis of past experiences

The emergency services staff, local health personnel and members of the community concerned should form a disaster committee and analyze the key problems that arose during past disasters. This will help determine the priorities for future disaster response. Thereafter, action plans can be drawn based on available resources and combining both modern and traditional methods. The following table lists questions to analyze a community's disaster experiences.

Table 1-1: Analysing the disaster experience[6]

Questions to help analyse a community's disaster experiences
1. What were the principal causes of damage to infrastructure such as roads electricity and water as well as buildings and houses?
2. What were the main causes of illness and death in disaster victims?
3. What were the main difficulties in providing relief?
4. What problems arose soon after the disaster (by hours and days)?
5. Would it have been possible to predict the disaster before it occurred?
6. What preparedness measures could have limited the numbers of victims and the damage?
7. What errors were made that must never be repeated?
8. What actions did the most good?
9. What equipment and supplies were lacking?
10. What problems were encountered when transferring the injured to hospitals or clinics?
11. What were the difficulties of co-ordinating with the authorities and other community groups?
12. Would it have been possible to get better co-operation from volunteers?
13. How would it have been possible to obtain more effective outside assistance?
14. What health problems arose after the disaster and what were the difficulties of coping with them?

Risk assessment

A detailed risk assessment should be carried out by the community disaster committee led by a local leader. This involves gathering information about the risks that a community is most concerned about such as fires, collapse of buildings, floods, contamination of water sources, etc. The committee should physically walk through the entire disaster location and help community groups, local organizations, industry workers, merchants, teachers and other knowledgeable individuals to identify potential risks. The emergency response services and public health workers can help concerned people recognize factors that make the risk more acute during a disaster such as the neglect of building codes and the inadequate protection of water sources etc. The table below lists some of the questions that should be answered during a risk assessment.

Table 1-2: Assessing risk

Questions to help in risk assessment
1. What common hazards are likely to affect the area?
2. What and who will be at the highest risk from these events?
3. What are the key factors that make them more vulnerable to these hazards?
4. Which subgroups of the local population are likely to suffer more from their vulnerabilities?
5. What resources and capacities are available locally that can enable the community to respond effectively in times of disaster?

The community disaster team can follow the steps below to assess the risks and the resources that need to be addressed:

- Meet and discuss the risks the committee wishes to concern itself with;
- Conduct visits to those sites exposed to risk and carry out informational meetings;
- Clearly identify risks in writing and locate them on a risk map;
- Have risk maps reviewed by experts and committees made up of emergency service workers, local government leaders and other members of the community;
- List the resources available to the community in case of disaster;
- Propose actions to reduce the risks;
- Carry out efforts with the co-operation of the community to reduce the risks;
- Following the risk assessment, the committee can draw risk maps to summarise their findings and conclusions.

Disaster preparedness and risk reduction. Reading up on disaster preparedness; a lesson in survival.
Photo: Amalia Soemantri/International Federation

Figure 1-1: Example of a risk map
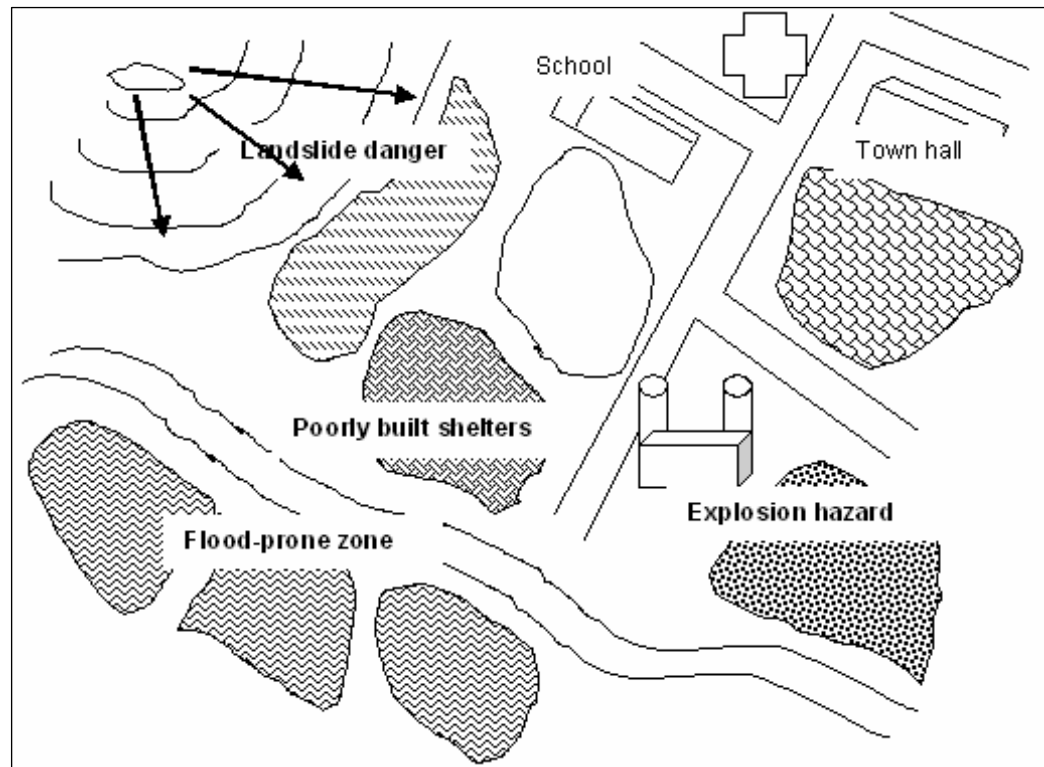
Risk maps can serve as useful tools for educating the community on the risks of hazards and for identifying the appropriate preventive actions that can reduce the impact of particular disasters. Risk maps can also be used for monitoring the high-risk sites during a disaster, and for organising relief priorities more effectively. Possible results from risk maps include the following:

- Strengthening inadequate shelters;
- Identifying places that can provide temporary protection against floods;
- Planning evacuation routes in the event of a fire.

Community action

Past experiences with disasters show that most people who are struck by disasters react in a positive way. Communities are frequently willing to volunteer for the following types of activities:

- Warning people of danger;
- Searching for and rescuing victims;
- Giving food and shelter to the homeless;
- Constructing dams or dikes to eliminate flooding;
- Safely disposing of hazardous materials.[9]

Even in the absence of specific disaster preparedness activities, communities and emergency response services operate better if they have some basic knowledge and skills in certain areas. It is important to carry out drills and practice other basic disaster preparedness exercises in areas that can improve the victims' survival and health, such as:

- Chlorinating water and distributing food;
- Setting up temporary shelters and sanitation;
- Performing first aid;
- Transporting the sick and injured to hospitals.
- Reporting critical information by telephone, radio etc;
- Dealing with stray or dead animals.

When a population is threatened by a disaster such as flooding, cyclones, tidal waves, volcanic eruptions or open conflict, evacuation may be necessary. It is important that the community takes part in determining its own evacuation routes and plans, its means of transportation, its next destination and how to access basic supplies. Every member of the community should be made familiar with these plans so that evacuating people can go as smoothly as possible.

Conclusions on community participation

Communities overpowered by a major disaster such as earthquake, flood or fire etc, usually require long-term assistance from national or international levels to recover and resume their normal lives. Introducing the disaster-prone community to practical disaster preparedness activities can build their capacity to cope with future disasters. This can be done by analysing past experiences, conducting risk assessments and creating disaster preparedness plans. Also, a well-organised community can help to improve the quality of external assistance and avoid common mistakes, such as inappropriate aid due to a lack of information about the external resources needed. The emotional trauma from disasters can persist for a long time, perhaps even a lifetime. However, returning to normal life as soon as possible helps people to function better than if the return is protracted.

Bangladesh - Community disaster preparedness

As a result of capacity-building work and increased awareness of disaster preparedness at a community level, the villagers have taken pro-active steps to strengthen their capacity and resilience when facing natural disasters. The community has come together to build bamboo bridges. The bridges help evacuate the most vulnerable people during disasters such as

Health systems and infrastructure

Treguine Chad, Refugee Camp Health centre
Photo: Daniel Cima/International Federation of Red Cross and Red Crescent Societies

Health systems and infrastructure

Description

This chapter provides guidance for strengthening local health systems and infrastructure during emergency relief operations. It not only complements, but also reinforces the Humanitarian Charter and Minimum Standards in Health Services, also know as the Sphere Project. The Sphere Project is a collaboration of humanitarian NGOs and the International Red Cross and Red Crescent Movement who joined together to create a handbook that establishes quality standards for humanitarian action. This chapter provides additional information and guidance—and reinforces key points—about the Sphere standards regarding Health Services.

Learning objectives

- To reinforce Sphere Project standards for health services;
- To clarify the tasks required to meet Sphere Project standards that are too often implied but never directly stated; and
- To provide additional guidance, tools and references to accomplish key tasks.

Key competencies

- To describe Sphere Project standards that support health services during emergency operations;
- To be able to state and carry out the required key tasks to meet Sphere Project standards. Some tasks might require humanitarian workers to carry out additional technical support; and
- To identify and obtain additional resources for accomplishing key tasks.

Acknowledgements

With the Sphere Project's permission, its standards for health systems and infrastructure and much of its guidance included in this chapter.[27] This is done to:

- Reinforce the standards;
- Provide an outline or structure for clarifying key tasks; and
- Provide as a starting point additional information to accomplish key tasks.

Introduction

The chapter's purpose

According to the Sphere Project, 'the primary goal of humanitarian response to disasters are to: 1) prevent and reduce excess mortality and morbidity, and 2) promote a return to normalcy'[27] (pg. 254). This guide's other chapters are primarily about the first goal—preventing and reducing excess death, disease and malnutrition. The second chapter—Health Services—is primarily about promoting the return to normalcy. Other concerns are preventing and reducing excess deaths, disease and malnutrition by promoting the sustainability of the health services that are provided during emergency relief operations. Having a health system in place is a means of increasing the sustainability of emergency

relief services. Principles as well as practical advice about how health services in emergencies should be planned, designed, implemented and evaluated are also provided. Particular attention is also given to adjustments that might be needed in the post-emergency phase after excess mortality and morbidity have been reduced to expected levels.

Organisation of the chapter

The chapter's approach begins with existing Sphere standards and guidance. It uses this information as a springboard for additional guidance and clarification. Each of the Sphere standards about health systems and infrastructure serve as the chapter's sections. Each section is organised under the title of 'essential tasks'. Because the tasks in the Sphere guidelines are too often left implied rather than fully stated, this chapter will clarify and order them in full as well as those additional tasks that have been taken from other experiences. Essential tasks during the emergency phase of a relief operation will be discussed separately from those in the post-emergency phase. Each section of this chapter will be organised by:

- Section title;
- Sphere standard;
- Purpose and rationale;
- Essential tasks—emergency phase;
- Essential tasks—post-emergency phase; and
- Sphere indicators.

Prioritising health services

Sphere standard

> All people have *access* to health services that are *prioritised* to address the main causes of excess mortality and morbidity.

Purpose/Rationale

Conducting an assessment with the elderly in Lebanon. Photo: International Federation.

During emergencies, death rates can be extremely high. The percentage of people dying because of the emergency can be at least two times greater than expected; this percentage is called a mortality rate or a death rate. For example, the death rates among displaced populations were eighteen to forty-five times greater than non-displaced populations during the emergencies in Sudan and Ethiopia.[33] To prevent rapid and excess mortality during emergencies, health and other services such as food aid or shelter must focus on the immediate causes of death.

Death rates are often highest among vulnerable groups such as children and the elderly. To prevent rapid and excess mortality again, health services must also reach vulnerable groups. The principle implied here is 'ensuring equal access according to need.'[27]

It is helpful to define health services for populations displaced either by natural or human-made disasters by including the services that are provided by:

- The host government;
- NGOs;
- Mission hospitals;
- Private practitioners;
- Traditional birth attendants; and
- Traditional healers.

The health system approach looks at integrating and coordinating all the services and providers. Although being primarily responsible for the health of the displaced populations within its borders, a host government might be reluctant to take up this responsibility if it is taking part in the conflict that is causing this population displacement. It might delegate some or all of these services to other local or international agencies. If the lead health agency is not the government, it is important to understand that the lead health agency, nevertheless, derives its authority and responsibility from the host government and not the international community.

The remainder of this section outlines the essential actions that humanitarian workers must take to meet the Sphere standards. Actions relevant to the emergency phase are organised separately from actions relevant to the post-emergency phase. Sphere indicators are also provided at the conclusion of this section. Humanitarian workers can refer to these as measures of whether or not the standards have been adequately applied.

Essential tasks: prioritizing health services

Figure 2-1: Tasks prioritising health services

1. Conduct an initial assessment;

2. Identify the major causes of morbidity and mortality;

3. Use evidence-based intervention to address major causes of morbidity and mortality; and

4. Develop a health information system to identify epidemics and guide changes needed in interventions.

Task 1: Conduct an initial assessment

Every public health emergency is different. The health system approach must be tailored to a given situation. A targeted and coordinated response to any emergent situation requires an initial rapid-assessment to gather information about how activities should be prioritized and how decisions should be made. A challenge for international as well as local health professionals is often to think the public health way. When using a public health approach, health priorities in the affected population are set by connecting water

and sanitation, vector control, shelter, and nutrition needs together with health care system capacity, basic health care needs, reproductive health epidemics etc. Please see the *Epidemiology Chapter* of this book to learn more about how to conduct a rapid-assessment. Please also consult sample assessment forms and checklists.

Other assessments besides rapid-assessments are often needed to gather more information for establishing priorities and developing intervention plans. Information should be constantly collected even as the intervention programmes are being implemented. Gathering the information will require sample surveys which can take several weeks to plan, train for and conduct. Reassessments such as the end of the emergency phase are also often needed to determine what further shifts in priorities should be taken.

Task 2: Identify the major causes of morbidity and mortality

Figure 2-2: Major Sources of disease among the displaced

As reported by Toole and Waldman, the most common causes of death among refugees during the acute emergency phase are diarrhoeal diseases, measles, acute respiratory infections, malaria and other infectious diseases.[33, 34, 35] A high prevalence of acute protein-energy malnutrition often leads to an increase in the case-fatality rate for communicable diseases and to high crude mortality rates.

Different health problems tend to arise at different times shortly after the outbreak of a disaster or emergency. Severe injuries, requiring immediate care, are often more frequent at the time and onset of a disaster. Even afterwards however, major outbreaks of communicable diseases may occur, particularly in overcrowded areas with poor sanitation.

There are three major sources of disease among the displaced:[23, 12, 16] Diseases

- Arising in camps because of unhealthy living conditions (e.g., acute respiratory infections, diarrhoea, and measles). The risk of acquiring these diseases is increased by malnutrition;

- Within a new environment against which displaced persons might lack immunity (e.g., malaria or meningitis); and

- Imported by displaced persons from a previous environment (e.g. TB, HIV/AIDS, body lice, parasites) or that is unique to their population (e.g., sickle cell disease). These diseases are usually less common causes of morbidity and mortality than others.

The risk of communicable diseases is higher in complex emergencies than in natural disasters. This, however, can vary depending on the type of emergency. While the table below can help agencies prepare, a local assessment will still be needed to verify the public health impact in each situation.[27]

Table 2-1: Public health impact of selected disasters[27]

Public health impact of selected disasters					
Effect	**Complex emergencies**	**Earthquakes**	**High winds (without flooding)**	**Floods**	**Flash floods tsunamis**
Deaths	Many	Many	Few	Few	Many
Severe injuries	Varies	Many	Moderate	Few	Few
Increased risk of communicable diseases	High	Small	Small	Varies	Small
Food scarcity	Common	Rare	Rare	Varies	Common
Major population displacements	Common (may occur in heavily damaged urban areas)	Rare	Rare	Common	Varies

Source Sphere (2004)

Please refer to the *Control of Communicable Diseases* section of this guide for information about potential disease threats in complex emergencies and natural disasters.

Use the information gathered to calculate the selected indicators. Disease burden before the disaster is often not easy to determine because of inadequately developed health information systems. One must also question the reliability of all findings. Information about how to calculate rates, ratios and proportions of public health importance e.g. crude mortality rate, the under-five mortality rate and incidence rates for diseases is provided in the *Epidemiology and Surveillance* chapter of this guide.

Figure 2-3: Determining mortality and morbidity rates

Mortality rates are difficult to determine accurately. A surveillance system is established over time. In the assessment's early phases, existing data sources should be utilised despite their accuracy not being the best. This can include counting recent graves or finding existing death records. After the initial phase, a retrospective mortality survey can be carried out for a more precise estimate of recent mortality rates. A system recording all deaths at health facilities and in the community should be established as soon as possible, however. Home visitors may be trained to enquire the number of deaths their last visit.

Morbidity rates are also difficult to capture accurately in an emergency's early phases. In the assessment's first phase, morbidity patterns should be drawn from discussions with health workers providing services to the refugee population and a review of facility registers.[20] Alternatively, assessment teams might individually observe cases at health facilities. As soon as possible, a morbidity surveillance system should be established for tracking morbidity patterns.

Triangulate the information collected in the assessment. Triangulation is a technique for minimizing biases in the information collected during the initial assessment. With the assessment having to be done quickly however, it is difficult to carry out an initial sampling assessment using scientifically rigorous data collection methods. For more information regarding triangulation, see the *Epidemiology and Surveillance* chapter.

Produce an assessment report that must be shared with the Inter-Agency Standing Committee (IASC) cluster, with other sectors, the affected population, and both national and local authorities. Indicate in the assessment report if external assistance and other

appropriate strategies targeting health problems that cause the greatest mortality and morbidity are needed.

Incorporate the assessment findings into the local health information system or use the findings to set up a new information system if no local health information system exists.

Figure 2-4: Example of an Early Warning System (EWS)

In April and May 2004, WHO implemented an early warning system in Darfur, Sudan, for internally displaced persons. Although a surveillance system already existed in Sudan, there were none in the Darfur region. Top priority was given to strengthen the national early warning system to detect disease outbreaks and to enable rapid-response against public health threats among the displaced population. To strengthen the region's surveillance without creating a parallel system, an Early Warning System (EWS) was developed following the example of other national EWSs. To ensure widespread support, the EWS system was set up with input from government, UN agencies, NGOs and, most importantly, local health authorities and community representatives[8].

Task 3: Use evidence-based interventions to address major causes of morbidity and mortality

Use proven and cost-effective interventions in emergencies to prevent and control morbidity and mortality in large populations.

Figure 2-5: Examples of proven and cost-effective interventions

Proven interventions in emergencies include the following:

- Provision of sufficient water;
- Chlorination and protection of drinking water;
- Adequate access to sanitation;
- Measles immunization;
- Food aid and food security;
- Shelter; and
- Basic clinical services.[27]

Guidance on these interventions is provided in other sections of this guide.

Cost-effective interventions can be difficult to conduct at an emergency's onset, especially those requiring significant knowledge of the local population and its health practices (e.g., exclusive breastfeeding for first six months of life).

Introduce interventions in phases. Some services must be introduced during the acute emergency phase while others should be planned but not implemented until the post-emergency phase. In the acute emergency phase, focus first on both preventive and clinical health interventions for diseases that could create an epidemic.[27] Table 2-2 below compares priority health services between acute emergency and post-emergency phases:

Table 2-2: Priority health services in emergencies by phase[1]

Health service	Emergency phase	Post emergency phase
Child health	- Curative: manage common diseases (Acute Respiratory Infection, diarrhoea measles, malaria, skin infections, anaemia); - Immediate care-seeking/referral for danger signs; - Immunization: measles; - Nutrition: assessment, rehabilitation, vitamin A, deworming.	- Integrated management of childhood illnesses (IMCI) protocols (ARI, malaria, diarrhoea, etc); - Epidemiological programme (measles, diphtheria, polio, whooping cough, TB).
Curative care	- Manage common diseases (triage, outpatient, referral, inpatient, dressing/injection); - Establish simple case definitions; - Standard treatment protocols, procedures for patient management including admissions and referrals.	- Manage TB under special conditions; - Consider other chronic diseases (diabetes mellitus, hypertension, arthritis) in mid-level developing countries, heart disease.
Surgery	- Manage minor injuries; - Support existing structures to ensure safe referrals of emergency conditions and major injuries to hospital; - Temporary field units if poor access to referral hospital.	Surgery for chronic conditions such as hernia or uterine prolapse.
Reproductive health	Minimum Initial Service Package (MISP): - Reproductive Health Kits; - Manage sexual/gender violence including emergency contraception; - Ensure safe deliveries in the community and at health institutions; - Refer obstetric complications to Emergency Obstetric Care (EOC) facilities; - Provide free condoms; - Promote universal precautions against HIV/AIDS.	Comprehensive care: - Provide Ante Natal Care (ANC): risk screening, supplements, immunization, monitor signs, prophylactics; - Emergency Obstetric Care including treating complications of abortions; - Post-Natal Care (PNC): nutrition, health education on breast feeding and infant care; - Family planning information and services; - Prevention and treatment of STI/AIDS.
Pharmacy	'Push' system for drug kits; - Interagency Emergency Health Kits.	'Pull' system for ordering drugs - Essential drugs and supply (stratified for different levels); - Diagnostic flow charts and standard treatment protocols.

2

Health systems and infrastructure

Health service	Emergency phase	Post emergency phase
Laboratory	▪ Initially none: clinical diagnosis or referral of specimens; consider arranging for rapid transmission of specimens to a reference laboratory to confirm an outbreak such as cholera, dysentery or meningitis; ▪ As soon as possible, provide tests that can identify major disease outbreaks or high drug-resistance (malaria, dysentery).	▪ Basic laboratory investigations to improve diagnosis and quality of care (malaria smear, stool ova/cyst, haemoglobin, gram stain, sputum smear, blood sugar, HIV test). Possibly blood transfusions.
Mental health	▪ Provide psychosocial support activities in the community; ▪ Prepare plans; ▪ Expect that persons who are chronically mentally ill may arrive who are already on medication and need to have treatment continued even in the emergency phase.	▪ Community-based programme for the emotionally traumatized.
Health information system (HIS)	▪ Initial Assessment; Establish surveillance system using simple indicators: ▪ Daily death rates: #/10,000 people/day; ▪ Daily morbidity rates; ▪ Demographics: census, rate of influx.	▪ Ongoing surveillance using comprehensive indicators; ▪ Weekly or monthly morbidity/mortality rates (depends on event): #/1,000 people/month ▪ Regular population-based surveys (generalised); ▪ Periodically modify the Health Information Systems to monitor less urgent diseases, or differences in disease patterns.
Preventive health	Community Health Worker and volunteers activities include: 1. Prevention: IEC on child care, assist immunization; 2. Prevention: Oral Rehydration Therapy, identify/treat cholera, malaria; 3. Prevention: recognise/refer cases of malnutrition for treatment; 4. Data collection: disease surveillance, population estimates.	▪ Community mobilisation for disease control activities; ▪ Tertiary care: reduction of physical disability.

Task 4: Develop a health information system that will help identify evolving health needs and guide changes needed over time in interventions

▪ As the situation permits, always improve the health information system and surveillance systems. Separate the mortality and morbidity statistics and classify them under 'cause,' 'age,' 'gender' and 'ethnic group.' Note that collection of data about ethnicity is always extremely sensitive;

- Add or modify interventions that address changing patterns of mortality and morbidity; and
- Refer to the standard on health information systems for further guidance on this task.

Essential tasks: ensure access to health services

Figure 2-6: Tasks to ensure access to health services

- Identify vulnerable groups and their specific needs;
- Organise services to improve access to vulnerable groups;
- Involve community members and other concerned groups in the initial assessment and in the design and development of interventions; and
- Seek women's views about health problems and ways to improve health services.

Task 1: Identify vulnerable groups and specific needs

As a starting point, assume that women, children, elderly, disabled and persons living with HIV/AIDS are vulnerable groups.[27]

Identify other vulnerable groups in each situation. Include persons identified as being:
- Of a specific ethnic or religious group;
- At risk in certain areas because they are internally stranded or are unable to seek safety;
- A certain political party; and
- Homosexual or bisexual.

Local populations often suffer from a sudden influx of displaced people. It is necessary to ensure equal services and access for all.

Task 2: Organise services to improve access to vulnerable groups
- Organise facility- and community-based health services to optimise access based on the need for health services; [27]
- Be always looking for evidence of groups being excluded for whatever reason from health services;
- Adjust health services as indicated to meet underserved groups;
- Identify ways for formal and informal payments for health services.
- Develop a system of waivers or vouchers for those who cannot pay for services;
- Include women in health services staff;
- Include representatives from other vulnerable groups and ethnic minorities; and[27]
- See the additional guidance on the staffing of clinical services later on in the health systems and infrastructure section of the guide.

Task 3: If not already accomplished, involve community members and other concerned groups in the initial assessment and in the design and development of interventions
- Include key stakeholders in data collection and analysis efforts; [27]
- Invite local authorities, health workers, community leaders and community members to participate in data collection;
- Provide training for collecting information (interviewing, observation, use of instruments and guides, etc);
- Invite key stakeholders to participate on data collection teams;

- Include key stakeholders and those unable to participate in previous data collections in rapid-assessment analyses, household surveys and surveillance data; and
- Include key stakeholders in the design and planning of interventions. They can participate full-time in discussions and can provide feedback on draft plans.

Encourage the participation of beneficiaries and other stakeholders. If certain groups or stakeholders were not included in initial data collection efforts or planning, increase their participation. Even after interventions have been designed and initiated, always encourage feedback from beneficiaries, stakeholders and vulnerable groups especially on the quality of services provided.

Task 4: Seek women's views about health problems and ways to improve health services

Ensure women are interviewed both individually and in groups in the initial assessment and other community based data collection efforts. This should also include exit interviews at health service delivery points.

Note: Because women and children together form the majority of most populations both emergency and non-emergency and because women are usually the primary caretakers of children, women are important informants about:

- Health problems;
- Reasons for current health practices; and
- The perceived quality of health services.

Always include women when involving community members and other stakeholders in the design and development of interventions (see task 3 above).

Essential tasks: post-emergency phase

Task 1: Continue to evolve the health information system and interventions as indicated

When the situation allows, dividing the data by age group, gender and ethnic group. The lead health agency will at some time develop standard mortality and morbidity reporting formats and scheduling for all health agencies.

Complement facility-based reporting with community-based assessments to assess population coverage of health services and health practices. If not already started during the acute emergency, random sample household surveys are used to determine population-based information about immunization coverage, home treatment of minor illnesses (e.g., oral rehydration for children with diarrhoea), care-seeking for danger signs (bloody diarrhoea, difficult breathing, etc.), use of reproductive health services, home feeding practices, hygiene behaviour, and protection of drinking water.

Provide additional critical services, at the facility and community level, to control both communicable and non-communicable disease, especially reproductive health services that may not yet be fully operational.

Task 2: Increase capacity of the community and local health leaders to design/redesign and implement of health services

Build the capacity of local health staff, volunteers and community members to collect, analyze and use data for setting priorities. This will continue prioritizing health services based on data while supporting the local health system.

Shift control of data collection and analysis and planning with your agency's capacity building support to local health staff and community members (e.g. community health committees, community health workers) as their capacity increases.

Sphere indicators

Figure 2-7: Sphere indicators for prioritising health services

▪ The major causes of mortality and morbidity are identified, documented and monitored.

▪ Priority health services include the most appropriate and effective interventions to reduce excess morbidity and mortality.

▪ All members of the community, including vulnerable groups, have access to priority health interventions.

▪ Local health authorities and community members participate in the design and implementation of priority health interventions.

▪ There is active collaboration with other sectors in the design and implementation of priority health interventions, including water and sanitation, food security, nutrition, shelter and protection.

▪ The Crude Mortality Rate (CMR) is maintained at, or reduced to, less than twice the baseline rate documented for the population prior to the disaster.

▪ The Under-Five Mortality Rate (U5MR) is maintained at, or reduced to, less than twice the baseline rate documented for the population prior to the disaster.

Supporting national and local health systems

Sphere standards

Health services are designed to support existing health systems, structures and providers.

Purpose/Rationale

The best way of setting up an emergency health programme is to strengthen the local system. Local health systems are best designed to work in local conditions. Local providers are experienced with prevalent medical conditions. Because local health workers familiar with prevalent customs and social structures serve as managers and service providers better than foreigners, they should be integrated into the health services where appropriate. Working with national and local health systems uses human and material resources efficiently, minimises redundancy and strengthens systems allowing the delivery of high-quality services both during and after an emergency. Local health systems might have the capacity to absorb the additional demand of displaced populations when:

Photo: International Federation

▪ The total displaced population does not overwhelm the local services.

▪ There is little political tension between the local population and the newcomers.

▪ There is no excess demand for health services (no disease outbreak or mass casualty).

The scope and nature of the public health emergency might, however, exceed local response capacity. Relief agencies, therefore, should try to strengthen the local health care's capacity system before establishing a health system. If existing health facilities are

assessed and repaired, tents can be donated to increase the facility's size. Local health services' overall quality can be improved with the regular supply of essential drugs and trained staff. The advantages of augmenting local services rather than establishing a parallel system are that:

▪ Both the host and displaced populations benefit equally, thereby reducing resentment from the local population;

▪ Resources are not wasted through the duplication of services; and

▪ Local health authorities are directly involved with the displaced population's problems.

Where a parallel health system must be established, the health programme should be directed by the lead health authority and the host government's health policies about essential drugs, treatment protocols and its referral system should be respected. This section describes how humanitarian agencies should support national and local health systems in their work.

Essential tasks: emergency phase

Figure 2-8: Tasks to support national and local health systems

▪ Support the efforts of the agency responsible for leading the health sector;

▪ Support and strengthen local health facilities;

▪ Support and integrate local health workers into health services; and

▪ Incorporate or adapt the existing standards and guidelines of the host country.

Task 1: Support the efforts of the agency responsible for leading the health sector

Identify the lead agency responsible for organising and coordinating health sector efforts in the emergency. The Sphere standard is for the ministry of health (MOH) if and when possible to lead the health sector in the emergency. [27]

Note: Only if the MoH cannot organise or coordinate health sector activities, should another agency take the lead. The Inter-Agency Standing Committee (IASC) cluster such as WHO, United Nations Children's Fund (UNICEF), or the United Nations High Commissioner for Refugees (UNHCR) can take the lead until the MoH is able to do so. If neither the cluster is in operation, nor the MoH nor any UN agency has the required capacity, another qualified agency or organisation can temporarily take the lead.

▪ Work closely with the lead health agency;

▪ Support its priorities;

▪ Coordinate closely with other health organisations;

▪ Ensure that staff members regularly attend health sector coordination meetings organised by the lead health agency;

▪ Ensure the sharing of assessment findings about what organisations are doing and where;

▪ Align each organisation's priorities and objectives with those defined by the lead health agency; and

▪ Follow the policies and procedures that the lead health agency requests such as treatment guidelines and reporting formats and schedules.

Note: One of the roles of the lead health agency is to ensure that agencies working on health-related efforts support and strengthen the local health system in the emergency. The lead health authority must also ensure that all health agencies' efforts are coordinated, efficient and avoid any duplication of services. The lead health authority

must also develop health-related strategies, policies and procedures that establish priorities and objectives. [27]

Aligning each organisation's efforts with the direction provided by the lead health authority, therefore, helps achieve this standard of supporting national and local health systems. Collecting and sharing health information requested by the lead health agency, helps this agency develop strategies, policies and procedures that meet local epidemiological and development needs and help strengthen the local health system. Coordinating activities (such as assessments, priority setting and interventions) through the IASC cluster or with the other agencies working in proximity, helps achieve optimal efficiency and effectiveness. The importance of these tasks cannot be overstated.

Task 2: Support and strengthen local health facilities

▪ Adhere to the Sphere Project standards by taking a health system approach;

▪ Do not establish new health services where there are already services;

▪ Strengthen the health services further to meet needs;

▪ Make existing health facilities more effective;

▪ Establish new health facilities only if existing health services cannot be sufficiently strengthened;

▪ Establish new health facilities such as field hospitals in consultation with the lead health agency. [27]

Note: This step implies that an assessment of existing health facilities' capacity has already been carried out. To see if health needs can be met with support from the existing facilities, carry out an assessment of:

▪ Facility destruction;

▪ Space, staff and staff training;

▪ Essential equipment and supplies; and

▪ The integrity of the cold chain.

Table 2-3 below describes the expected basic capacities for health services by their level in the health system.

Table 2-3: Basic capacities of health services by level[1]

Levels of emergency health care for displaced populations (emergency phase)				
Capacities	**Community-level**	**Peripheral level**	**1st Level facility**	**1st Referral hospital**
Facility	Depends on type of activities (home-visits can be supervised from health post	Dispensary or health post (ambulatory care)	Health centre	District hospital Field hospital
Service capacity (Ratio to Population)	1 CHW per 500-1000 persons	1 facility per 5,000-10,000 persons	1facility per 30,000-50,000 persons or 1 per every 10 km	1 facility per 150,000-300,000 persons
Health activities	Case-finding, referral, health education, data collection (curative for common ailments, e.g. fever, diarrhoea)	Curative for minor ailments, referral, Oral rehydration therapy, dressing, immunization, data collection	Child care, health education, out-patient/inpatient care, referral, essential drugs, reproductive health, (possibly basic labor-atory, transfusion, surveillance)	Emergency obstetric care, emergency surgery, outpatient/ inpatient care, referrals, follow-up, rehabilitative care, laboratory, blood bank, X-ray, logistics

Figure 2-9 below describes issues to consider when supporting local health facilities to serve displaced populations.

Figure 2-9: Issues to consider when supporting local health facilities

- Consider compensating local services to extend health care to the displaced population. For example, pay the user fees for displaced people where cost-recovery programmes exist. In one example from Guinea, UNHCR covered the fees for refugees at the same rate as the locals. In an example from Kenya, outpatient consultations for refugees were free, but UNHCR was charged double rates for inpatient care and diagnostic procedures;

- Consider if the means for communication and patient transfer between different levels of health care sites needs support to improve access to health care and referral services;

- Provide incentives to health workers for handling an increased workload. Local health staff from less affected areas can be seconded to the emergency health programme;

- Organise various in-service training courses; and

- Agree with the lead health authority on exceptions to national health policies e.g. TB treatment and measles vaccination programmes for large displaced populations that can differ from those in place for the host population.

Task 3: Support and integrate local health workers into health services

Support and integrate local health professionals (doctors, nurses, health officers, midwives, skilled or trained birth attendants). Unfortunately, because they and their families may also be affected by the disaster, they can only offer their services periodically. To organise and support them is vital to engaging them in clinical and other health-related activities for the displaced and host populations. This means helping them integrate into different and undamaged facilities or working in new facilities established by humanitarian agencies.

Figure 2-10: Integrating local health professionals

Health professionals among displaced populations

The displaced population might have doctors and nurses who have been formally trained in their country of origin but lack certification to work in the local health sector. As interventions work ideally within the local health system and standards, it may not be possible to incorporate these professionals directly into the emergency health programme. The emergency health system, however, should encourage their co-operation to streamline patient management practices (especially drug treatments) and report communicable diseases.[1] NGOs could help these professionals acquire country licenses, recognition or approval from the host country.

Non-Governmental Organisation (NGO) hospitals

NGO hospitals may be set up by religious institutions before the emergency occurred. They often provide quality health care for a small fee. Their critical role at the onset of a disaster can be overlooked after the emergency health system has been set up. Close links should be maintained for mutual support between these hospitals and the health care system.

- Support and integrate community health workers (CHWs);
- Support and train volunteers; and
- Develop a Community Health Workers (CHWs)/volunteer programme if none exists.

Community Health Volunteers (CHVs), Health Information Teams (HITs), home visitors (HVs), or Village Health Volunteers—are all different names for members of the community who are trained to act as direct intermediaries between the beneficiary population and the health care system.

Figure 2-11: Notes on supporting a Community Health Worker (CHW) programme

Purpose: CHW and volunteer networks extend emergency health care coverage through preventive health activities such as disease control and surveillance. Not only do they mobilise the community for public health initiatives, CHWs reduce the patient burden at health facilities by increasing the population's awareness of how to improve their own health and take preventive health measures, e.g. by taking Oral Rehydration Solution (ORS) early to prevent dehydration. This allows health facility staff to concentrate on more severe conditions.[1]

Training: The appropriate level of CHW and volunteer training depends on both the available resources (including CHW/volunteer trainers and supervisors) and their expected role in providing Primary Health Care (PHC). In the acute emergency phase, initial training should focus on simple priority tasks that address immediate health needs such as:

- Identifying cases of disease as early as possible;

- Referring the seriously ill as early as possible;

- Identifying vulnerable groups;

- Organising IEC (Information, Education and Communication) about disease prevention and control e.g. water and sanitation, re-hydration, good nutrition, immunization, safe motherhood care, condom distribution and protection from sexual violence; and

- Data collection of all the above activities.

Issues: The following issues should be considered when supporting (or setting up) a CHW/volunteer programme:

- Ensure that CHWs/volunteers are selected from all ethnic groups and that at least half are female;

- Realise that some CHWs/volunteers may be illiterate and will need support in keeping records of their activities; and

- PHC programmes work better when the role of the CHW/volunteers are well-defined and when the volunteers receive visible support from both the community and the entire health care team.

- Support and integrate alternative providers in health care services.

Alternative providers are part of the health system and need to be considered when planning health services. Members of the host or displaced populations may prefer taking certain health problems, such as mental health problems, to alternative providers. Both formal and traditional health practitioners can equally manage broken bones. The formal health provider, however, might be better when treating meningitis while traditional healers might be more skilled in managing grief and depression. Wherever possible, alternate health providers should be include in training workshops, regular meetings and supervision visits. This will improve patient care and referral and will discourage harmful

practices. Traditional healers can also participate in preventive health measures such as immunizations and HIV/AIDS prevention.

Figure 2-12: Notes about alternative providers (traditional healers)[1]

- Alternative providers are part of the health system and can be important sources of health care, especially mental illness.
- It is important to acknowledge traditional concepts of illness and disease.
- Many rural populations consult traditional healers respond to the populations' health care demands instead of addressing only their medical needs
- Humanitarian workers should identify the most common alternative providers and understand the reasons why the population turns to them.

Alternative providers may include the following:

- *Spiritual healers* are especially skilled in helping 'sick souls' cope with 'evil spells' and acute psychological and social stress;

- *Traditional healers* may specialise in bone-setting as well as in common ailments. In emergencies, healers may not have access to the herbs and plants they normally use. If these remedies are not harmful, field staff should help healers to obtain them or give alternatives. Some traditional healers may be willing to use modern treatment (e.g., Oral Rehydration Therapy);

- *Traditional Birth Attendants (TBAs)* whether *trained* formally or traditionally provide a wide range of services to pregnant women and new mothers by providing washing, cooking and caring services. Because all deliveries cannot be conducted in the health facilities, TBAs take charge of about 50 to 80% of all births among the displaced population. Most expectant mothers and children who are at 'special risk' will fall within the TBAs' domain. There is a critical need for skilled TBAs to reduce maternal mortality in emergency situations. TBAs' knowledge and skills in monitoring pregnancies and conducting safe deliveries at home should be assessed. Further training should be provided when detecting and managing high-risk pregnancies and complicated deliveries. TBAs can provide counselling about child spacing and childcare and keep records of their activities. They require regular supplies and supervision, however;

- *Elders* are older men and women responsible for puberty rites and for educating adolescents on sexuality, reproduction and family life: and

- *Other providers* in the community provide informal services such as religious education, family counselling and the rites of marriage and burial, etc. The community's overall health needs can be strongly represented within the emergency health system by integrating community leaders, religious leaders, teachers, and social service organisations.

Task 4: Incorporate or adapt the existing standards and guidelines of the host country

Follow the guidance of the lead health agency. The Sphere standard adheres to the standards and guidelines of the host country. [27] It includes treatment guidelines and essential drug lists. It is the responsibility of the lead health agency early in the emergency response to review existing guidelines and update them. See the standard for clinical services for additional guidance.

Note: *Existing ministries of health (MoH) guidelines may not be sufficient for the current emergency and will need to be updated. In emergencies most organisations use existing guidelines from the MoHs, WHO or UNICEF. Many of these have been developed for stable situations but not for emergencies.[18] In addition, 'all of the guidelines needed for care of children in complex emergencies are not located in a single source, and the*

majority target higher level health care workers and programme planners.' [(pg. 34)] *For example, few existing guidelines distinguished the management of severe disease from that of childhood illness; nor did the guidelines include nutritional support as part of case management. Moss et al found no guidelines that included management of persistent diarrhoea. WHO's standard guidelines for Integrated Management of Childhood Illness (IMCI) have not been developed for emergencies. Modifications such as including emergency triage assessment and treatment guidelines or simplifying the guidelines for community health workers are, therefore needed for these situations.*[18]

Essential tasks: post-emergency phase

Task 1: If parallel health services exist, integrate health services for displaced persons with the health services for the local population

Where populations remain in a displaced status for many years, parallel health services can result in inequities between the health resources available to displaced and to local populations and health outcomes.[2, 26] To reduce inequities and increase efficiency, the parallel health services must be integrated. Equally, the quality of services received by the displaced or and the local populations are not to be diminished but enhanced. The integration process is an opportunity to improve quality of services. Burnham et al., and Rowley & Burnham have outlined a quality design process for integration that is summarised below.[2, 26]

Develop a detailed, consensus-driven plan for integration. Begin by developing a consensus among those responsible for leading the integration process and ends. Give specific work plans for integrating each key service provided in parallel.

Figure 2-13: Example of consensus-driven quality-design plan

> The following steps for developing a consensus-driven quality-design plan to integrate refugee and local health services were carried out in Northern Uganda between 2000 and 2001: [2, 26]
>
> ▪ Step 1—Create a common will and vision for change;
>
> ▪ Step 2—Understand and document the current situation;
>
> ▪ Step 3—Build consensus among stakeholders about priorities;
>
> ▪ Step 4—Establish a quality design team to follow up priorities;
>
> ▪ Step 5—Provide training and tools for the team;
>
> ▪ Step 6—Gather data on priority services and assess the health services resource base;
>
> ▪ Step 7—Provide feedback to stakeholders and solicit responses;
>
> ▪ Step 8—Analyze data to determine common and divergent areas; and
>
> ▪ Step 9—Establish work plans to bring divergent processes together.
>
> A description of this process can be downloaded from the Quality Assurance Programme (QAP) website: http://www.qaproject.org/pubs/PDFs/Ugandaint.pdf

Implement the integration plan. In the Uganda example above, action plans for integration were included in local health system work plans for the coming year. This step helps integrate these particular services—those that overlapped with refugee health services—into the general planning process and with other health services provided by the local health system. This process is also more likely to meet the approval of higher health management levels who have established planning processes.

Monitor and evaluate the quality of integrated services. The monitoring plan for integrated services should be integrated into the local health information system. Using the health system approach, the inputs, process, outputs and outcomes of these services should be monitored alongside the local health system's other services. Special attention should be given to the process or quality of services such as compliance of health workers with standard case management protocols.

Task 2: Increase efforts to involve community members in health promotion activities

Increase efforts to identify community members and community volunteers who provide services. Integrate them into the health system. Assuming that the burden on health services are reduced when excess mortality has been reduced to near baseline levels, humanitarian workers can increase the time they spend 'in the community.' They can be used to train more community health workers. They can also identify alternative providers and engage them in standardizing care according to treatment guidelines.

Increase efforts to involve community members in the assessment and planning of health services. In the post-emergency phase, increase efforts to involve community members in assessing existing health services. Have them make their own suggestions about improving quality and access of services. Include the perspectives of vulnerable groups. Consider strengthening or establishing community health management committees that can provide oversight of health services. Use focus group discussions facilitated by staff or community members to identify where services are not meeting the needs desired by the community.

Sphere indicators

Figure 2-14: Sphere indicators for supporting national and local health systems

- Representatives of the ministry of health (MOH) lead the health sector response whenever possible;

- When the MOH lacks the necessary capacity, an alternate agency with the requisite capacity must be identified to lead the health sector;

- Local health facilities are supported and strengthened by responding agencies;

- Local health workers are supported and integrated into health services, taking account of gender and ethnic balance;

- Health services incorporate or adapt the existing national standards and guidelines of the disaster-affected or host country; and

No alternate or parallel health facilities and services should be established including foreign field hospitals unless local capacities are exceeded or the population does not have ready access to existing services. The lead health authority should always be consulted.

Coordination

Sphere standard

People have access to health services that are coordinated across agencies and sectors to achieve maximum impact.

Purpose/Rationale

The primary purpose of coordination is to achieve maximum impact with existing resources[27]. Without coordination, efforts of health agencies are often inefficient by duplicating services in one area while other areas are left uncovered. After the 2005 earthquake in Pakistan, seventeen NGOs at one period were serving the same population of about 5,000 persons, but only one NGO was serving a population of about 150,000 (R. Brennan, personal communication). According to Toole et al., 'a major weakness of NGO-provided services is that they are often poorly coordinated, act in parallel with the state systems, have a different vision of the system they are seeking to bolster or re-establish, and compete for partners, resources and publicity … increasingly, there is a debate regarding how best such services could interface with host government services and policy and could reinforce the limited capacity often present.'[32] (pg. 502). The IASC cluster system was created to ensure better coordination and cooperation between all actors including the government.

It is the lead health agency's responsibility to coordinate all the activities of agencies working in the health sector and help ensure alignment of activities and strategies with the host government policies. Coordinating with the lead health agency, therefore, is the key mechanism for 'interfacing' with the host government and identifying ways to 'reinforce the limited capacity' present. This supports the strengthening of health systems and infrastructure approach rather than establishing parallel health systems which should be avoided. [Note: Médecins Sans Frontières provides a detailed chapter on coordination in its Refugee Health book; this book should be an additional resource for all managers of health programmes in emergencies.[20]]

Note: It should be recognised that, while important coordination is difficult, cooperation between organisations—a coordination requirement—might be difficult to achieve when there are many organisations competing for the same resources. There might also be insufficient incentives to coordinate if organisations do not include coordination as a professional standard. Coordination also appears easier in an emergency's early phases before programmes mature. Coordination may also be easier if funding sources —such as UNCHR—are limited or if donors acting together require that organisations receiving funds should coordinate.

Essential tasks: emergency and post-emergency phases

Figure 2-15: Tasks to support coordination across agencies and sectors

- Interact and participate with established coordination mechanisms within the health sector and between the health sector and other sectors;

- Clarify and document your agency's specific responsibilities in consultation with the lead health authority; and

- Ensure that agency staff members attend regular coordination meetings.

Task 1: Interact and participate with established coordination mechanisms within the health sector and between the health sector and other sectors

- Identify the lead health agency and leading actors of the government and UN agencies. In the absence of a designated lead agency, coordinate with the health system of the host country when possible.[27] In some situations, (e.g., in rebel held areas of Southern Sudan in the 1990s) it may not be possible to work with the host government and another agency will be responsible for coordination.[32]

▪ Work with the lead health agency, the IASC cluster and other agencies in the health and other sectors.[27] The primary purpose of coordination is to achieve maximum impact with existing resources. This purpose can be supported by avoiding duplication of effort and shifting resources to cover gaps. Working closely with the lead health authority and coordinating bodies is necessary for this.

Task 2: Clarify and document your agency's specific responsibilities in consultation with the lead health authority

Align your agency's work areas and responsibilities with the direction provided by the lead health agency and health coordinating bodies. This is essential for avoiding duplication of effort that wastes resources by having too much capacity in a single area especially when there are areas that have little or no support.

Clarify assigned work areas and responsibilities in writing. To avoid misunderstandings and to provide evidence to local and traditional authorities, clarify the already agreed responsibilities with the host government or lead health agency in writing.

Task 3: Ensure that agency staff members attend regular coordination meetings

Allocate sufficient staff resources so that your agency ensures that staff members attend coordination meetings at local and central level regularly. Health sector coordination meetings and all-sector general coordination meetings 'provide a forum in which information is shared, priorities are identified and monitored, common health strategies are developed and adapted, specific tasks are allocated, and standardised protocols and interventions are agreed upon.' [27] During the emergency phase, these meetings will be held weekly. During the post-emergency phase, these meetings will become less frequent.

Sphere indicators

Figure 2-16: Sphere indicators for coordination

▪ Established coordination mechanisms at central (national or regional) and at field levels within the health sector and between health and other sectors;

▪ Clarify and document each health agency's specific responsibilities in consultation with the lead health authority to ensure optimal coverage of the population and complementary services; and

▪ Hold regular health sector coordination meetings for local and external partners at both central and field levels.

Primary health care

Sphere standard

Health services are based on relevant primary health care principles.

Purpose/Rationale

The primary responsibility for the care of a large displaced population falls on the government authorities in the host country where a displaced population has settled or where a natural or human-made disaster has occurred. If the host country is unable to meet the health needs of the affected people, the host government authorities should invite humanitarian organisations to strengthen the local emergency response. The health

needs of large displaced populations are similar to everyday health needs of many urban or rural communities in developing countries.

Once the crisis is over, the displaced population is likely either to return to an environment with limited resources for health care or the health services provided to displaced populations may be at a higher level than provided to host populations, as was observed in Uganda. This created tension between the two populations.[25] It is appropriate, therefore, to use a Primary Health Care (PHC) approach. This will ensure that whatever skills the displaced population gains through community participation, health education, nutrition, and preventive health measures, can be used to ensure that the community takes responsibility for their health and rebuilds their future when they return to their place of origin.

The Declaration of Alma-Ata at the WHO International Conference on Primary Health Care in Alma-Ata is provided in Appendix 2-2. The declaration states that PHC is:

Essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process.[9]

Essential tasks: emergency phase

Figure 2-17: Tasks to implement primary health care approach

- Ensure access to health information for the affected population;
- Provide health services at the appropriate level of the health system;
- Utilise the referral system established by the lead health authority;
- Base health services and interventions on scientifically sound methods; and
- Utilise appropriate and socially and culturally acceptable technologies.

Task 1: Ensure access to health information for the affected population

Ensure that quality of health services is sufficient before increasing the demand for services. Assess the quality of health services and improve quality where indicated. Delay initiation of particular health information activities—those that will increase demand for health services—until such health services' quality are judged to be sufficient.

Conduct a programme of community health education and promotion that is locally appropriate. The Sphere standard is to undertake health education programmes in consultation with local health authorities and community representatives.[27] The education programme should take into account local beliefs and health seeking behaviour, utilise appropriate language and media and be culturally sensitive. An important message delivered in an inappropriate manner is unlikely to be well received.

Build knowledge among the affected population about major endemic health problems. Among displaced populations, major endemic health problems might be different from those in their place of origin. Endemic communicable diseases might be significantly different over short distances, particularly if there is a significant change in altitude that changes the natural habitat of insect vectors. Many infectious diseases, including malaria,

Health systems and infrastructure

2

are more severe in immune-naïve populations. Natural or human-made disasters might also change local ecology and open new niches for insect vectors and, hence, change the diseases endemic to a region. Education about means of disease prevention and about when to seek health care is essential to minimise morbidity arising from the 'new' endemic diseases that displaced population must face.

Provide information to the affected population about major health risks. The majority of immediate health risks for a population affected by a public health emergency are lack of adequate food rations and potable water, overcrowding and poor hygiene. These lead to outbreaks of communicable diseases including measles, meningitis, cholera and exposure to the elements due to inadequate shelter. In a public health emergency's acute phase, it can be impossible for the lead health authority and other health organisations to address all of the above issues immediately. Providing simple and relevant information about the major health risks that will be faced in the acute phase allows the population to protect and promote its own health and well-being while larger scale interventions are initiated and scaled up.

Build knowledge about hygiene and basic sanitation. Hygiene education must reinforce the importance of hand washing with soap. An additional focus must be placed on both domestic and personal hygiene, particularly safe food-handling practices. Soap must be made readily available by relief agencies.

Figure 2-18: Using soap to reduce diarrhoea[22]

A study in a camp in Malawi containing approximately 64,000 refugees from Mozambique found that, even in the absence of behavioural interventions or education campaigns, the presence of soap in a household showed a significant protective effect. There were 27% less episodes of diarrhoea in households when soap was present compared to when no soap was present.

Disseminate information about the availability and location of health services. In an emergency's acute phase, there might be varying levels of health services available. In some cases, a natural disaster such as a large earthquake might completely destroy a region's pre-existing health infrastructure completely. In other cases such as in mass population movements, local hospitals and health centres might continue to function but be overwhelmed by the demand for services. It is the lead health authority's responsibility to determine the pre-existing services that remain available and to coordinate the introduction of new services provided by international assistance agencies and NGOs. In a disaster's immediate post event, only emergent health services might be available. Educating the population about the services that might be available at a particular time will help reduce the demand on the health system. Information must be disseminated notifying the affected population about when health services will be expanded beyond acute care.

Work closely with the lead health agency to ensure that the content of priority health messages is up-to-date and consistent among implementing agencies. Ensure that your organisation's health education messages are consistent both with the home country's priorities and standards and with those being delivered by collaborating agencies. Regular liaison with the lead health authority will ensure that implementing agencies are up-to-date on health service availability.

Task 2: Provide health services at the appropriate level of the health system

Plan a comprehensive primary health care approach. This should be based upon four types of interventions:

- Promotive;
- Preventive;

- ▪ Curative; and
- ▪ Rehabilitative.[1]
- ▪ Promotive interventions address basic causes of ill health at the level of society;
- ▪ Preventive services reduce disease incidence by addressing the immediate and underlying causes at the individual level;
- ▪ Curative care reduces disease prevalence by stopping the progression of disease among the already sick; and
- ▪ Rehabilitative interventions reduce the long-term effects or complications of a health problem.

The delivery of basic primary health care cannot always be done by a static system. When a population is spread over wide areas or hard to reach, mobile systems may be the only alternative. It is costly and should always be seen as a temporary measure. Table below describes the types of services that may be provided in each of the four types of interventions for a selection of diseases commonly encountered in a public health emergency setting.

Table 2-4: Comprehensive framework of Primary Health Care[1]

Disease	Promotive	Preventive	Curative	Rehabilitative
Diarrhoea	Safe water, basic sanitation, food security, health education, child care	Education (on personal hygiene), breast feeding, measles immunisation	Oral rehydration, nutrition support, (drug therapy)	Nutrition rehabilitation, special ORS
Pneumonia	Good nutrition, adequate shelter, clean air, health education	Immunisation, breast feeding, vitamin A supplement	Drug therapy	Nutrition rehabilitation
Measles	Good nutrition, ventilated housing, health education	Immunisation	Drug therapy, nutrition support	Nutrition rehabilitation
Malaria	Good nutrition, vector control, health education	Mosquito nets, preferably insecticide treated, spaying, drug prophylactics	Drug therapy	Nutrition rehabilitation
Anaemia	Vector/parasite control, Good nutrition, health education	Screening, Iron/folate prophylactics, de-worming	Dietary supplement, blood transfusion, nutrition support	Nutrition rehabilitation (iron-rich food)

Figure 2-19: Pyramid of Primary Health Care[1]

District Hospital

Emergency care, referral care, hospital services including surgery

1st Level Health

Basic Primary Health Care services: maternal and child care, reproductive health treatment of common illnesses, and injuries, essential drugs, health promotion, nutrition, environmental health

Community

Food   Water   Sanitation   Shelter

(Adequate quantity/quality)   Appropriate facilities/site

Immunization, vitamin A, ORT, screening and referral surveillance, skilled birth attendants, STI control, health promotion

Home

Food	**Water**	**Sanitation**	**Shelter**
▪ Breast feeding	▪ Source	▪ Latrine	▪ Essential goods
▪ Weaning foods	▪ Storage	▪ Solid waste	▪ Psycho-social
▪ Food availability	▪ Collecting	▪ Vector control	▪ Prevention and
• Treatment childhood illnesses	quality	• Hygiene practices	treatment of diseases

Ensure access to basic primary health care services for populations difficult to reach. After some types of disasters, populations whether isolated by a major earthquake or made mobile by a mass population movement in response to conflict will be difficult for health services to reach. These populations might not have ready access to the levels of primary health care as described above. If needed, mobile clinics should be used to meet the needs of both isolated and mobile communities with limited access to care. Note, however, that mobile health clinics use a significant amount of resources. When operated appropriately, they fill a vital need, but when inappropriately, they can be underused or can divert needed health services from non-mobile efforts. They are also an inefficient use of already limited resources. The lead health authority and local health representatives should be consulted before introducing mobile health clinics.

Figure 2-20: Example of Mobile Clinic in Action

Example of mobile clinic in action

In Colombia, a low grade conflict and rugged geography has in some regions hindered the population's access to basic primary health care. The Colombian Mobile Clinic, managed by the Canadian Red Cross Society, provides services to these populations in regions that are both geographically isolated and are under armed conflict. The mobile clinic is staffed by two physicians, a dentist, nurse, pharmacist and a coordinator. It provides primary health care services to a population of approximately 30,000 Colombians in nine municipalities in the southern region of the Department of Bolivar[8].

Task 3: Utilise the referral system established by the lead health authority

Communicate with the lead health authority and determine the referral system. It is the lead health authority of the host country's responsibility to establish a health referral system. Often the referral systems are weak even in normal circumstances. They lack capacity, transportation and are poorly prepared for any disaster situation. Support for existing structures is preferable to the 'importation' of field hospitals etc. It is the health organisations' responsibility to communicate with the lead health authority to understand how the referral system is designed.

Follow the health referral system as established by the lead health authority. Health referrals to different facilities are typically made in the pyramid of primary health care (Figure 2-22) as required. Appropriate use of the referral system ensures that health issues are addressed at the most suitable level of the health system and services at the top of the pyramid, such as the district hospital, are reserved for surgical, obstetrical, complex medical and emergency care.

Adapt to any changes made to the referral system. Complex humanitarian emergencies are rapidly evolving. There are likely to be changes to the health referral system. Your organisation must maintain close contact with the lead health authority to ensure that your organisation is up-to-date about all changes.

Arrange for suitable transportation to the referral facility. In a public health emergency, the affected population is likely to have limited transportation. If a referral is appropriate, it is the referring party's responsibility to arrange suitable transportation for the patient to reach the referral facility.

Facilitate two-way communication between the referring and referral sites. Communication is essential for referral systems to work adequately. A referring site must know if persons referred have actually received the services. Once stable, persons can also be referred again to the initial referring site for follow-up care. Support for a referral documentation system will be needed. NGOs can help the lead health agency implement and monitor the documentation system.

Task 4: Whenever possible, base health services and interventions on scientifically sound methods

Work within lead health authority's framework. Whether it is the minister of health or a UN agency, the lead health authority will base its health care delivery on scientifically sound methods. Adherence to the framework will ensure that primary health care delivered by other health care agencies is also evidence-based.

Construct a strong foundation to the primary health care system using well established and tested interventions. The foundation of a comprehensive primary health care system is largely based on good nutrition, access to clean water and sanitation, immunisation against vaccine preventable diseases, maternal and child health and disease vector control. Shelter, hygiene and psychological support for additional sectors are essential for physical and mental well being. These items are addressed briefly because they are covered in depth elsewhere in this book. Detailed information about measles, malaria and the control of other infectious diseases can be found in the Control of Communicable Diseases section in this guide.

- **Nutrition**: Acute malnutrition is commonly encountered in public health emergencies and is an important predictor of mortality. A recent study in Sudan found between 11% and 24% malnutrition among internally displaced persons in three sites in South Darfur.[12] In Southern Somalia in 1992, acute malnutrition rates were as high as 75% amongst displaced persons.[34] The prevalence of malnutrition in a random sample of under-five-year-old children is generally a good predictor of malnutrition in a population. Scientifically sound means to calculate malnutrition rates include the

WHO Weight For Height (WFH), Z scores and the Mid Upper Arm Circumference (MUAC) method.[41] For evidenced-based nutritional interventions, please refer to the Food and Nutrition section of this book.

- **Water quantity and quality**: he Sphere Handbook gives evidence-based tables of water requirements for personal survival as well as various aspects of the health system. [27] The WHO Guidelines for Drinking Water Quality[39] provides health based targets for drinking water and outlines microbiologic, chemical and radiological aspects to water quality that may be adapted for multiple public health emergency situations. Please refer to the Environmental Health section of this guide for an in-depth assessment of water needs and issues in a public health emergency.

- **Sanitation**: The Sphere Handbook provides evidence-based recommendations about the number, location and types of toilets and latrines that should be provided.[27] Additional information is provided about safe human, agricultural and medical waste disposal. A full account of sanitation in public health emergencies can be found in the Environmental Health chapter of this guide.

- **Hygiene**: Over the years, the importance of hygiene promotion and practice has become an effective approach to minimise the spread of faecal-oral and other contagious diseases.

- **Shelter**: The Sphere Handbook provides minimum standards for minimum space and conditions necessary in emergencies. [27] We tend to forget that acute respiratory tract infections are perhaps the major killer in any disaster; therefore, adequate shelter, clothes and footwear are absolutely essential for preventing unnecessary death amongst children.

- **Immunization**: Measles is the one vaccine preventable disease that has been documented as being responsible for large numbers of loss of lives.[3] In refugee situations, the UNHCR advocates the immunization of children from six months to twelve or even fifteen years because of the increased risks from the crowded living conditions. Measles control can be strengthened by measles surveillance, case-management, and vitamin A distribution.[7]

Figure 2-21: Example of measles control

> The civil conflict in Sudan and the concomitant population displacements have resulted in the decrease of measles vaccination coverage rates. In 2003, coverage was reported to be 46%, 57% and 77% in north, west, and south Darfur, respectively. In March to April 2004, there were measles outbreaks in displaced populations in west and north Darfur. In response, the ministries of health and various NGOs conducted vaccination campaigns targeting children aged nine months to five years. Approximately 80,000 children were vaccinated in these campaigns and the transmission of measles was successfully reduced.[3]

- **Vector control**: Large volumes of scientific research outline the effectiveness of distributing insecticide-impregnated mosquito nets, shelter sheeting against malaria and other mosquito-born diseases. Also, spraying shelters with residual insecticide is effective and is being used more frequently in recent years than it was in the past.

Task 5: Utilise technologies that are appropriate and socially and culturally acceptable

- **Where possible, utilise technologies that had previously been incorporated into the local primary health care system**. Health interventions that were in place prior to the public health emergency are likely to be both socially and culturally acceptable to the community.

- **Encourage community participation**. Local beliefs and health seeking must be understood and respected to effectively design a primary health care response to a

public health emergency. Engaging the community members to assist in the planning and delivery of health services ensures that interventions are acceptable within the given society. Families and communities need to get actively involved in taking care of their own health. Communities can participate by creating and preserving a healthy environment, maintaining preventive and promotive health activities, and sharing information about their needs and wants with higher authorities.

▪ **Engage community leaders**. Community leaders can provide valuable insight into perceptions among the community regarding health interventions and technologies. Of note, both male and female community leaders, as well as representatives from different religious and social groups should be consulted as perceptions may differ among people of different backgrounds.

Essential tasks: Post-emergency phase

Task 1: Ensure equity

Services should be physically, socially, and financially accessible to everyone. People with similar needs should have equal access to similar health services. At an early stage, engage in recovery planning, focussing on fast 'return to normality' and re establishment of livelihood. This reduces dependency, and the need for health care. To ensure equal access, the distribution of resources and coverage of primary health care services should be greatest in those areas with the greatest need.

Task 2: Utilise an inter-sector approach

Primary health care requires a co-coordinated effort with other *health-related sectors* whose activities impact on health e.g., agriculture, water and sanitation, housing, transportation, education, etc. This is necessary to achieve fast recovery, re establishment of livelihood and social and economic development of a population. The health sector should lead this effort. The commitment of all sectors may increase if the purpose for joint action and the role of each sector is made clear to all concerned.

Task 3: Expand health promotion and prevention services

Primary Health Care services that are implemented in the acute phase of the emergency should be expanded in size and scope as the situation evolves into the post-emergency phase. Examples include expanding immunization coverage to include all vaccines suggested by the WHO Expanded Programme on Immunizations (EPI) and expanding maternal and child health care to include reproductive health. As a goal, primary health systems should be at minimum equal to that which was available prior to the public health emergency.

Sphere Indicators

Figure 2-22: Sphere indicators for Primary Health Care

▪ All people have access to health information that allows them to protect and promote their own health and well-being.

▪ Health services are provided at the appropriate level of the health system: household/community, peripheral health facilities, central health facilities, referral hospital.

▪ A standardised referral system is established by the lead health authority and utilised by health agencies. Suitable transportation is organised for patients to reach the referral facility.

▪ Health services and interventions are based on scientifically sound methods and are evidence-based, whenever possible.

▪ Health services and interventions utilise appropriate technology, and are socially and culturally acceptable.

Clinical services

Sphere standard

People have access to clinical services that are standardised and follow accepted protocols and guidelines.

Purpose/Rationale

The major goal of clinical services in a public health emergency situation is to reduce excess morbidity and mortality by working with and strengthening the local health care system's capacity. Affected populations' health needs vary depending on the:

- Nature of the emergency;
- Populations' basic vulnerability;
- Geographic location;
- Demographic make-up;
- Underlying health of the population; and
- Strength of the local clinical service delivery system.

While each situation is unique, general principles hold true and serve as a foundation for the delivery of clinical services to populations affected by all types of public health emergencies. The basic principles of clinical services in a public health emergency are to:

- Define the population affected;
- Determine the health needs of this population;
- Institute standardised interventions to best respond to these health needs; and
- Do so in an evidence-based manner that is respectful of local culture and dignity.

Essential tasks: emergency phase

Figure 2-23: Tasks to provide clinical services

- Ensure that health facilities are appropriate to meet the needs of the affected population;
- Staff each health facility with a good gender/ethnic balance of workers that reflects the affected population;
- Ensure an adequate number and that there is the appropriate type of staff to meet the health demands of the population without overworking the health workers;
- Monitor the utilization rates of the health facilities and take corrective measures if there is over- or under-utilization;
- Support the lead health authority in establishing standardised case management protocols an;
- Train clinical staff to utilise these protocols to deliver patient care;
- Utilise a list of essential medications as established by the lead health authority;
- Train clinical staff in the use of these medications;
- Employ a standardised drug management system;
- Accept drug donations only if they are needed and accepted into the host country and that they follow internationally recognised guidelines; and
- Dispose of diseased bodies in a manner that is culturally acceptable and ensures pubic health. (see WHO/ICRC/IFRC/PAHO 2006 guidelines).

Task 1: Ensure that health facilities are appropriate to meet the needs of the affected population

There are two issues to clarify: to what extent:

- Extent the disaster has made health institutions inoperable; and
- Does the health staff find it difficult to cope with the workload caused by the disaster?

Quantify the needs of the affected population. The immediate needs are again different depending on the public health emergency's nature. The best way to identify quickly emergent needs is by rapid-assessment surveys and a strong health information system. Rapid-assessment surveys recognise vulnerable groups within the population and identify the most common causes of morbidity and mortality. Rapid-assessment is discussed in depth in other sections of this chapter.

Ensure that the types of health services meet the population's needs which are always different depending upon the context. It is generally the lead health authority's responsibility to ensure that the overall level of clinical services is appropriate for a given situation. The response to any public health emergency should include clinical services provided at a minimum of four levels:

- The community level;
- The peripheral level;
- A central health facility level; and
- A referral hospital level.

Examples of the types of facilities and clinical services are provided in Table 2-5. Any clinical health services implemented by outside or collaborating agencies should strengthen and work within the local health care system.

The tsunami operation in Sri Lanka - Relief programmes
A group of displaced women at Kaluthawalai camp in Batticaloa prepare lunch for 9,000 displaced people.
Photo: A. Lathuraj/International Federation

Table 2-5: Levels of clinical services[3]

Level of care	Example of service provider	Roles and health services provided
Community	Community health workers (CHW)	Members of the community who are integrated into primary health care programmes after short training on health related issues to act as direct intermediaries between the community and structured health care services. CHW may be recruited as paid staff or act as volunteers.
Peripheral	Dispensary or health post	Health facilities where community trained health workers offer a limited range of ambulatory care including treatment of minor injuries/ailments, immunisation, and referral of more complex cases. A health post is generally run by medical auxiliaries (medical, nurse, and technician assistance who do not have the full training of the respective professional staff) and community health workers.
Central	Health centre	First contact of the community with the formal health care system. Not usually staffed by medical officers, rather, is run by medical assistants and other professional staff. Offers ambulatory care, limited in-patient care and reproductive care, community outreach services, and referral of emergent/complex conditions.
Referral	District hospital	Health facilities with the capacity to manage first referral cases but for limited medical disciplines including emergency surgical and obstetric care, follow up, inpatient, and rehabilitative care. Facilities include laboratory, blood bank, and x-ray services.

Base clinical service capacity on population. While the specific clinical service requirements are unique to every public health emergency, the Sphere Handbook provides general guidelines to determine appropriate capacity based on the size of the affected population:[27]

- One community health worker per 500 to 1,000 persons;
- One peripheral level facility per 5,000 to 10,000 persons;
- One central level facility per 30,000 to 50,000 persons or one per every 10km; and
- One referral level facility per 150,000 to 300,000 persons.

If these guidelines cannot be met in the initial stages of the public health emergency, they should be used as goals to be met at the earliest possible stage.

Task 2: Staff teach at health facilities so that the gender/ethnic balance of the workers reflects that of the affected population

Ensure that the gender and ethnic balance among staff is representative of the community being served.

The access to health services by females and people of ethnic or religious minorities might be limited if they are not represented in the health staff. Even relatively small female and minority representation among health staff will increase access to health services for significant segments of the population. It should be noted that in some countries, there will be no access to female patients at all except for female health

workers. Knowing the population's language is also vital. Special attention is required for the demographic composition of community health worker teams who must establish personal relationships and enter the homes of community members.

Task 3: Make certain that there is an adequate number and appropriate types of staff to meet the health demands of the population without overworking the health workers

Ensure adequate staffing numbers at each level of clinical services.

At every clinical services level, there must be an adequate number of appropriately trained individuals to meet the demands placed upon them by the population. Sphere provides guidelines (Table 2-6) for the number of trained health workers required by level. These numbers are guidelines only and should be adapted according to context. Remember one critical factor is often forgotten: language. Translators and local staff are absolutely crucial.

Table 2-6: Recommended staffing levels by level of health service27

Level of health service	Recommended staffing levels
Community	One community health worker per 500-1,000 population; One skilled/traditional birth attendant per 2,000 population; One supervisor per 10 home visitors; one senior supervisor.
Peripheral	A total of two to five staff; minimum of one qualified health worker (defined as a formally trained clinical provider, such as a physician, nurse, clinical officer or medical assistant), based on one clinician per 50 consultations per day; non-qualified staff for administering oral rehydration therapy, dressings, etc. and for registration, administration, etc.
Central	A minimum of five qualified health workers and a minimum of one doctor; one qualified health worker per 50 consultations per day (out-patient care); one qualified health worker per 20-30 beds, 24-hour services (in-patient care). One non-qualified health worker for administering ORT; one/two for pharmacy; one/two for dressings, injections, sterilization. One lab technician. Non-qualified staff for registration, security, etc.
Referral	At least one doctor with surgical skills and one nurse for 20-30 beds per shift.

Strengthen staff's clinical skills.

A programme to strengthen clinical skills is needed. This is especially important if the health system is using refugee health workers with uncertain skills or who are unfamiliar with the host country's local health system and standard guidelines.

Arrange for 'down time' of clinical staff and avoid overwork.

Arrange staffing levels for staff members to have adequate:

- Rest time;
- Training;
- Sick days; and
- Vacations to deal for example with family issues.

Ensure that local staff also has adequate time off.

Compared to those working fewer hours and seeing fewer patients, overworked clinical staff are:

- Less productive;
- Have lower morale; and
- Might provide inferior care.

If clinicians are consistently required to provide consultations on more than fifty patients per day, additional clinical staff should be recruited.

Note: Any newly recruited staff must be trained appropriately. It is inappropriate in order to reduce the workload on other clinicians to employ an individual who is unable to provide a specific level of clinical care safely and professionally.

Note: International intervention teams are different to their host country counterparts. Nurses are a valid example: most of the time, western training and responsibilities are greater than the responsibilities of their counterparts in developing countries especially. Identify among your counterparts or local employees those that are trained, for what they are trained and what they are actually allowed to do.

Figure 2-24: Determining the number of consultations per clinician per day

Definition: Average number of total consultations (new and repeat cases) seen by each clinician per day.

Formula: Total number of consultations (new and repeat) ÷ Number of days health facility is open per week.

Number of full time equivalents (FTE)*

* FTE refers to the number of clinicians working in health facility. For example, three full time clinicians plus four half time clinicians equals a total of five FTE clinicians.

Example Calculation: A clinic is staffed by two full time and two part time clinicians and is open five days per week. In a normal week, there are a total of 850 new and repeat consultations seen. The number of consultations per clinician per day is given by:

$850 \div 5 / 3 = 57$

In this example therefore, each clinician sees an average of fifty-seven consultations per day and thus new staff should be recruited.

Task 4: Monitor the utilization rates of the health facilities and take corrective measures if there is over or under utilisation

Understand that utilisation rates are not constant. Utilisation rates are given in terms of visits to a health facility per person per year. These rates are not constant and may vary based on the phase of the emergency, population demographics and season etc. Utilisation rates generally increase in displaced populations and populations affected by other public health emergencies. As services are started, there might be a great demand for unmet needs. This is likely to reduce. The demand for services might, also, be higher in children.

Utilization of specific types of health care and facilities can be dramatically different based on the nature of the emergency. An earthquake results in relatively larger numbers of broken bones, fractures and crush injuries whereas a famine in severe malnutrition and can lead to an increase in infectious diseases because of overcrowding and poor sanitation. After a large earthquake, utilisation rates for fracture and musculoskeletal services will be higher than other causes. Note, however, that levels of trauma are seldom as great in absolute numbers as one might expect, even in the beginning of an emergency.

Problems with rape and domestic violence, however, can provide a permanent need for trauma services.

Generally, utilisation rates among stable populations have approximately 0.5-1.0 new consultations per person per year. Among displaced populations, there are approximately 4.0 new consultations per person per year. [27]

Figure 2-25: Example of unusual health needs following an earthquake

On December 26, 2003, an earthquake measuring 6.8 on the Richter scale destroyed the city of Bam in southeast Iran. Over 20,000 homes were destroyed; more than 40,000 out of 90,000 people living in the city died in the acute phase and close to 30,000 were injured. A referral hospital in the capital of Tehran reported a series of unscreened patients who were transferred for care. Nearly 47% of patients had lower limb fractures and nearly 30% had upper limb fractures. A large percentage of limb fractures were associated with nerve injuries. Approximately 15% of the injured suffered head injuries. [29]

Calculate the utilisation rates for health facilities. If utilisation rates fall below what is expected, it could indicate that populations in need might have quite inadequate access to health facilities. Reasons for limited access can include an inadequate number of staff;

- Under-staffed facilities;
- Poor security; and
- Barriers based upon gender, age or ethnic group.

If utilisation rates exceed those expected, it could indicate an underestimation of the size of the affected population or a specific public health problem such as broken bones from an earthquake or a diarrhoea outbreak among children. Utilisation rates should be re-calculated on a weekly or monthly basis because they change over time as the public health emergency evolves.

Figure 2-26: Determining the health facility utilisation rate

Definition: The number of out-patient visits per person per year. Whenever possible, a distinction should be drawn between new and old visits. New visits should be used to calculate this rate. However, it is often difficult to differentiate between new and old visits because they are frequently combined as total visits during a disaster.

Formula: $\dfrac{\text{Total number of visits in one week}}{\text{Total population x 52 weeks}}$ = visits/person/year

Example: There are 350 visits to health facilities serving a displaced population of 5,000 people.

     Utilization Rate = $\dfrac{350}{5,000 \text{ x } 52}$ = 3.64 visits per person per year

The utilization rate is 3.64, which is just less than the expected value of approximately 4.0 visits per person per year. This could indicate that the population is adequately served at the present time.

Take corrective measures if there is over- or under-utilisation of health facilities. If the utilisation rate reveals that there is significant over- or under use of health facilities, corrective measures must be taken.

In cases of apparent overuse, health information systems can identify the most common causes for visits to health facilities. This information can be used for the appropriate redirection of resources. If a diarrhoeal outbreak is identified as the cause of a high utilization rate, community health workers can be trained to deliver and teach parents the

correct use of oral rehydration solution. If there is a lower than expected utilisation rate, the system must be evaluated and the barriers to health care identified and removed.

Ensure that vulnerable groups are not under represented among health facility attendees. Good record keeping and health information systems can be used to ensure that vulnerable groups such as the elderly, ethnic minorities, the disabled, females etc, have utilisation rates that are similar to the general population. If vulnerable groups' utilisation rates significantly differ from those of the general population, vulnerable groups' community leaders should be engaged to identify and remove the barriers to health care promptly.

When planning, take into account the time factor: the patient load after an earthquake or sudden impact disaster peaks between the first three to six weeks. The sequence of injuries can be reduced dramatically in this period but is replaced by more and more chronic disease problems.

Task 5: Support the standardised case management protocols and train clinical staff to utilise these protocols to deliver patient care

Follow case management protocols. Most countries have standardised case management protocols for treatment of common medical and surgical conditions. They are often not well known by doctors, however, and are ignored to a great extent because local doctors consider them to be outdated. Utilise the WHO standard protocols until the ministry of health protocols are confirmed would be the safest way. Protocols are designed to ensure a high and consistent level of care and should be followed by all agencies providing clinical health services.

Review with the lead health authority case management protocols to determine their appropriateness. Case management protocols are designed for and used in non-public health emergency situations. Review with the lead health authority these protocols early in a new public health emergency response to determine their appropriateness in the specific conditions currently being faced. If the ministry of health is not serving in the position of lead health authority or if the host country's designed case management protocols are not available, protocols designed by the entity serving as lead health authority, usually WHO, UNHCR, UNICEF or other UN agencies, should be adapted to the given situation. WHO and multiple collaborating agencies, including the Red Cross/Red Crescent Society, have published management protocols that were updated in 2006 for acute respiratory infections, diarrhoea, malaria, malnutrition, sexually transmitted infections, TB and other conditions met in public health emergencies.[42] Certain management protocols, for example for malaria, must be adapted to the local context as drug resistance patterns preclude the application of universal protocols.

Train and supervise health care deliverers adequately. All health agencies responding to the public health emergency must adequately train health care providers to follow case management protocols in a safe, effective and professional manner. Health care workers' knowledge and skills must be up-to-date and evidence-based. Special attention must be paid to training and supervision where medical education and continuing education have been limited or new protocols introduced. Training and supervision should be based on standards set by the lead health authority and should serve to work within and strengthen the local health care system.

Maintain an ethical standard of health care. Obtain informed consent. In a public health emergency, it is difficult to maintain patient privacy and confidentiality consistently and obtain informed consent for procedures and treatments. Maintaining the highest ethical and professional standards of health care delivery, even in the midst of a public health emergency, is essential to providing the high quality care and maintaining the trust of both patients and communities. Standard informed consent, consisting of an explanation of the nature of a procedure/treatment, a summary of the benefits, risks and alternatives must be obtained from each patient. Where this might be impossible the patient being a child or unconscious, every reasonable effort should be made to obtain informed consent

from an immediate family member. In all too many countries, it is the husband or the father who gives consent for his children, his wife or wives.

Task 6: Ensure an adequate and quality supply of essential medications consistent with the host country's essential drug programme, and train clinical staff in the use of these medications

Adhere to the standardised essential drug list established by the lead health authority. Similar to the standardised case management protocols above, the lead authority will also establish a list of essential drugs. The list will contain a group of medications for common and serious conditions that are likely to be met in the emergency phase. The medication list can be tailored to the specific geographic location and the nature of the public health emergency: for example, malaria medications may differ by geographic location based on local resistance patterns.

Essential medications can be defined as:

Those that satisfy the priority health care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety and comparative cost effectiveness. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.[42]

Mobile Red Crescent health clinics have been distributing chlorine tablets, mosquito nets and soap, and have disseminated information about hygiene and health promotion to more than 49,000 people. Hundreds of Red Crescent volunteers have also distributed thousands of tents. Photo: Nawal Hassan/Sudanese Red Crescent

2

Health systems and infrastructure

*Table 2-7: Example of drugs included in the interagency emergency health kit, supplementary unit[42] ***

Anaesthetics
- ketamine, inj 50 mg/ml 10 ml/vial 25
- lidocaine, inj 1%13 20 ml/vial 50

Analgesics
- morphine, inj 10 mg/ml15 1ml/ampoule 50
- ibuprofen, tab 400 mg (10 x 2,000) 20,000
- paracetamol, tab 100 (10 x 1000) 10,000
- paracetamol, tab 500 mg (10 x 2,000) 20,000

Antiallergics
- hydrocortisone, powder for inj 100 mg vial 50
- prednisolone, tab 5 mg tab 100

Antidotes
- calcium gluconate, inj 100mg/ml16 10 ml/ampoule 4
- naloxone, inj 0.4 mg/ml 17 1 ml/ampoule 20

Anticonvulsants/antiepileptics
- diazepam, inj 5 mg/ml 2 ml/ampoule 200
- magnesium sulfate, inj 500 mg/ml 10 ml/ampoule 40
- phenobarbital, tab 100 mg tab 500

Anti-infective medicines
- benzathine benzylpenicillin, inj 2.4 million IU/vial (long-acting penicillin) vial 50
- benzylpenicillin, inj 5 million IU/vial18 vial 250
- ceftriaxone, inj 1 g vial 800
- cloxacillin, caps 500 mg19 caps 1,000
- clotrimazole, pessary 500 mg pessary 100
- doxycycline, tab 100 mg tab 3,000
- metronidazole, tab 500 mg
- miconazole, muco-adhesive tab 10mg20 tab 350
- procaine benzylpenicillin, inj 3-4 million IU/vial21 vial 200
- albendazole, tab 400 mg (10 x 200) 2,000
- amoxicillin, tab 250 mg (10 x 3,000) 30,000

Malaria module
- artemether, inj 20 mg/ml22 1ml/ampoule 200
- artemether, inj 80 mg/ml 22 1ml/ampoule 72
- quinine dihydrochloride, inj 300 mg/ml23 2 ml/ampoule 100
- artemether + lumefantrine, tab 20 mg+120 mg (10 x 6,120 tab) 61,200
- quinine sulfate, tab 300 mg (10 x 2,000) 20,000
- rapid diagnostic tests (10 x 800) 8,000
- lancet for blood sampling (sterile) (10 x 1000) 10,000
- safety box for used lancets, 5 litres (10 x 2) 20

Medicines affecting the blood
- folic acid, tab 5 mg tab 1,000
- ferrous sulfate + folic acid, tab 200 mg + 0.4 mg

Cardiovascular medicines
- atenolol, tab 50 mg tab 1,000
- hydralazine, powder for inj 20 mg24 ampoule 20
- methyldopa, tab 250 mg25 tab 1,000

Dermatological medicines
- polyvidone iodine, solution 10% bottle, 200 ml 10
- silver sulfadiazine, cream 1% tube, 50 g 30
- miconazole, cream 2% tube, 30 g 25
- benzyl benzoate, lotion 25% (10 x 1L) 10
- gentian violet, powder 25 g (10 x 4) 40
- tetracycline, eye ointment 1% (10 x 50) 500

Disinfectants and antiseptics
- sodium dichloroisocyanurate (NaDCC), tab 1.67 g26 tab 1,200
- chlorhexidine, solution 5% (10 x 1L) 10

Diuretics
- furosemide, inj 10 mg/ml 2 ml/ampoule 20
- hydrochlorothiazide, tab 25 mg tab 200

Gastrointestinal medicines
- promethazine, tab 25 mg tab 500
- promethazine, inj 25 mg/ml 2 ml/ampoule 50
- atropine, inj 1 mg/ml 1 ml/ampoule 50
- aluminium hydroxide + magnesium hydroxide, tab 400 mg + 400 mg (10 x 1,000) 10,000

Oxytocics
- oxytocin, inj 10 IU/ml27 1 ml/ampoule 200

Psychotherapeutic medicines
- chlorpromazine, inj 25 mg/ml 2 ml/ampoule 20

Respiratory tract, medicines acting on
- salbutamol, tab 4 mg tab 1,000
- epinephrine (adrenaline), inj 1 mg/ml 1 ml/ampoule 50

Solutions correcting water, electrolyte and acid-base disturbances
- compound solution of sodium lactate (Ringer's lactate), inj. solution, with IV giving set and needle 500 ml bag-200 count;
- glucose inj. solution 5%, with IV giving set and needle 500 ml bag-100 count;
- glucose, inj. solution 50%, 50 ml/vial- 20 count
- water for injection 10 ml/plastic vial-2,000 count
- oral rehydration salts, sachets (10 x 200) -2,000

Vitamins
- retinol (vitamin A), 200,000 IU caps- 4,000
- ascorbic acid, 250 mg tab – 4,000

Note: *that the supplementary unit must not be used without the basic unit(s).*
Sufficient for the needs of 10,000 people in an emergency situation for three months.

Train health care providers in the appropriate use of the medications included in the essential drug list. Similarly to the standardised case management protocols above, all health agencies must train providers in the safe and appropriate use of medications. Training is based on standards set by the lead health authority and serve to strengthen the local health system.

Task 7: Employ a standardised drug management system

Utilise a standardised drug management system. Its goal is to ensure the efficient, cost-effective and rational use of drugs.[27] Rational and evidence-based use of medications is particularly important in emerging and re-emerging diseases along with the increasing resistance to commonly used drugs. The drug management system should be instituted by the lead health authority and be based upon the four key elements of the drug management cycle:

▪ Selection;
▪ Procurement;
▪ Distribution; and
▪ Use. [21]

Figure 2-27: Essential drugs and medical supplies policy of the International Federation of Red Cross and Red Crescent Societies[13]

The International Federation of Red Cross and Red Crescent Societies has adopted a comprehensive policy on essential drugs that includes vaccines and medical supplies to meet vulnerable populations' needs. The policy directly addresses the elements of the drug management cycle:

▪ Implement an essential drugs programme as part of the broader health policy to attain the goal of health for all based on the primary health care strategy. National Societies shall be involved in the implementation of an Essential Drugs Programme when needs and conducive situations prevail;

▪ The International Federation shall base selection of drugs and medical supplies primarily on the national list of essential drugs. Where such a list is non-existent or incomplete, the WHO list of essential drugs can be used to focus on the basic health needs of the target population;

▪ Use the international non-proprietary names (generic drugs) in drug selection and procurement whenever feasible;

▪ Adopt a procurement strategy to ensure the availability of drugs of good quality, safety and efficacy at the lowest possible price without undermining financial sustainability;

▪ Apply the WHO Certification Scheme on the quality of pharmaceutical products in international commerce and other feasible methods for assessing the quality of pharmaceutical products in the process of procurement;

▪ Undertake all measures for organising proper storage and a distribution system that safeguards managerial efficiency and ensures adequate quality of the pharmaceuticals at all levels;

▪ Request donors to observe the obligation of providing good quality, essential drugs that have an acceptable range of shelf-life;

▪ Adopt the WHO guidelines for drug donation and take all possible measures to ensure their application at all levels;

▪ Support the rational use of essential drugs and medical supplies by promoting rational procurement, distribution, prescription, dispensing and consumption of pharmaceutical products at all levels. To attain this, organise educational activities for selected categories of health care workers and consumers in collaboration with national and international organisations. Formulate the guidelines that will assist the establishment of a sound supply and management system;

- Undertake activities at country level to support line ministries to develop national drug policies and legislation. These must promote the concept of essential drugs and participate in the implementation of such drugs in possible areas; and
- Take appropriate measures complying with national and international guidelines for the timely disposal of expired and unwanted drugs.

Task 8: Accept drug donations only if they follow internationally recognised guidelines

Ensure that donated drugs are needed and accepted in the host country rather than just checking that they meet internationally recognised guidelines. In a public health emergency's aftermath, many countries and organisations donate medications to health and aid agencies that are participating in the emergency phase of relief. The drug donation guidelines are provided below.

Figure 2-28 Guidelines for drug donation in a public health emergency [42, 40]

Selection of drugs:
- All drug donations must be based on an expressed need and be relevant to the disease pattern in the recipient country. Drugs should not be sent without prior consent by the recipient;
- All donated drugs or their generic equivalents must be approved for use in the recipient country and appear on the national list of essential drugs. If a national list is not available, use the WHO Model List of Essential Drugs, unless specifically requested otherwise by the recipient; and
- The presentation, strength and formulation of donated drugs must as much as possible be similar to those of drugs commonly used in the recipient country.

Quality assurance and shelf-life:
- All donated drugs must be obtained from a reliable source and comply with quality standards in both the donor and recipient countries. The WHO Certification Scheme on the Quality of Pharmaceutical Products Moving in International Commerce must be used;
- No drugs must be donated that have been issued to patients and then returned to a pharmacy or elsewhere or were given to health professionals as free samples; and
- After arrival in the recipient country, all donated drugs must have a remaining shelf life of at least one year. An exception can be made for direct donations to specific health facilities, provided that: responsible professionals receiving them acknowledge that they are aware of the shelf-life and that the quantity and remaining shelf-life allows for proper administration before expiration. In all cases, it is important that the drugs' dates of arrival and of expiry be communicated to the recipient well in advance.

Presentation, packing and labelling
- All drugs should be labelled in a language that is easily understood by health professionals in the recipient country. The label on each individual container should at least contain the International Non-proprietary Name (INN) or generic name, batch number, dosage form, strength, name of manufacturer, quantity in the container, storage conditions and expiry date;
- Donated drugs should be presented as much as possible in larger quantity units and hospital packs; and
- All drug donations should be packed in accordance with international shipping regulations and be accompanied by a detailed packing list which specifies the contents of each numbered carton by INN, dosage form, quantity, batch number, expiry date, volume, weight and any special storage conditions. The weight per carton should not exceed fifty kilograms. Drugs should not be mixed with other supplies in the same carton.

Information and management
- Recipients should be informed of all drug donations that are being considered, repaired or actually under way;
- The declared value of a drug donation should be based upon the wholesale price of its generic equivalent in the recipient country, or, if such information is not available, on the wholesale world-market price for its generic equivalent;

> ▪ Costs of international and local transport, warehousing, port clearance, appropriate storage and handling should be paid by the donor agency unless specifically agreed otherwise with the recipient in advance; and
>
> ▪ A generic drug cannot be accepted, unless the production that has been approved in the host country. E.g. at one point, the Iraq MoH did not allow Metronidazole to be imported as a generic drug, but Flagyl was accepted.
>
> ▪ Dispose of drugs that do not meet donation guidelines.
>
> **Note:** Refer to source, the Interagency Health Kit (IEHK) 2006 for justifications, explanations and exceptions.

If medications that do not meet the internationally accepted guidelines are donated, they should not be used but be disposed safely in a manner consistent with the methods used in the host country.

Task 9: Dispose of diseased bodies in a manner that is culturally acceptable and ensures pubic health

Dispel myths about the health risks posed by dead bodies.

It is commonly reported that dead bodies are a significant potential source of infection and are thus a great public health risk. This, however, is rarely the case. In the majority of acute mass casualty incidents such as a large earthquake or a tsunami, the major cause of death is trauma. In these cases, there is a very small to negligible risk of disease transmission from bodies. Large numbers of diseases bodies that are not disposed of promptly, however, do pose a significant mental health risk to the surviving population. There are several situations in which bodies do pose an infection risk. These include cases in which the cause of death was a hemorrhagic fever such as Ebola, a diarrhoeal disease such as cholera or a flea born disease such as plague or typhus. Hemorrhagic fevers are transmitted easily through body secretions including blood. High levels of protection are required for those disposing of these bodies. Disposal of bodies deceased due to cholera require very careful attention to hand hygiene such as frequent washing with soap. Disposal of bodies deceased due to plague and typhus require hand hygiene and body bags to prevent transmission by infection-carrying fleas. To ensure safety, workers disposing bodies must adhere to the universal precautions.

Avoid mass burials and mass cremations whenever possible.

Bodies should not be disposed of unceremoniously in mass graves or cremations. This is not justifiable on public health grounds (see above) but it is also not culturally acceptable.

Note: In cases of tremendous mass casualties, communal burials may be used as in Sri Lanka and Indonesia after the December 26, 2004 tsunami. If communal burial must be used, graves must be clearly marked and bodies be buried in a single layer so that later exhumations can be easily done.[17]

Give families the opportunity to conduct culturally appropriate funerals, burials or cremations.

Generally, cultural and religious practices of the living relatives should determine the manner of body disposal.

Consider forensic issues when the deceased is a victim of violence.

In situations of conflict or genocide, forensic evidence from the deceased might be used in later legal proceedings. If possible in a violent death, obtain photographs and documentation of the state of the body. This information can prove invaluable. Identification, tagging of the body and documentation of the site of burial will allow for future exhumations if required.

Give priority to the living over the dead.

In mass casualty incidents, it is easy to be overwhelmed by the scale and scope of death. All agencies and individuals involved in the response must always remember, however, to take the simple step of giving priority to the living over the dead.

Essential tasks: post-emergency phase

Task 1: Continue to support national health systems in delivering clinical services

As the transition is made from emergency services and attempting to minimise immediate mortality, participating health agencies should continue supporting and building the local health care delivery system's capacity. Delivery of clinical services should shift from humanitarian and international health organisations to the country's own system. The goal is for host country clinical services to be at least as strong as or ideally even stronger than it was before the public health emergency.

Task 2: Transition from emergency clinical services

In the transition from emergency to post-emergency phase, the health needs of the population will change. The post emergency phase will have a shift from emergency clinical services to sustainable long-term clinical care. Fewer resources, both human and material, will be required for infectious disease outbreaks, orthopaedics for musculoskeletal trauma, etc. but more resources will be required for clinical care of chronic diseases, reproductive health and primary care.

Sphere indicators

Figure 2-29: Sphere indicators for clinical services

- The number, level and location of health facilities are appropriate to meet the needs of the population;

- The number, skills and gender/ethnic balance of staff at each health facility are appropriate to meet the needs of the population;

- Adequate staffing levels are achieved so that clinicians are not required to consistently consult on more than fifty patients per day. If this threshold is regularly exceeded, additional clinical staff is recruited;

- Utilisation rates at health facilities are monitored and corrective measures taken if there is over- or under-utilisation;

- Standardised case management protocols are established by the lead health authority, and adhered to by health agencies;

- A standardised essential drug list is established by the lead health authority, and adhered to by health agencies;

- Clinical staff are trained and supervised to use the protocols and essential drug list;

- People have access to a consistent supply of essential drugs through a standardised drug management system that follows accepted guidelines;

- Drug donations are accepted only if they follow internationally recognised guidelines. Donations that do not follow them, will not be used, but disposed of safely; and

- Bodies of the deceased are disposed of in a manner that is dignified, culturally appropriate and is based on good public health practice.

Health information systems

Sphere standard

> **The design and development of health services are guided by the ongoing, coordinated collection, analysis and utilization of relevant public health data.**

Purpose/Rationale

Health information is critical to a health system's functioning.[31, 32] A health system approach to addressing emergencies, therefore, requires significant attention to Health Information Systems (HIS). HIS in emergencies determines priorities and allocates resources accordingly.[31] In the emergency phase however, there may not be any HIS. The priority would be to establish HIS quickly. This section of the chapter on Health Services describes the key tasks in establishing and supporting HIS during an emergency and post-emergency. Before turning to these tasks, it may be helpful to review a definition of HIS in emergencies.

HIS in emergencies is a set of data collection platforms implemented by a coordinated group of humanitarian actors generating information to support strategic decisions, monitor changes, prioritise action and allocate resources, manage programmes, scaling up or down operations, advocate and formulate concerns in relation to an emergency context.'[31 (pg. 585)]

Essential tasks: emergency phase

Figure 2-30: Tasks to establish and support a health information system

- Work with the designated HIS coordinating agency to coordinate and standardise data collection and interpretation;
- Calculate the crude and under-five mortality rates;
- Calculate other key rates of mortality, morbidity and health services utilization;
- Disaggregate data by age and gender as soon as possible;
- Submit recommended standard surveillance data to the designated HIS coordinating agency as scheduled;
- Help HIS to detect of infectious disease outbreaks.
- Monitor health programmes for vaccination, feeding and reproductive health;
- Protect data to ensure individuals and populations' rights and safety; and
- Triangulate HIS information with other data sources whenever possible.

Task 1: Work with the designated HIS coordinating agency to coordinate and standardise data collection and interpretation

Coordinate with the agency responsible for HIS in the emergency.

The health information system used by all health agencies in an emergency must be standardised. A lead agency, often the ministry of health, will establish the standards for HIS. Assignment of a lead agency is the first step in developing HIS during an emergency.[4] typically, one of WHO's roles in emergencies is providing technical assistance to the lead agency in the design and function of HIS

Use standard case definitions, data collection and reporting forms. These standards should come from the agency given responsibility for coordinating HIS during the emergency.

Figure 2-31: Key steps for lead agency responsible for development of an HIS in an emergency

- Assign primary responsibility for HIS coordination to a person or agency;
- Establish a chain of information transmission and means of communication;
- Define disease control programme objectives and quantify targets;
- Identify essential data categories demography, mortality, morbidity, nutrition and programme indicators;
- Develop and field test case definitions;
- Design and test simple data collection forms;
- Train personnel involved in data collection;
- Define data compilation, entry and analysis methods;
- Develop feedback mechanisms e.g. a newsletter; and
- Evaluate and adapt system periodically.

Task 2: Monitor crude and under-five mortality rates

Crude mortality rates and under-five mortality rates are the key impact indicators for the emergency response effort.[27, 32, 5, 10] These rates are thresholds to define a situation as an emergency or not. These rates are also used to monitor and evaluate the relief effort. Different organisations use different thresholds, however. Table 2-8 developed by Checchi and Roberts (2005), shows three different sets of thresholds for defining emergencies using these two rates.

Table 2-8: Mortality thresholds used to define emergency situations[5]

Agencies	Assumed baseline	Emergency thresholds
Centers for Disease Control, Médecins Sans Frontièrs, Epicentre, Academia	CMR: 0.5 per 10,000 per day U5MR: 1 per 10,000 per day	CMR ≥1 per 10,000 per day U5MR ≥ 2 per 10,000 per day
UNHCR	CMR: 0.5 per 10,000 per day U5MR: 1 per 10,000 per day	CMR > 1 per 10,000 per day: 'very serious' CMR > 2 per 10,000 per day: 'out of control' CMR > 5 per 10,000 per day: 'major catastrophe' (double for U5MR thresholds)
Sphere project	Context-specific CMR (U5MR): Sub-Saharan Africa: 0.44 (1.14) Latin America: 0.16 (0.19) South Asia: 0.25 (0.59) Eastern Europe, Former Soviet Union: 0.30 (0.20) Unknown baseline: 0.5 (1.0)	Emergency if CMR (U5MR): Sub-Saharan Africa: 0.9 (2.3) Latin America: 0.3 (0.4) South Asia: 0.5 (1.2) Eastern Europe, Former Soviet Union: 0.6 (0.4) Unknown baseline: 1.0 (2.0)

Figure 2-32: SMART initiative

The U.S. Agency for International Development (USAID) in collaboration with the U.S. Department of State's Bureau of Population, Refugees and Migration (State/PRM) and the Canadian International Development Agency (CIDA), initiated the Standardised Monitoring of Relief and Transitions (SMART) SMART is an inter-agency initiative that includes most types of humanitarian organisations, donors, international and UN agencies, PVOs and NGOs, universities, research institutes and local partners. There has been a consensus among SMART participants on the use of Crude Mortality Rate (CMR) and Nutritional Status of Under-Five Children as benchmark indicators for humanitarian assistance.

Much of the recent effort in the SMART initiative has focused on developing tools and systems to help standardise methodologies for reliable and valid assessment of mortality and nutritional status plus food security to help ensure the data is used for decision making and reporting. User-friendly manuals and software for application of these tools can be found at the SMART website at http://www.smartindicators.org/index.html

Determine the size of the beneficiary population and the number of children under five. This is a difficult task in emergency situations. Estimates of population size are often over-estimated and sometimes under-estimated.[14, 30] A detailed description of commonly used methods are beyond the scope of this guide. One of the best references for carrying out this task that at time is available for download from the Internet is Telford's Good Practice Review (1997).[30] Other manuals are forthcoming.

Table 2-9: Common sources of information about the size of the beneficiary population

Formal registration[30, 15]	E.g., Registration for ration cards, births or for new arrivals
Mapping[15]	Estimate the area of the camp in square meters, calculate the population density (one person per x m^2) at several points within the camp and use these numbers to estimate population size
Estimate under-five population size[30]	Estimate the number of children under-five by counting all children with a height below a threshold (e.g., < 110 cm)
Count of services[15]	Count the number of services provided to a target population (e.g., the number of vaccinations given to children under five) and estimate the total population using the target population count as a percentage.
Retrospective mortality surveys[31, 5, 15]	This can provide the numerator and denominator for both mortality rates. Survey the head of a random sample of households (e.g., thirty cluster survey) about household composition, migration and mortality experiences. This is relatively complex due to sample size calculations and selection of recall periods.
Overflights, aerial photography[30]	Count the number of households directly or from photos/images. Combine this information with other estimates about average household size/composition to estimate the total and under-five population.
Census[15]	e.g., a census carried out prior to food distribution.

Figure 2-33: Potential reasons for over- or under-estimation of number of beneficiaries[14]

The number of beneficiaries are often over-estimated because:

- persons in hiding who are not legitimate refugees are not counted,
- individuals register more than once to increase food rations,
- out-migrations and deaths are under-reported,
- members of the local or host population may attempt to register to access services provided to refugees.

However, it is important not to compensate by under-estimating. Remember to count individuals:

- who settle outside camps in the local population but may be hard to find and count,
- who are sick or malnourished do not access services that are being used to count beneficiaries.

Calculate the crude and under-five mortality rates.

A system for recording all deaths is required and another to estimate the total number of the population at risk of dying. Both numbers are needed for the calculation. Retrospective surveys provide the source for the number of deaths and the population at risk of dying. Experienced persons are also needed to calculate the precision of the rates derived from surveys. Please refer to the *Epidemiology and Surveillance* chapter for details on how to calculate these rates.

Table 2-10: Emergency thresholds used by Sphere[2]

Baseline Reference Mortality Data by Region				
Region	CMR (deaths/ 10,000/day)	CMR emergency threshold	U5MR (deaths/ 10,000 U5s/day)	U5MR emergency threshold
Sub-Saharan Africa	0.44	0.9	1.14	2.3
Middle East and North Africa	0.16	0.3	0.36	0.7
South Asia	0.25	0.5	0.59	1.2
East Asia and Pacific	0.19	0.4	0.24	0.5
Latin America and Caribbean	0.16	0.3	0.19	0.4
Central and Eastern European Region/CIS and Baltic States	0.30	0.6	0.20	0.4
Industrialised countries	0.25	0.5	0.04	0.1
Developing countries	0.25	0.5	0.53	1.1
Least developed countries	0.38	0.8	1.03	2.1
World	0.25	0.5	0.48	1.0

Task 3: Calculate other rates on mortality, morbidity and health services utilisation

It is important to calculate proportional and cause-specific morbidity and mortality rates. Data for these indicators is often drawn from information collected at service delivery points such as health facilities, cholera treatment and feeding centres as opposed to

population-based data. This data is sufficient for disease control because the study of trends in rates is still possible.

Task 4: Disaggregate data by age and gender as soon as possible

From the outset, calculate separate mortality and morbidity rates for children under five.

Even though it is difficult to do divide data by age and gender early on in an emergency, the Sphere standard is to do so while data is being collected because the under-five group is considered at high risk for mortality. Standard mortality and morbidity surveillance forms will typically request that data be disaggregated by under-five, five and older. Refer to the sample morbidity and mortality surveillance forms in the Sphere guidelines.[27]

As soon as possible, calculate separate mortality and morbidity rates by gender.

This detects any differences in death and disease by gender and determines if changes in intervention strategies are needed to target those at highest risk. Most standard mortality and morbidity surveillance forms will request data be disaggregated by gender (the Sphere sample forms do).

As the situation permits, further disaggregate mortality and morbidity rates by additional age groups.

Additional disaggregation of mortality and morbidity statistics help identify groups at highest risk and in need of more targeted interventions such as very young children or the elderly. Additional reporting of the following age groups is recommended by Sphere:

- < 1 year;
- 1-4 years;
- 5-14 years;
- 15-49 years;
- 50-59 years; and
- > 60 years.

Task 5: Confirm data quality before use

Interpret and use the data.

Generally, interpretation and analysis of data or information is weak; in emergencies, it is very weak. Well trained and good scientific people look often look for additional data which may delay important decisions; the situation in the early stages is fluid and changing by the hour. Certain decisions must be made based on vague data and on experience taken from how similar situations have developed in the past. There are also those agencies and organisations that rush to the most convenient place and start operating without considering the available information and need patterns. The balance must be found by coordination and the overall coordination body must be respected. In principle, the first week is marred with inaccuracies and data which can only form patterns. Successively, the quality improves, however. But before using any data, its quality must be judged and potential biases assessed. Problems with data quality and potential biases vary on whether surveillance or surveys are the source of mortality data. It is beyond the scope of this guide to provide a detailed overview of common biases. There are specific guides for just this purpose such as the one by Checchi and Roberts (2005) and are available for download from the Internet.[5]

Refer to the Epidemiology and Surveillance section of this guide for an in-depth discussion about calculating population size, mortality and other rates in a public health emergency.

Health systems and infrastructure

2

Task 6: Submit recommended/standard surveillance data to the designated HIS coordinating agency per schedule

Use standard reporting forms to submit surveillance data.

Submit data to the lead Health Information Systems (HIS) agency using the standard formats and procedures. The Sphere guidelines provide examples of weekly mortality and morbidity reports that are likely to be very similar to those requested in any emergency.[27]

Submit standard reports on time.

In most situations, the lead HIS agency will develop a routine mortality and morbidity newsletter (daily, weekly, monthly) with the data included in standard reports. The newsletter will be widely distributed. It is important, therefore, to submit standard reports on time so the epidemiological reports are as informative as possible.

Figure 2-34: The Weekly Morbidity and Mortality Report (WMMR)

Shortly following the Pakistan earthquake of 8 October 2005, the Pakistan ministry of health (MoH) and WHO began publishing The Weekly Morbidity and Mortality Report (WMMR). WMMR is developed from 'surveillance data that health service providers and NGOs transmit on a weekly basis from health facilities and hospitals in those areas affected by the earthquake. WMMR objectives are to monitor the trend of health conditions over a period of time and provide vital information to all health partners. WMMR is only a snapshot of the health conditions in those facilities where events are registered and data collected and does not necessarily reflect the situation from other health facilities. WMMR is a publication that has been developed for emergencies and previously used in other areas such as the Darfur Crisis.'

Source: http://www.reliefweb.int/rw/RWB.NSF/db900SID/KHII-6Q993G?OpenDocument

Task 7: Help the HIS to detect outbreaks of infectious disease in a timely manner

Ensure that the local health information collects information required for outbreak detection.

Obtain case definitions and thresholds used by the lead Health Information Systems (HIS) coordinating agency and ensure they are included in the training of facility and community health workers.

Note: Single cases of cholera, measles, yellow fever, dysentery or viral haemorrhagic fevers can indicate an outbreak.[27] Indications of an outbreak of meningococcal meningitis depend on the population size, time since last outbreak and vaccination status.[*] An outbreak of malaria is more difficult to define but is suspected when the number of cases is more than expected for a defined population at that time of year. There are other diseases like tetanus, which often occurs after floods, hurricanes and earthquakes. Surprisingly, these patterns are often ignored and despite the International Federation's warnings in Pakistan and Yojakarta earthquake operations, the governments were still taken by surprise.

* If the population is less than 30,000, five new cases in one week or a doubling of cases over a three-week period indicate an outbreak of meningococcal meningitis. If the population is greater than 30,000 and has a high outbreak risk with no outbreak in more than three years and vaccination coverage is less than 80%, ten cases per 100,000 per week is an indication of an outbreak. Fifteen cases per 100,000 per week indicate an outbreak in a population greater than 30,000 and without a high outbreak risk.

Report suspected outbreaks within twenty-four hour.

Report suspected outbreaks to the designated health authority (often the next level of the health system). The Sphere standard is to report suspected outbreaks within twenty-four hours of detection. This standard implies that health workers have the ability to communicate with health authorities within this time standard if indicated.

Note: Please refer to the section on Communicable Disease Control as well as the Epidemiology and Surveillance section of this guide for an in-depth discussion about how to investigate and manage disease outbreaks in humanitarian emergencies.

Task 8: Monitor health programmes: vaccination, feeding, reproductive health

As well as mortality and morbidity data, the health information system should monitor key health programmes. At a minimum, the health information system should monitor vaccination and treatment of malnutrition.[32] The health system should also monitor reproductive health services as soon as feasible.

Monitor vaccination coverage rates.

Measles vaccination rates among children aged six months to fifteen years are calculated when monitoring mass measles immunisation campaigns. These rates may be calculated using administrative estimates (the number of doses divided by the estimated number of children between the ages of six months to fifteen years) or by household surveys. Once a routine immunization system is established, coverage rates for the antigens provided should be calculated (typically coverage among children from twelve to twenty-three months of age).

Monitor the number of patients in intensive or supplementary feeding programmes .

Comparing the number of children enrolled in feeding programmes with the estimated number of mal-nourished children (collected from nutrition surveys) can provide an estimate of feeding programme coverage.

Monitor antenatal care attendance.

The number of women attending antenatal care can help estimate programme coverage. For example, compare the number of women attending antenatal care in the last three months with the expected number of women who are pregnant at any one time (see note below).

Figure 2-35: Regional estimates of pregnancies[45]

A review of Demographic and Health Surveys conducted between the years 2000 and 2005 can provide regional estimates of the expected number of women who are pregnant at any time. (Note that these estimates may mask considerable variation within country, especially urban/rural differences). The percentages below indicate the average percentage of women 15-49 who were pregnant at the time of the survey across all surveys in the region:

- Sub-Saharan Africa—10% (19 countries, range 5.8% to 13.8%);

- North Africa/West Asia—5% (3 countries, range 4.0 to 6.3%);

- South and South-East Asia—5% (6 countries, range 4.1 to 7.1%); and

- Latin America and the Caribbean—5% (6 countries, range 4.2 to 7.6%).

Task 9: Protect the data to ensure rights and safety of individuals/populations

Limit individual patient information to those directly involved in the patient's care.

It is difficult to predict the potential misuses of patient information in a given situation. For example, victims of human rights abuses who are treated at a clinic or other service centres might be harmed or threatened, if identified, to prevent abuses from being discovered. The Sphere guideline is not to share patient information with others (those not directly involved in the patient's care), unless the patient gives permission.[27]

Store medical records and other data that identifies individuals in a secure, safe place.

Medical records need to be stored in a place and manner to prevent unauthorised persons from having access to them. Only record information that identifies a patient when it is needed for their health promotion.

Task 10: Triangulate Health Information Systems (HIS) information with other data sources when possible

Cross-check the information obtained by HIS with other data sources.

Cross-checking information from different sources increases confidence in the available data when the results are similar. Other potential sources of data complementary to HIS include laboratories, surveys by other organisations and programme reports from other sectors (nutrition, water and sanitation, shelter, etc.).[27]

Essential tasks: post-emergency phase

Task 1: Evaluate and refine the HIS

Increase quality of the data.

Use or collect complementary information from other sources to assess the accuracy of HIS data. This includes the numbers of events (such as deaths by age) and the denominator used to calculate rates (population size by gender and age group). Other characteristics of data quality include completeness (data or reports), simplicity and timeliness.[4]

Figure 2-36: Suggestions for improving data quality

Rates calculated by the HIS are sensitive to changes in the denominator—the size of the population. Continuously review and adjust population numbers to reflect in- and out-migration. Triangulate population numbers used by HIS with other data sources. For example, a vaccination campaign will often be the best source for the number of persons in the target age group (e.g., six months to fifteen years for measles vaccination). A vaccination coverage survey can be used periodically to validate the vaccination coverage statistics provided by HIS where the number in the target group is estimated.

For mortality reporting, a centralised mortality register is recommended to improve the quality of death reports.[28] A centralised mortality register can improve the accuracy of reporting by standardizing what constitutes a death (e.g. do not include late term abortions or stillbirths) and eliminating double counting of deaths from different sources (assuming sufficient information about deaths are available). To help prevent double counting of deaths and improve ability to report deaths by gender and more age groups, the following data about each death is recommended:

- Name;
- Location of residence;

- Date of death;
- Date of birth (or age of death if unknown);
- Sex;
- Origin (displaced vs. local);
- Cause; and
- Location of death.[28]

Increase coverage of data.

Health Information Systems (HIS) based only on data collected at health facilities can lead to underreporting of events such as mortality.[28] Underreporting may be across the whole population or for certain segments of the population (e.g. women, children). Expand the sources of information, especially mortality and nutrition information beyond camp health facilities to the community (e.g. home visitors) and referral hospitals, clinics and institutions (e.g. the police) outside the camp.

Evaluate the use of data.

The assessment of HIS should include how data is used. The purpose of HIS is to make decisions about priorities (whether or not to intervene, what interventions are needed, etc.) and make decisions about whether or not changes are needed in how interventions are carried out. Look for evidence that data from HIS is being used to make these decisions, correctly and at an appropriate frequency.

Continue to refine the HIS as indicated.

This is a continuous process that should begin in the emergency phase. To help identify emerging health problems and vulnerable groups better, the following data about each death is recommended:
- Name;
- Location of residence;
- Date of death;
- Date of birth (or age of death if unknown);
- Sex;
- Origin (displaced vs. local);
- Cause; and
- Location of death.[28]

Include more detailed information in the morbidity surveillance system such as age by month for under-fives, location of residence, sex and origin.

Include information in the system about chronic or less fatal diseases such as sexually transmitted infections, TB, diabetes, and hypertension and injuries.[32] Consider dropping from the information system that information that is not worth the effort of collecting. Based on assessments of the HIS described above, changes will also be continuously needed to improve the quality and use of existing data.

Task 2: Increase use of surveys and qualitative data collection methods

Increase use of surveys.

Surveys provide information that is difficult to collect at health facilities. A survey can provide information about the home such as oral rehydration of simple diarrhoea or care-seeking for malaria. Surveys also provide information on a population level that can be used to cross-check facility-based information. A vaccination coverage survey can be used to cross-check vaccination rates provided by the routine Health Information Systems (HIS). Mortality survey can also be used to cross-check crude and under-five mortality rates provided by routine HIS. As noted in other sections, persons with experience are required to conduct quality surveys.

Increase the use of qualitative and participatory data collection methods.

In the emergency phase, defined by doubling the mortality rate, the priority is to reduce mortality. Once mortality rates have substantially declined to or near to the baseline, the 'return to normalcy' goal becomes increasingly important. This leads to the question 'what are the priorities in the post-emergency phase?' A more important question might be 'whose priorities?' Qualitative and participatory data collection methods are well-suited for helping humanitarian workers to listen to the beneficiary population about their needs and desires and priorities for a 'return to normalcy.' As with surveys however, experienced persons are required to implement these methods adequately.

Figure 2-37: Using participatory methods

Participatory methods are especially useful for helping beneficiary populations participate in defining priorities, deciding actions to meet priorities and determining which local capacities should take action. Humanitarian agencies should strive to give beneficiary populations the capacity to do things for themselves. This means defining with the beneficiary population what the role of humanitarian agencies will be in the 'return to normal.' Weiss et al. (2000) provide a practical, Internet-available guide to participatory learning and action to address perceived needs of refugees and internally displaced persons.[38]

Sphere indicators

Figure 2-38: Sphere indicators for Health Information Systems

- A standardised Health Information System (HIS) is implemented by all health agencies to routinely collect relevant data on demographics, mortality, morbidity and health services;

- A designated HIS coordinating agency or agencies is identified to organise and supervise the system;

- Health facilities and agencies submit surveillance data to the designated HIS coordinating agency on a regular basis. The frequency of these reports will vary according to the context, e.g. daily, weekly, monthly;

- A regular epidemiological report including analysis and interpretation of the data, is produced by the HIS coordinating agency and shared with all relevant agencies, decision-makers and the community. The frequency of the report will vary according to the context, e.g. daily, weekly, monthly;

- Agencies take adequate precautions for the protection of data to guarantee the rights and safety of individuals and/or populations;

- HIS includes an early warning component to ensure timely detection of and response to infectious disease outbreaks; and

- Supplementary data from other relevant sources are consistently used to interpret surveillance data and to guide decision-making.

Appendix 2-1: Sample RHA from International Rescue Committee (IRC)

Rapid health assessment for Pakistan earthquake

Date of visit:____|____|_____   Compiled by: Organisation:
     (dd   mm yyyy)   _____ _____

Name of location: District:
                           Urban / Rural (circle one)
_____   _____

District and subdistrict: Name of town or city: GIS coordinates:

_____   _____ _____

Access and security

Main routes to location: _____
Distance from hard surface road? _____ kms. Routes passable with lorry: [ ] Yes [ ] No
Are there security problems? [ ] Yes   [ ] No If yes, specify: _____

Telephones working? [ ] Yes   [ ] No

Population

Total population (approximate or estimate): _____   Number of displaced people: ____
Estimated sex ratio of current adult population: _____% women
Number of children < 5 years (or %): _____   Number of pregnant women: _____
Number of orphans or unaccompanied minors:_____
Number of unaccompanied elderly:_____
Are there other especially vulnerable population groups in the area (for example, isolated villages):_____

Main causes of morbidity

What are the 3 – 5 main causes of morbidity?
As reported by the population: _____
As documented at health facility (%):_____
Estimated number of injuries:_____
Estimated number of people requiring transfer to hospital:_____
Has there been a suspected infectious disease outbreak in recent days/weeks?
If Yes, describe symptoms/suspected disease, place, number of people affected:

Death rates in recent time period

Estimated population before earthquake:_____
Estimated no. deaths within 24 hours of earthquake:_____
Estimated number of missing: _____
Estimated number of deaths in the past 7 days: < 5 years: _____   > = 5 years:_____
Major causes of death over past 7 days:

-   > = 5 years:

-   < 5 years:

Overall mortality rate (all ages): _____ deaths per _____ persons per _____
(recent time period)
Mortality rate in children < 5: _____ deaths per _____ children < 5 years per _____
(recent time period)
Health facilities (district hospital; tehsil hospital; civil hospital; RHC; BHU; civil dispensary)
Type of health facility: _____ Damage level _____Functional: Y / N

Type of health facility: _____ Damage level _____Functional: Y / N
Is there an ambulance service: [ ] Yes [ ] No
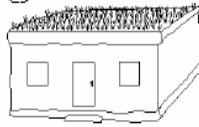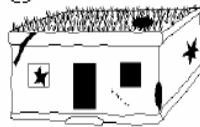
Maternal and child health and nutrition

Is there access to an Emergency Obstetric Care centre in the area assessed? [ ] Yes [ ] No
Number of LHWs _____ % of children 9 – 59 months vaccinated for measles: _____ %
Number of children screened for MUAC (Specify: convenience sample/SSR/total
population): _____
Number of children with MUAC indicating: Normal _____ At risk:_____
Mod:_____ Severe:_____

Shelter - Provide estimated % of population in following shelter:

None/Exposed:_____ Tents:_____ Makeshift materials:_____ Normal structures:_____
Percentage of homes non-habitable: _____

Water - Provide % of population using the following as main water source:

Piped system_____ Spring _____ Well _____ River or Stream _____ Bottled water_____
Distance of main water source from homes: _____

Sanitation - Provide % of population with access to:

None _____ Latrine _____ Inside toilet_____

Distributions - Specify what distributions have occurred

Tents	Y / N	Water Container	Y / N	Food	Y / N
Blankets	Y / N	Bottled water	Y / N	Soap	Y / N
Other shelter	Y / N	Cooking utensils	Y / N	Hygiene kits	Y / N

Access to fuel and electricity

Electricity   Y / N   Wood   Y / N   Gas   Y / N   Kerosene   Y / N

Main needs - Prioritise needs from 1 - 7

Shelter _____ Blankets _____ Food _____ Water _____ Sanitation _____
Health care _____ NFIs _____

Issues related to above

2

Health systems and infrastructure

Appendix 2-2: Declaration of Alma-Ata

Declaration of Alma-Ata, description of Primary Health Care[27]

Primary Health Care:

1. Reflects and evolves from the economic conditions and socio-cultural and political characteristics of the country and its communities and is based on the application of the relevant results of social, biomedical and health services research and public health experience;

2. Addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly;

3. Includes minimum education concerning prevailing health problems and the methods of preventing and controlling them; the promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries and provision of essential drugs;

4. Involves, in addition to the health sector, all related sectors and aspects of national and community development particularly agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; it demands the coordinated efforts of all those sectors;

5. Requires and promotes maximum community and individual self-reliance and participation in the planning, organisation, operation and control of primary health care, making the fullest use of local, national and other available resources; to this end, it develops through appropriate education the ability of communities to participate;

6. Should be sustained by integrated, functional and mutually supportive referral systems, leading to the progressive improvement of comprehensive health care for all, and giving priority to those most in need;

7. 7. Relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries and community workers as applicable, as well as traditional practitioners. These individuals must be suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community.

Medical centre in Tréguine camp (Chad)
Rosemarie North / International Federation of Red Cross and Red Crescent Societies

Emergency health services

Description

This chapter provides guidance on key principles of emergency health services during emergency relief operations. This chapter complements the previous on health systems and infrastructure.

Learning objectives

- To characterise the consequences of disasters on health services and the role of health services in disasters;
- To describe different strategies for setting up health services in emergency situations;
- To discuss the key steps for managing a mass casualty incident;
- To characterise the crucial role of community health workers and community health volunteers and traditional healers in emergencies;
- To design a health centre with a logical patient flow;
- To discuss the implementation of emergency health services in the acute emergency phase;
- To discuss the particular health issues of maternal and child health, trauma and surgical emergencies and acute exacerbation of chronic diseases in emergencies;
- To discuss the key issues in managing essential drug supplies and the importance of standard protocols; and
- To define indicators that may be used to monitor and evaluate health services in emergencies.

Key competencies

- To understand the consequences of disasters and the role of health services in disasters;
- To recognise the staffing required for managing large numbers of casualties;
- To design appropriate facility-based and community-based health services;
- To understand the importance of supporting community health services;
- To understand how to implement emergency health services in the acute phase;
- To recognise and address special health issues in emergencies;
- To design a drug supply system; and
- To organise an information system for monitoring and evaluating health services.

Introduction

In the wake of a disaster, the interaction between vulnerabilities and disaster hazards may result in significant injuries and the loss of human lives. Since a large number of casualties can easily overwhelm the existing but partly destroyed medical facilities, establishing an emergency health services is critical. The type of health services provided depends on whether the emergency situation is a natural disaster, a complex emergency or protracted refugee health; but it must guarantee basic physical and mental care as well as prevention. In all emergency situations, the prioritisation of health services must focus on meeting both the short-term and long-term needs of the victims.

This chapter's audience is the local health relief worker, who might not have any formal medical training. This chapter will give guidance in providing emergency health care for different kinds of emergencies:

- Mass event with major long-term implications such as an earthquake or tsunami that results in major damage to the health system. In such a scenario, the local health system needs both immediate and long-term external assistance until the facilities can return to normalcy;

- Mass event of immediate but limited implications such as a train crash;

- Intermediate events such as displacement from flooding, lasting two to six week; and

- Mass displacement such as refugees fleeing from a neighbouring country, or internally displaced persons as in Northern Uganda with potentially longer term-needs in a select population.

Local organisations must foster a spirit of collaboration in the response to a disaster. The consequences from a lack of coordination among NGOs include the development of many parallel health systems. These duplicate services in one area while leaving others uncovered. It is the responsibility of the ministry of health and the lead health agency to coordinate all the activities of the involved agencies. It is also the responsibility of each agency involved in the emergency to recognise that the primary purpose of coordination is to achieve maximum impact with the given resources and to work with one another to reach this endpoint. A parallel health system, however, might need to be set up where local health facilities are not functioning nor have a limited capacity. In these situations, coordination of services is paramount.

The best way of setting up an emergency health programme is to strengthen the local system through local organisations. The emergency health programme must match the government's health policies such as essential drugs, treatment protocols and referral systems. The priorities for health services in the emergency phase should focus on treating common health conditions such as trauma injuries, acute infections and acute exacerbation of chronic diseases. It should also involve all available health providers including community health workers. An ongoing health information system for monitoring the health status of the affected population can be integrated into the existing national health information system. In the post-emergency phase, health services can be expanded to include treatment of chronic diseases, comprehensive reproductive health and mental health care.

Effects of disasters

The effects of disasters on health depend on the disaster's type and time of onset. Sudden onset disasters such as earthquakes pose greater threats to health than slow onset disasters. The actual and potential health problems resulting from the disaster are multi-faceted and do not all occur at the same time. The resulting health problems might be related to food and nutrition, water and sanitation, mental health, climatic exposure and shelter, communicable diseases, health infrastructure and population displacement.[17] The effects of disasters on health services will be discussed later. Other chapters in this book will discuss other health needs.

Consequences of disasters on health services

Disasters, whether natural or human-made, create particular problems for health services.

Damage to health infrastructure:

- Disasters can cause serious damage to health facilities, water supplies and sewage systems. The damage can severely limit health systems' provision of medical care to the population in the time of the greatest immediate need. Structural damage to facilities poses a risk for both health care workers and patients;

- The supply chain (medical equipment and pharmaceutical supplies) for the health facilities is often temporarily disrupted;
- Limited road access makes it at least difficult for disaster victims to reach health care centres. Relief organisations might also have difficulties reaching vulnerable populations; and
- Pre-hospital coordination and communication is crucial in emergency situations. Disrupted communication systems lead to a poor understanding of the various receiving facilities', military resources' and relief organisations' actual capacity. Consequently, the already limited resources are not effectively utilised to meet the demands.

Increased demands for medical attention:

- Climatic exposure because of rain or cold weather puts a particular strain on the health system;
- Inadequacy of food and nutrition exposes the population to malnutrition, particularly in the vulnerable groups such as children and the elderly; and
- If there is a mass casualty incident, health systems can be quickly overwhelmed and left unable to cope with the excessive demands.

Population displacement:

- A mass exodus from the emergency site places additional stress and demands on the host country, its population, facilities and health services, particularly.
- Depending on the size of the population migration, the host facilities may not be able to cope with the new burden, and
- Mass migration can introduce new diseases into the host community.

Major outbreaks of communicable diseases:

- While natural disasters do not always lead to massive infectious disease outbreaks, they do increase the risk of disease transmission. The disruption of sanitation services and the failure to restore public health programmes combined with the population density and displacement, all culminate in an increased risk for disease outbreaks.
- The incidence of endemic vector-borne diseases may increase due to poor sanitation and the disruption of vector control activities.

The role of emergency health services in disasters

Disasters, depending on their type and magnitude, result in various levels of morbidity and mortality. Except earthquakes that produce special demands, the number of disaster victims requiring medical care is usually low. The demand for curative care is highest during the acute emergency stage, when the affected population is most vulnerable to the new environment and before basic public health measures such as water, sanitation and shelter have been implemented. Afterwards, the priority should shift to preventive measures that can improve the overall health of the displaced population dramatically.

Disasters call for a coordinated response between curative and preventive health services, including food supply, water and sanitation. To minimise mortality and morbidity, it is also necessary to organise the relief response according to three levels of preventive health measures:[21]

Primary prevention is the ultimate goal of preventive health care. It aims to prevent the *transmission* of disease to generally healthy populations by using the following actions:

- Promoting healthy practices;
- Implementing public health measures that reduce a population's exposure to risk factors such as ensuring a safe drinking water supply to prevent diarrhoea, an adequate food supply to minimise malnutrition and distributing mosquito nets to prevent malaria; and

- Conducting medical interventions such as chemo-prophylactics against malaria and measles immunisation.

Secondary prevention identifies and treats as early as possible diseased people to prevent the infection from progressing to a more serious complication or death. This is done using the following:

- Alleviating symptoms of diseases such as giving Oral Rehydration Solution early to a child with diarrhoea to prevent dehydration and possible death; and
- Curing patients with diseases through early detection and treatment of TB, dysentery, etc.

Tertiary prevention reduces permanent damage from disease such as a patient being offered rehabilitative services to lower the effects of paralysis due to polio or land mine injuries.

The role of the military in disaster response

The military are often one of the earliest first responders to a disaster. Its principle role is to assist in supporting the civilian authorities. The military's hierarchical command structure allows it to respond to disasters in a rapid and coordinated manner. Military services generally have easy access to resources and are equipped to perform vital functions in disaster response such as resource distribution, security services, search and rescue, logistics assistance, transportation to otherwise unreachable communities and field hospital staffing and management.

Traditionally, most NGOs (local and international) do not involve the military because of the need for neutrality, impartiality and independence. While the nature of humanitarian response is becoming both more complex and insecure, the concerns about neutrality become more blurred. The overlap of humanitarian missions between the NGOs and the military is now more common. This issue, however, is beyond the scope of this chapter. If the political climate allows for collaboration, the host country's ministry of health and the lead health agency should consider coordinating with the military in the response to a disaster as well as in the disaster preparedness plan.

Disaster preparedness

Disasters becoming more frequent since the turn of the 21st century, preparedness for disasters takes a more prominent role in the prevention of a disaster's adverse outcomes. The health objectives of disaster preparedness are to: [1] [2]

- Prevent morbidity and mortality;
- Provide care for casualties;
- Manage adverse climatic and environmental conditions;
- Ensure restoration of normal health;
- Re-establish health services;
- Protect staff; and
- Protect public health and medical assets.

Disaster preparedness requires a comprehensive approach and must involve all sectors. The government, private and community organisation are all stakeholders in the preparedness process. According to Keim and Giannone, the preparedness process includes policy development, vulnerability assessments, disaster planning, training and education, monitoring and evaluation. [1]

Policy development

National governments must designate a branch of the ministry or organisation with the responsibility to develop, organise and manage an emergency preparedness programme for the country. This group must work with central government, provincial and community organisations and NGOs whether local or international to develop a set of policies agreed upon by all. This process is vital for a well coordinated response and a sustainable policy. The policies' endpoint must allow quick decision making, ensure the actions are legal and free from liability and ensure that appropriate pre-defined actions are taken during a state of emergency.

Vulnerability assessment

Potential hazards for the community are identified and prioritised in a vulnerability assessment. The community's capacity can be determined by the availability of resources of the community and how the community is able utilise these resources. The community's capacity is balanced against the degree of exposure to certain hazards that a community is susceptible to. This balance or its lack between capacity and susceptibility to hazards can determine a community's vulnerability to disasters. Once the vulnerabilities are identified, the assessment must also recommend how to address each of the vulnerabilities.

Disaster planning

Planning is only one component of preparedness. A disaster's outputs plan must provide:

- An understanding of organisational responsibilities in response and recovery;
- Stronger emergency management networks;
- Improve community awareness and participation;
- Effective response and recovery strategies; and
- A simple and flexible written plan.

Training and education

An important component of preparedness is to train and educate public health officials and community responders about the disaster plan. Training must provide the important skills and knowledge needed to show an effected community how it can participate in emergency management and also show it the appropriate and critical actions needed in an emergency.

Monitoring and evaluation

The objective in monitoring and evaluation is to measure how well the disaster preparedness programme has been developed and is being implemented. A systematic analysis must study the components of the preparedness programme and determine if it achieves its health objectives as discussed above.

A cartoon with a serious message. This animated show is a fun way for children to learn about safety against the threat of future disasters not only to ensure that they are safer, but also to teach children to become disaster guides for their families.
Photo: Amalia Soemantri/ International Federation

3

Planning emergency health services

Figure 3-1: The planning cycle
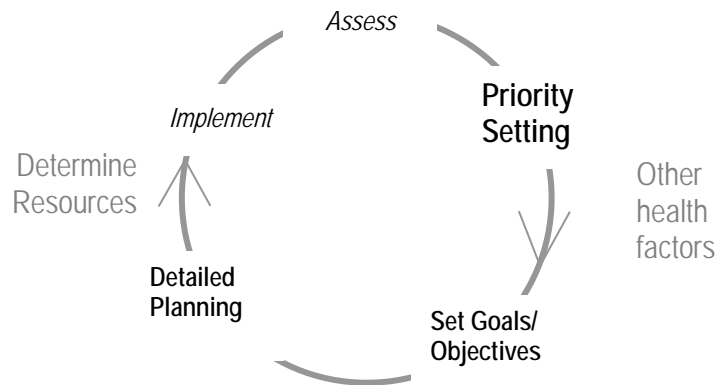
Assessment and priority setting

With limited resources, emergency health services planning must be based on the best available information. As will be discussed further in the epidemiology chapter of this book, needs assessment can gather information that is critical for prioritising health care needs.

In small size local disasters that involve mass casualty incidents, a rapid assessment of the scene must be part of the initial steps for any mass casualty management. This will be discussed later in the chapter. The mass casualty incident may be the result of a bus accident or a small natural disaster. The rapid assessment covered in the epidemiology chapter will provide management with a broad picture of the emergency's issues rather than just the health issues.

Emergency health care must focus on the most urgent health problems. These may vary depending on the nature and magnitude of the disaster on and whether there is a long-term population displacement. Any interventions recommended after the assessment must prevent excess mortality and morbidity as well as anticipate future health problems from the evolving emergency situation.

A simple technique shown in Figure 3-2 can rank problems and identify priority health interventions within the selected health services.

Figure 3-2: Ranking health problems [18]

		Frequency of disease diagnosis	
		High	**Low**
Risk of excess mortality or morbidity	*High*	Malaria Diarrhoea	TB Epilepsy
	Low	Intestinal worms URTI	Ringworm Arthritis

It would be impossible and ineffective to address all issues all at the same time. Health interventions prioritisation is vital to the success of the disaster response campaign. Some diseases occur very frequently and are associated with a high risk of death such as malaria and diarrhoea in children under five years. These must be addressed before other diseases

that have as high a frequency but a lower risk of serious illness or death such as intestinal worms. Cases that are not emergent may be addressed after the life-threatening diseases have been put under control.

Other health considerations

After setting the priorities of an emergency health programme, consider the consequences of other health problems that were not addressed, for example:

- A higher number of tuberculosis (TB) cases among displaced populations might increase the risk of infection within the host countries' populations;
- A large population of adolescents in a displaced population with a high prevalence of sexually transmitted diseases might increase the spread of HIV/AIDS;
- Neglecting the local population in disease control activities might render the control measures among the displaced population ineffective; and
- Ignoring harmful traditional practices might cause permanent injury to the victim.

Setting goals and objectives

The **goals** of establishing emergency health care for large displaced populations can be defined as:

- Reducing excess mortality and morbidity; and
- Targeting the health problems that are causing the excess mortality.

The goals for reducing excess mortality and morbidity can be reached by providing the appropriate medical care to those with:

- Acute injuries resulting from trauma or acute exacerbation of chronic medical diseases in a disaster's aftermath; and
- Clinical illnesses from communicable diseases.

To target the health problems that cause excess mortality use the following preventive approaches:

- **Implementing preventive health measures** that combine primary, secondary and tertiary prevention. These are effective for reducing excess mortality;
- **Targeting vulnerable groups** for preventive health services such as children under five, pregnant women, the elderly and unaccompanied minors; and
- **Monitoring** population and health services data to detect emerging health problems.

For further details on preventive health measures, refer to the control of communicable diseases chapter.

Both immediate and long-term **objectives** can target groups with an increased risk of death and illness such as children under five, pregnant women, the elderly and unaccompanied minors. Targets for each objective can later be used to evaluate the programme in achieving stated objectives; for example:

- If 85% of the patients with TB completed treatment within the stated time period.
- If the death rate of children under five is declining or has returned to pre-disaster levels.

Detailed planning

A plan of action that defines how to reach programme goals and objectives must be developed. The following steps can be used to develop a plan:

- Identify the priority health services needed and when they should be established;
- Define the level of health care that will be provided;
- Define the strategy for providing health services; and
- Set standards for health services.

Identify the priority health services needed

The type of emergency health care established will depend on the emergency situation. Plan the programme in phases that are based on the priority health needs. For further details on prioritising health services, refer to the health systems and infrastructure chapter.

Define the level of health care that will be provided

As most developing countries have a health care system that is based on the primary health care (PHC) model, emergency health care should be implemented at the most appropriate level of the primary health care system available. The primary health care system should include the following levels of care:

- Home or family level;
- Community level, including Community Health Workers and other home visitors
- Peripheral health facilities (dispensary or health post);
- First level health facilities (health centre); and
- Referral hospital.

Note: not every emergency will require all levels of care.

With limited resources, only those levels that will effectively prevent excess illness and deaths should be introduced. The community and first level of health care, which are most cost-effective, should be introduced at the very beginning of the emergency. Additional levels of health care may later be introduced according to their potential for preventing excess illness and deaths. Refer to the health systems and infrastructure chapter for a detailed discussion on clinical services in the emergency and post-emergency phases.

Defining the strategy for establishing health services

There are two basic strategies for providing emergency health care to a large displaced population:

- Facility-based health care; and
- Community-based health care.

Each strategy is described below.

Facility-based health care

Facility-based health care can be established by augmenting the local health care system, setting up a separate health care system or setting up mobile or satellite clinics.

Augmenting the local health care system—the preferred approach

Avoid as much as possible building a 'special emergency hospital'. Some local health systems will have the capacity to absorb the additional demand from displaced populations, especially in situations where:

- The total displaced population does not overwhelm the local services;
- There is little political tension between the local population and the newcomers;
- There is no excess demand for health services from disease outbreak or mass casualty incidents.

Even though the host country is primarily responsible for the care of displaced populations, relief agencies should try to strengthen the capacity of the local health care system. Existing health facilities should be assessed and repaired. Donated tents can be used to increase the size of the facility. The overall quality of local health services can be

improved through the regular supply of essential drugs and staff training. Augmenting local services has many advantages because:

- Resources are not wasted by duplicating existing services;
- Local health authorities are directly involved with the problems faced by the displaced population; and
- Both the host and displaced populations receive equal medical attention, thereby reducing resentment from the host population.

When augmenting local services, certain issues must be agreed upon:

- Compensate local services for extending health care to the displaced population such as paying the user fees for displaced people where cost-recovery programmes exist;
- During the Indian Ocean Tsunami, UNHCR coordinated with all the NGOs working in Indonesia to pay IDP workers a standard rate equal to that received by the locals. In Kenya, outpatient consultations for refugees were free, but UNHCR was charged double rates for inpatient care and diagnostic procedures;
- Provide means for communication and patient transfer between different levels of health care sites to improve their access and the access of referral services.
- Re-distribute health personnel so that the workload is evenly spread out. Additional staff, such as a surgeon or other health workers from less affected areas can be 'seconded' to the emergency health programme or various in-service training courses can be organised;
- Provide incentives for existing health workers handling an increased workload;
- Identify measures that can promote the return of health demands to normal or pre-disaster levels; and
- Agree on changes to national health policies such as TB treatment and measles vaccination programmes for large displaced populations. This might be different from those in place for host populations.

Setting up a separate health care system

Sometimes local services are inaccessible, overloaded or short-staffed. If setting up new facilities is the only option, seek approval from the national health authorities at the beginning. Where possible, policies of the host country health system should be adopted for the following:

- Clinical diagnosis and therapeutic protocols;
- Essential drugs and drug supply;
- Patient flow and referral system;
- Health information system;
- Training curriculum for health workers including health workers from the displaced population;
- Minimum staffing levels per facility including expatriates; and
- Coordinating health care and relations with the national health care system.

Good coordination with the national health authorities is critical because the introduction of a separate health care system can create problems for the host government:

- There might be marked differences between the levels of health services for displaced populations and locals. This is more likely to occur if the local health care is sub-standard;
- The host government must ensure that health services for the displaced population which are free and of better quality does not create competition between local and private health services which are based on cost-recovery;
- Most of the health workers should be recruited from the displaced population to overcome any cultural and language barriers. Their foreign medical documents, however, might not be recognised by the host government; and

▪ Higher salaries from externally funded relief programmes can drain local staff from local facilities.

Although relief agencies should focus their efforts on the health of the displaced population, in some cases it is as important to assist the local population. Since both the displaced and local populations are at risk during a disease outbreak, relief agencies should support local health authorities to implement effective disease control measures. Where local health facilities are lacking or cannot be strengthened, host populations must have access to health care services set up for displaced populations.

Field hospitals and clinics

The Pan American Health Organisation cites three basic criteria for setting up a field hospital:

▪ Be fully operational within twenty-four hours of the disaster;
▪ Be able to provide services that coincide with medical needs; and
▪ Allow for national health personnel to operate the technology contained within.[17]

More specifically, a field hospital should have the following features:

▪ A secure location;
▪ Easy access for the population to be served;
▪ Several access routes for transport of patients and supplies;
▪ Adequate water supply: 150-200 litres per patient per day including laundry;
▪ Access to local staff and translators;
▪ An organised supply chain;
▪ Sanitation system with latrines, drainage and waste disposal;
▪ Covered waiting areas for protection from the weather; and
▪ Several generators for a reliable electricity supply.

Example: ready-made systems and kits

Organisations like the International Federation of Red Cross and Red Crescent Societies have created preparedness and 'press the button' response systems with equipment ready for immediate use. Ready-made systems are quick, but they can only provide an operational platform that will have to have some adjustment once it is in the field.

Between disasters, the International Federation pays a lot of attention to training volunteers in the community to do preparatory work, looking after basic health needs and reporting on local conditions. During a disaster, the International Federation uses Regional Disaster Response Teams (RDRT) and Field Assessment and Coordination Teams (FACT) to assess the magnitude of needs, identify priorities and channel assistance to high priority areas in order to reach the neediest. Tented Emergency Response Units (ERU) are provided if needed at the secondary level to cover peripheral, clinical and community level needs.

At the same time, ERU hospitals are set up to cover needs at the tertiary level. To reach very remote areas, mobile systems are developed on a temporary basis. Essentially, the Interagency Emergency Health Kits (IEHK replacing the NEHK) are used as a medical supply base.

To support the emergency health system, other ERUs in water and sanitation, relief, logistics including medical logistics and IT are called upon. During the Tsunami operations, 17 ERUs, three FACTs and a large number of RDRT members were used.[21]

Since an ERU hospital is very complex, a ready made organisational chart and generic job descriptions help facilitate the start-up phase. All boxes are numbered in a specific way so that workers can easily identify all the items needed first. Colour coding further helps the supplies to reach the right division as soon as possible. This is illustrated below with the various tent colours.

Figure 3-3: Diagram of a ready-made system
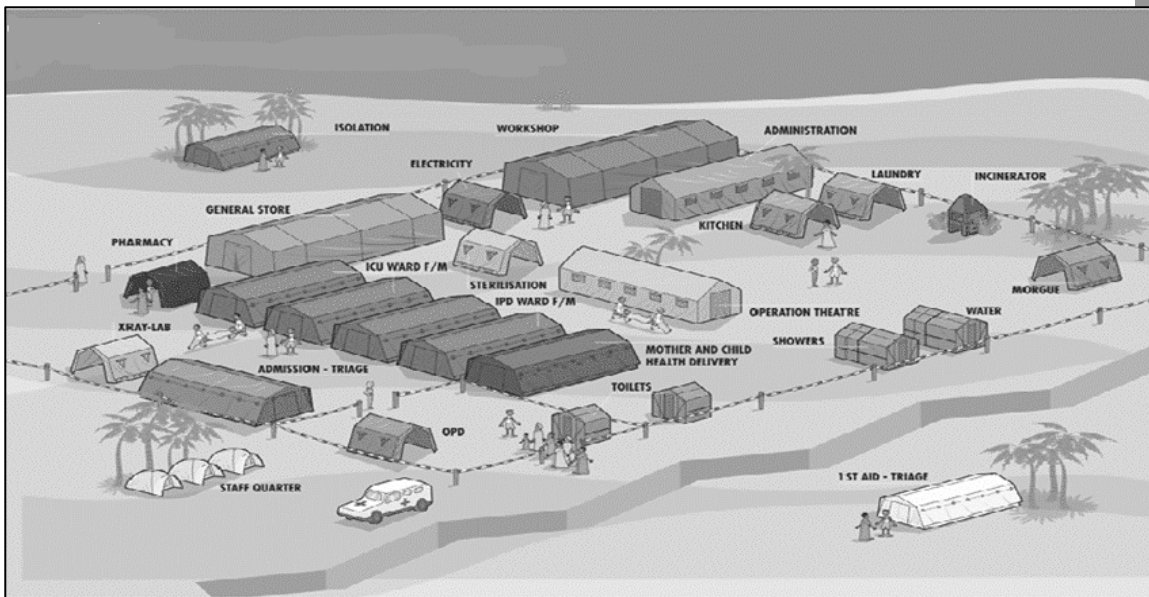
Often, ready-made systems are not available. They have to be created one or parts of them on the ground. The initial step is to set up a health centre for 10,000 to 30,000 beneficiaries supported by a network of home visitors and a referral system to a tertiary care hospital. This enables active case finding and the integration of beneficiaries into the health system.[18] Maintain a triage system throughout this process so that serious yet easily treatable diseases are immediately taken care of such as diarrhoea that might lead to severe dehydration. More complex problems are referred to specialised centres where chronic but non-life threatening problems are quickly treated such as small contusions or arthritis.[18]

Example: setting up a health centre in Pakistan

When setting up a health centre, be sensitive to gender in the local context. After the Pakistan earthquake on October 2005, several rural health centres which are equivalent to the secondary level of care in normal circumstances were totally destroyed. Relief workers, therefore, had to set up tents as temporary facilities until the centres could be rebuilt. Since the tents were located near the original health centres, all the local people knew where to go for health services. The large tent had barriers that could be erected for privacy between rooms as well as an entrance at both ends. A separate tent and latrine were set up at a distance from the main tent to give women some privacy. The benefit from using tents is that the facility is modular and can be adapted to changing needs such as separation of services by gender.

One suggested layout for an independent health centre with a lab and basic maternity care is given below in Figure 3-4. Although most cases will be diagnosed clinically, there might be a need for laboratory services in certain situations such as countries where drug resistant malaria is a major problem.[13] Until the rehabilitation phase is initiated however, laboratory services should be kept to a minimum. Laboratory services that are implemented should be agreed upon and established with the host country government.[20]

Figure 3-4: Suggested layout of a clinic

Lab	Treatment room	Office	Duty utility	WC/ bath	Maternity
←			→		
Pharmacy/store	Multi-purpose room	↑	Adult OPD	Inpatient ward	Inpatient ward
Dispensary	Registration		Mother and child clinic		
ENTRANCE					
Covered waiting area			Covered waiting area		

Setting up mobile or satellite clinics

Outreach services are appropriate for delivering preventive care such as immunisations or antenatal care. Outreach clinic supervisors should be encouraged to visit health workers based in the community such as Community Health Workers, Traditional Birth Attendants (TBAs) and auxiliaries to assess and build the capacity of the community-based health workers. Mere contact with medical care at regular intervals, however, does not ensure that the community does have *access* to health care. Access implies a *continuous relationship* between those who need services and the health care provider. Outreach clinics are not the appropriate facility for treating serious medical conditions that require a more frequent follow-up.

Photo: International Federation

Facility-based health care—key points

The aim of establishing an emergency health system should be to strengthen the local health system. Whichever strategy is adopted, all services should function effectively and be well coordinated to achieve the following:

- Comprehensive care—looking for other conditions that a patient may not report such as depression with persistent headaches or abdominal pain (somatisation);
- Continuity of care—following up referrals, defaulters of TB treatment or immunisation; and
- Integrated care—linking curative with preventive care at every opportunity such as combining child immunisation with antenatal clinic days.

Refer to the health systems and infrastructure chapter for further details.

Community-based health care

Strengthening local health facilities does not guarantee that everyone will use them. Many patients, some seriously ill, might still not pursue medical treatment, even if the facilities provided are nearby or free. Possible barriers to seeking health care include the lack of:

- Awareness of available services;
- Access due to various problems such as being too far, inconvenient hours of operation, health workers' poor attitudes, no money for drugs, ethnic-based or politically-based discrimination and inadequate security; and
- Health care resources such as drugs, materials, staff and services.

If such barriers to facility-based health care exist, community-based health care is very important.

Setting up a community health worker programme

There are two ways of establishing community-based health care:

- Setting up a community health worker programmes; and
- Integrating alternate health providers.

Community health workers who have received training as emergency first responders are a great resource in the acute phase of the disaster response. Local health workers are usually the first to respond to any local disaster before any external help even arrives. Their knowledge of the local geography, people and health system is invaluable.

In a disaster's recovery and post-emergency phases, Community Health Workers (CHWs) are community members who are trained to act as direct intermediaries between the beneficiary population and the health care system. The reasons for setting up a network of CHWs are to extend emergency health care coverage through mobilising the community for public health initiatives and through preventive health activities such as disease control and surveillance. CHWs reduce health facilities' patient burden by increasing the population's awareness of how to improve their own health and take preventive health measures such as proper water and sanitation practices. This allows staff at health facilities to concentrate on more severe conditions.

The appropriate level of training for Community Health Workers (CHW) depends on both the available resources including CHW trainers and supervisors and the CHWs' expected role in providing Primary Health Care (PHC). During the acute emergency phase, initial training should focus on simple priority tasks that address immediate health needs such as:

- Identifying cases of disease as early as possible;
- Referring the seriously ill as early as possible;
- Identifying vulnerable groups;
- Information, Education and Communication about disease prevention and control such as water and sanitation, re-hydration, good nutrition, immunisation, safe motherhood care, condom distribution and protection from sexual violence; and
- Data collection on all the above activities.

The following points should be considered when setting up a CHW programme:

- Ensure that CHWs are selected from all ethnic groups and that at least half are female.
- Realise that some CHWs may be illiterate. Training and updating the CHWs on current health protocols must be delivered at their level of comprehension, that is demonstrations through enactment or pictures, verbal communication etc. CHWs will need support in keeping records of their activities; and
- Define CHW roles clearly. PHC programmes will, therefore, work better especially when CHWs receive visible support from both the community and the entire health care team.

Integrating alternate health providers

Some displaced population members might prefer to use the services of alternate health providers. Health workers in the facilities must try to understand the population's reasons for seeking alternate health care and integrate these alternate health providers into the emergency health system.

'Modern' health practitioners:

Within the displaced population, there may be doctors and nurses who have been formally trained in their country of origin but lack certification to work in the local health sector. It might not, therefore, be possible to incorporate them directly into the emergency health programme. The emergency health system, therefore, should encourage these people's involvement to streamline patient management practices especially drug treatments and improve the reporting of communicable diseases. They should be encouraged to use the referral system (at both upper and lower levels.

Non-government organisation (NGO) hospitals:

These hospitals might have been set up by religious institutions long before the emergency. They often provide quality health care for a small fee. The critical role these hospitals play at the onset of a disaster might be overlooked after the emergency health system is set up. Close links must be maintained for mutual support within the health care system.

Other service providers:

The community's overall health needs can be better represented within the emergency health system by integrating into the system community

- Elders,
- Religious leaders,
- Teachers, and
- Social service organisations.

These community members should have access to basic medical training such as first aid. Integrating modern and traditional medicine increases the effectiveness of emergency health services. Training workshops, regular meetings and supervision visits should be established for the alternate health providers if possible. This will improve patient care and referral. It will also discourage harmful practices. Traditional healers can also participate in preventive health measures such as immunisations and HIV/AIDS prevention.

Setting standards for emergency health care

Because emergency health programmes involve health workers and organisations with different training backgrounds, delivery of services must be standardises. Relief agencies must make it known from the beginning the standards or protocols must be followed (ministry of health, WHO, etc.). These standards can be used later to evaluate the programme. Advantages from standardising emergency health care include:

- Easier integration of new staff members;
- Regulating patient referrals to higher levels of care;
- Improving management of drugs and equipment; and
- Preventing competition between facilities that provide the same care.

Standardising the care-giving process

Care-giving procedures may vary for health providers at various levels of care. Highly-trained health workers in hospitals can apply a wide range of diagnostic and care-giving procedures, but Community Health Workers being based in the community should only use those procedures which reflect their level of training and competence.

Health care providers should be trained to approach each patient's health problem in a systematic way. After receiving a patient, a clinical history should be taken, a physical assessment done and an interim diagnosis made. A decision can, therefore, be made of whether to treat the patient with medical drugs or procedures, give advice on home care, make a referral or give a follow-up. If after deciding to do nothing, the health care provider must explain to the patient why this decision has been made otherwise patients might lose confidence in the health system and become less keen to follow advice about preventive measures.

For effective health care, patients should accept the decision of the health care providers and follow their instructions such as taking medications strictly as advised. Whether or not a patient is willing to 'follow doctor's orders' can be influenced by the following:

▪ Cultural beliefs about the cause and outcome of the illness;

▪ How much advice a patient receives about the illness and the treatment needed;

▪ Use of standard health cards such as patient medical records which document the patients' clinical history, diagnosis, decisions and future appointments;

▪ The type of treatment prescribed such as drugs and injections; and

▪ Possible follow-up visit from a community health worker.

Using standard health cards

Health workers must document each patient's diagnosis and specific treatment using the standard method. Health cards or exercise books for each patient can be introduced and kept either at the registration office or by each family. These will help in the follow-up of patients as well as in monitoring the quality of health care.

Standard case management

To prevent unnecessary treatment, investigations and the wastage of limited resources, drugs and staff, standard case management procedures must be established. These include standard:

▪ Diagnostic protocols and case definitions;

▪ Procedures for diagnostic common illnesses. Many of them represent simple flow charts using standard case definitions to identify key signs from the patient's history and physical assessment and, where necessary, laboratory investigations[15]

▪ Investigation procedure. A laboratory might be set up before or during the post-emergency phase at the health centre. Standard laboratory procedures such as specimen collection, storage and analysis should be used to confirm a diagnosis and define the drug sensitivity patterns of disease pathogens during major outbreaks of malaria or cholera;

▪ Treatment protocols. Most countries have established national treatment protocols for common ailments based on the essential drugs supply. **Note** that for some diseases such as TB, the treatment of displaced people might have to be different from that of the host population;

▪ Admission criteria. Standardising admission procedures prevents the admission of non-serious cases that could overload inpatient facilities. Standard clinical procedures and guidelines for managing serious health problems ensure that critically ill patients are promptly admitted and given the appropriate care including close monitoring; and

▪ Referral criteria. Standardising the criteria for patient referral helps define the limits of each level of care and the health conditions that require higher level of attention and skills. This prevents emergency cases from being delayed at lower levels of the health system and non-emergency cases from being forwarded to higher levels. Standard procedures should be in place for referring inpatients to health care units after treatment of an emergency condition such as severely malnourished patient who are referred to therapeutic feeding centres after treatment for pneumonia.

Refer to the health systems and infrastructure chapter for more details about standard case management.

Mass casualty management

A **Mass Casualty Incident (MCI)** is any event where the needs of a large number of victims disrupt the normal capabilities of the local health service. MCIs range from a few patients injured in a bus accident that might overwhelm the capacity of one local hospital, to a natural disaster or conflict where hundreds or thousands of victims incapacitate the entire health system of the affected area.

Resources, transportation, access and physical environments are often disrupted during a disaster. These austere conditions place huge constraints on the very emergency medical care that should be given immediately to the affected population. An MCI's efficient management requires the pre-establishment of basic guidelines and principles of an Incident Command System (ICS), triage and patient flows according to the hospital's plan.
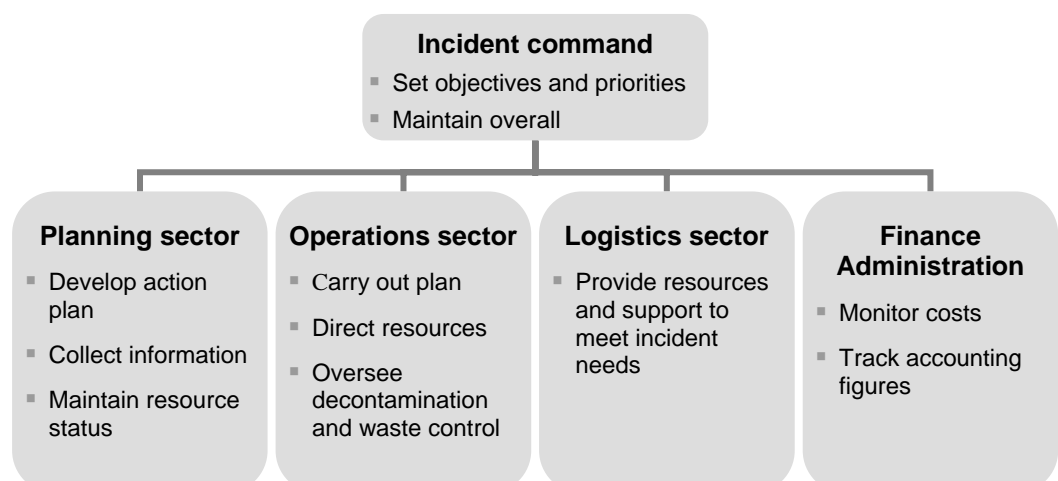
The incident command system

Incident command system is a hierarchical structure that commands, controls and coordinates an effective emergency response among all the agencies and organisations in a disaster. It is designed to organise people and resources and to allocate necessary services to the population in need.[6] Incident command system was developed in the United States in 1970 after previous problems with MCI responses. Previous problems included inadequate planning, poor communications, lack of an on-the-scene needs assessment and inappropriate triage of patients.

Incident command system is composed of five major components:

- Incident command;
- Operations;
- Planning;
- Logistics; and
- Finance

Incident command system is flexible in scaling-up or scaling-down the level of response to meet needs that arise in different circumstances without any loss of compatibility with the other entities involved. In a small incident, the incident commander can manage with the above five components. In large scale incidents, a chief for each sector will be necessary to report to the incident commander.

Figure 3-5. Incident command system organisational structure[6]

Incident command
- Set objectives and priorities
- Maintain overall

Planning sector
- Develop action plan
- Collect information
- Maintain resource status

Operations sector
- Carry out plan
- Direct resources
- Oversee decontamination and waste control

Logistics sector
- Provide resources and support to meet incident needs

Finance Administration
- Monitor costs
- Track accounting figures

Hospitals can adapt a similar structure to incident command system such as the Hospital Emergency Incident Command System (HEICS). These structures are set within a hospital system. Such an incident command system within the hospital can provide management a scope of supervision for all in-hospital personnel within one hospital as well as other hospitals responding to the incident.[5]

The Incident Command System (ICS) and HEICS disaster management tools are not currently used worldwide and even less so in developing countries. The incident command system concept is being introduced in this chapter as a reference management tool in disaster response. When developing a disaster preparedness plan, the incident command system concept should be incorporated into the plan. This concept is active on the management tool scene. It requires a great deal of preparation, planning, practice and capacity building from the government. The incident command system structure cannot be used as a tool to manage a disaster from a distance, however. Major losses of lives and unnecessary illnesses have resulted from its being used from a distance. Familiarisation and adaptation of the command structure to a disaster situation by the ministry of health and the lead health agency can help organisations involved in the response to understand their roles within the command system in the overall response.

Preparing to manage a Mass Casualty Incident (MCI)[1]

Management of an MCI begins with preparing the mobilisation of resources and following the standard procedures in the field and at the hospital. Hospitals with a limited number of emergency workers may find it difficult to hold regular training sessions on MCI management. Countries with limited resources should focus on the following preparations for managing an MCI:

▪ Improving routine emergency services for sudden-impact, small-scale incidents such as car accidents or accidents in the home). To avoid confusion, the same procedures that are necessary to save lives during an MCI should be performed during routine emergency services;

▪ Coordinating activities that involve more than one emergency medical unit such as police, fire fighters, ambulances and hospitals, etc;

▪ Ensuring a quick transition from routine emergency services to mass casualty management; and

▪ Establishing standard procedures for managing incidents of all scales such as search and rescue, first aid, triage, transfer to hospitals and hospital care.

MCI procedures should be adapted to the local situation in terms of staff skills, transport, communication, supplies and equipment. Standardisation of routine emergency activities will make the teams more efficient and will improve the overall survival of MCI victims. Each emergency unit (police, fire, health) should be prepared to respond to an MCI. Standard kits for field triage should be maintained and drills should be conducted regularly to develop well coordinated teams of trained personnel.

Table 3-1: Minimum requirements for a standard triage kit [19]

List of basic needs	
General:	**Medical disaster kit:**
▪ Maps, stationery ▪ Means for communication and transportation ▪ Area lighting, flashlights ▪ Identification devices for area, staff and victims: flags, arm bands, triage tags ▪ Stretchers, boards, blankets ▪ Protective devises: gloves, masks, etc. ▪ IV fluids, drugs for shock, tourniquet ▪ Dressing/Splint kit: compresses, antiseptics, suture set, splints, gloves ▪ Blood pressure cuff, stethoscope ▪ Scissors, adhesive tape	▪ Airway: oxygen, nasopharyngeal tubes (child and adult), oral pharyngeal airway tubes, end tracheal tubes, cricothyrotomy set, ventilation bag, suction device, chest tube set, albuterol, prednisone, saline. ▪ Orthopaedic: sodium bicarbonate injection, cephalexin, ceftriaxone, clindamycin, ketamine, lidocaine 1%, bupivacaine 0.5%, femoral block needle, amputation kit, fasciotomy kit, cervical collar. ▪ Circulation maintenance: atropine, CaCl, epinephrine (1:1000), furosemide, IV catheters, saline 0.9%, nitroglycerin spray, nitroglycerin transdermal, propranolol. ▪ Miscellaneous: dextrose 50% injectable, diphenydramine, insulin (regular).

Ethical issues can make the implementation of triage challenging particularly for health workers. All teams need training in MCI management community ethics. This will help them save the greatest number of lives possible by focusing the limited resources on those who can be saved rather than the most gravely injured.

Basic Mass Casualty Incident (MCI) management

Basic MCI management is a series of steps that together meet the immediate health needs of disaster victims. It begins with a search and rescue at the disaster site and ends with either a referral to a health facility or release for home care. Figure below illustrates the general organisation of an MCI management field.

Figure 3-6: General organisation of a Mass Casualty Management field [19]
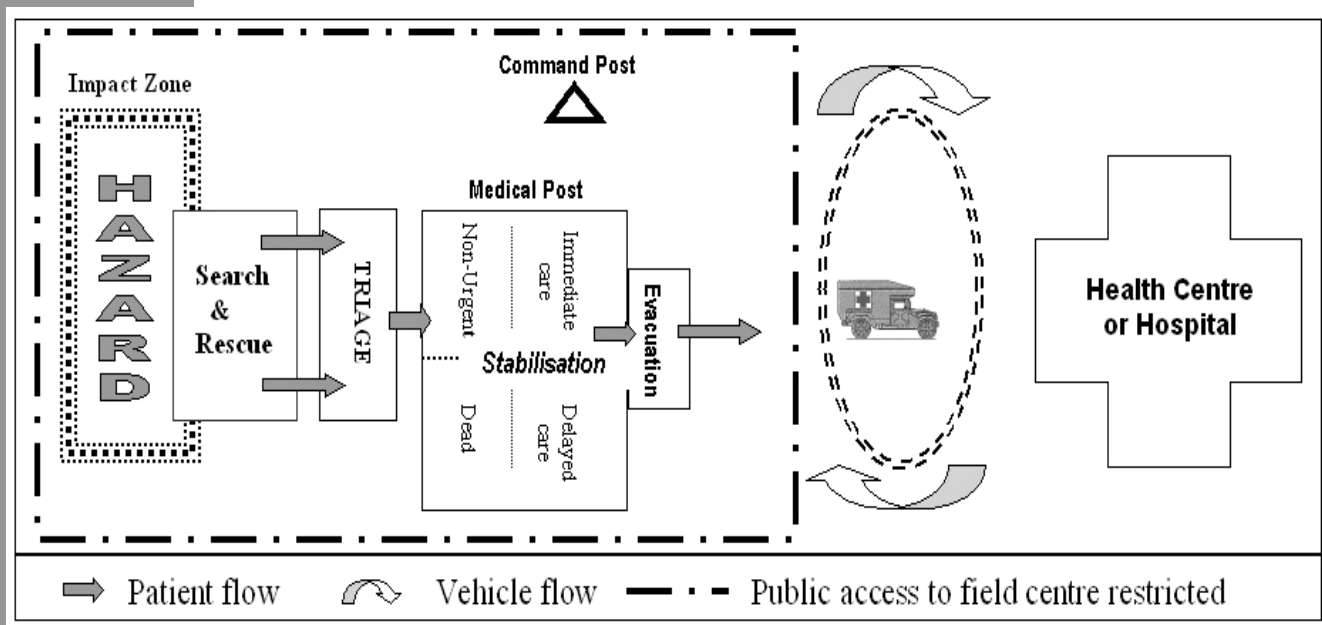
In a mass casualty management field, each team operates in a specific area to remove all victims from the disaster site and transport the critical cases to health facilities. The team's responsibilities are given by the **Rapid Assessment Team**, led by the Incident

Commander, who establishes the following information:

- The time and extent of the damage;
- The potential continuing danger from the disaster;
- The estimated number of casualties and exposed victims; and
- The resources needed for response.

A single map is created indicating the main topographical features, the victims, potential risk areas, access roads, etc.

The **incident commander** based at the command post has overall authority coordinating the multi-sector operation. The Command Post Team's responsibility is to set up the field posts and assess and report continuously on the general situation. The Command Post's location should be strategically placed close to the disaster centre but far enough from the centre so that risk of continuing danger is minimised such as down wind of a forest fire or chemical spill or high ground in a flood.

A **security team** protects restricted areas limiting any further danger from the disaster and to provide crowd control in order to ensure the safety of responders and victims.

The **search and rescue team's** priority is to locate and evacuate victims from the impact zone and transfer them to the medical post after assessing their status. The search and rescue team may provide to victims in the impact zone essential first aid measures such as control bleeding, maintaining clear airways, but this is not the time for cardiopulmonary resuscitation.

A **medical post** should be established as close as possible to the impact zone while again maintaining a safe distance. The medical post should be located in a building or shelter as soon as possible.

The **triage team**, under the leadership of the Triage Officer, tags, treats and releases patients from the medical post according to their health conditions. Each stage must be completed before the next step can be taken. The type of care given is limited to first aid and emergency medical care. Under limited resource conditions, such as staff shortages, the small emergency health team might be required to rotate within the medical post in order to attend all patients.

The **evacuation team** is responsible for the safe transfer of stabilised victims to a health care facility using the most appropriate transport and escorts available. Victims with minor injuries may be transferred by non-medical transport after all acute victims have been evacuated. Upon arrival at the hospital, every injured person must be re-triaged, reassessed, stabilised and given definitive care.

Many factors can affect the quality of triage such as the patient's condition, access to health facilities and the availability of resources as in information, hospitals, personnel and supplies. The monitoring of patients in the triage area might be prolonged if the stabilisation area is overloaded, if resources for evacuation are inadequate or the receiving facility requests a delay. If there is only one health care facility within a disaster region and the victims are stabilised in the field, transport can be staggered. This strategy helps prevent the health facility from becoming overwhelmed.

Triage

In a disaster medical response, triage sorts and prioritises victims for medical attention according to the degree of injury or illness and expectations for survival. Triage reduces the burden on health facilities. In an emergency, there are shortages of personnel, supplies and transportation vehicles. Triage should be carried out at various levels. By providing care to victims with minor or localised injuries, health facilities are freed to attend to more critical tasks. When health facilities cannot meet the needs of all victims immediately, it is appropriate to give the limited resources to those most likely to survive.

The goal of managing a mass casualty incident is to minimise the loss of life or disability among disaster victims by first meeting the needs of those most likely to benefit from services. The goal of triage is to identify critical injuries requiring life-saving intervention in the shortest possible time. Patients are categorised to determine their priority of treatment and transportation.[11]

Basic triage is done against 'absolute' rather than 'relative' considerations. Each patient's need for medical care is judged as being urgent or not urgent, based on the patient's condition rather than relative to other patients. Triage categorisation of patients is based on the following criteria:

▪ The *nature and life-threatening urgency* of the patients' present condition rather than the order in which they arrived, as is normal in emergency care facilities; and

▪ The *potential for survival* or the prognosis identifying those patients with the most urgent need for care which is counter-balanced by the availability of health care resources. This concept is critical and can greatly influence the overall survival rate of disaster victims.

> **Note:** the factors that aggravate the imbalance between medical needs and the required resources to meet those needs include:
>
> ▪ Lack of appropriate numbers and types of medical, nursing or emergency personnel;
>
> ▪ Poor access by rescuers and emergency personnel to the disaster site and to the disaster victims;
>
> ▪ Shortage of medical equipment and supplies;
>
> ▪ Limited availability of evacuation transport vehicles; and
>
> ▪ Inadequate availability of functional medical facilities with intact integrity.

The commonly used triage system is the classification of the patient's medical condition into four levels:

▪ Immediate medical care;

▪ Delayed care;

▪ Non-urgent or minor; and

▪ Dead or 'near dead.'

Please refer to reference for the Simple Triage and Rapid Treatment (START) colour coding system and the Secondary Assessment of Victim Endpoint (SAVE) secondary triage for more in-depth discussion of triaging systems.

There is a natural tendency to over-triage disaster casualties. Over-triaging of non-critical casualties or the expectant dead comes at the cost of time and attention or the 'immediate care' that should be given to the truly critical patients. Resuscitation of the hopeless casualties following Mass Casualty Incidents (MCI) often yields dismal outcomes and such heroic measures should be discouraged.

Table 3-2: Triage classification system.

Immediate care	Severely injured patients with a high probability of survival need procedures to prevent death. Examples include airway obstruction, inaccessible vascular wound with limb ischemia, incomplete amputation, unstable chest and abdominal wounds, pneumothorax, sucking chest wounds, deteriorating Central Nervous System (CNS) injuries, $2^{nd}/3^{rd}$ degree burns of 15% to 40%, severe medical problems such as DKA and cardiac emergencies.
Delayed care	Casualties do not require immediate life-saving intervention so treatment can be delayed. Examples include large bone fractures without circulatory compromise, uncomplicated major burns, head or spinal injuries, intra-abdominal and/or thoracic injuries (no bleeding), vascular injuries with controlled bleeding, most eye and Central Nervous System (CNS) injuries, and time-consuming surgeries.
Minor	Individuals who require minimal or no medical care are the walking wounded. Examples include superficial wounds, burns <15%, upper extremity fractures, sprains, abrasions and blast injuries without obvious problems.
Deceased/expectant	Pre-defined criteria should be agreed upon among all agencies involved in providing medical care and triage.

Triage is an ongoing process. It begins either in the field or when patients arrive at the medical post. It continues as patients' conditions evolve until they are evacuated to the hospital. Triage during overwhelming Mass Casualty (MCI) Incident differs from smaller mass casualty settings because the number of victims is vastly increased and medical treatment resources can become extremely limited or non-existent. Patients can remain on the field for prolonged periods of time. Triage does not have to be confined to one area. Simultaneous triage of many victims at one time and in different locations can take place. Multiple and continued evaluations must be done as patients' conditions can change at any time. As mass casualty management is a dynamic process, physicians and pre-hospital personnel must have an effective disaster plan that involves knowing how to work in an environment where the standard of care may change.

The following are some general rules for triage:

- In borderline cases, select the more urgent category;
- When children are involved, give them priority over adults *in the same triage class;*
- Give a higher priority than the medical condition warrants to victims with hysteria or hysterical relatives. They can be given priority for transfer to a health facility because it is important to control of and maintain calmness at the scene;
- Stabilise all patients before giving further care to any individual; and
- Definitive care such as cleaning and stitching wounds, antibiotic treatments, applying plaster for fractures etc. can be started once no more casualties arrive and all the injured are in a stable condition.

To avoid overwhelming health facilities, the most experienced clinician should be facilitating patient flow by managing triage. There should be at least one medical doctor on staff at the facility. Having female health workers is necessary to ensure access to care for female patients, especially in communities which are sensitive to communication between genders.

Emergency medical care

This section addresses some important components of emergency medical care, such as special health issues in emergencies, managing essential drug supplies, training and supervision of emergency health workers, monitoring and evaluation.

Mass event with long-term major implications

Clinical concerns and medical response

Emergency health care responses to disasters due to natural or human-made causes can be divided into the acute response phase and the external response phase. This section focuses on expected injuries and on the anticipated medical response needs in the acute phase before the arrival of external resources in a mass disaster event with long term implications.

The acute response phase is generally very short, ranging from twenty-four to seventy-two hours or until external assistance from governmental, non-governmental or international aid agencies can be organised and dispatched to the disaster site. In the acute phase, local health facilities are likely to be overwhelmed. It has been reported that up to 85 to 90% of earthquake survivors were rescued by the local population in the first seventy-two hours after an acute onset disaster.[2,4] In the 1992 Turkey earthquake, first aid training of uninjured lay survivors was significantly associated with a higher likelihood of saving entrapped victims.[??] It is, therefore, important for local facilities and health providers and even laypersons located in vulnerable areas to be prepared to provide initial assistance in a disaster.[4] This training should ideally be provided during the preparation and mitigation phases of disaster preparedness.

Clinical concerns

In a mass disaster event that overwhelms the disaster response capability of a large region, there are a number of clinical concerns that should be anticipated. Knowledge of the risks, vulnerabilities, type of likely disasters that may occur and the expected injury patterns will assist local responders in mounting a more effective response in the immediate aftermath of a disaster.

Certain disasters have a higher risk of causing injuries than others. Table 3.3 shows the expected injury patterns based on the type of disaster.[17,18] The most common causes of surgical emergencies and the highest causes of mortality in a disaster situation are earthquakes and wars.[3]

Table 3-3: Expected injury patterns by disaster[7]

Type of disaster	Expected injury pattern
Drought	Heat exhaustion, stroke, dehydration, renal failure, malnutrition and starvation
Earthquake	Fractures, blunt trauma, wounds, crush syndrome
Epidemic	Specific to type of infectious disease
Temperature extremes	Hypothermia, hyperthermia, frostbite, heat stroke
Slide	Blunt and penetrating trauma, crush syndrome, fractures, wounds
Volcano	Severe burns, crush injuries, respiratory infections/complications
Wave/surge/flood	Drowning, hypothermia, waterborne communicable diseases
Wildfire	Severe burns, respiratory complications
Windstorm	Blunt/penetrating trauma to head/chest (caused by flying debris), crush syndrome, fractures

Warfare	Penetrating injury, blast injury, chemical burns, illness from biological warfare, amputations

Medical response

A concerted effort to reinforce a hospital's existing surgical services should be performed before setting up of a new field hospital.[3] Military medical planners can be helpful resources for establishing a field hospital or surgical ward. Security of the humanitarian assistance workers must also be kept as a high priority.[15]

Only agencies that are equipped with the expertise required to implement surgical services, including bringing in adequate quantities of water, maintaining strict levels of hygiene, providing adequate anaesthesia and post-surgical care should attempt to do so.[20] It is recommended that planners review the types of injuries that might be present based on the disaster

Photo: International Federation

so that they can plan the surgical remedies needed.[15] In an earthquake, there might be more bony fractures that require surgical intervention whereas in armed conflict there might be more penetrating injuries or powerful weapons with blast effect resulting in delayed internal injuries.[2]

A specialised referral hospital which can perform surgeries and manage obstetric emergencies should be identified and made available to the affected population. Arranging transport to hospitals from the health centre should be made. It is also important to set up a referral system with strict guidelines to prevent inappropriate self referrals to the most specialised care. A continual information feedback system to the general practitioners at the more basic facilities is a key component of setting up a referral system.[3]

An important aspect of managing traumatic injuries in the field is to ensure that health providers are well versed in first aid and triage to ensure the greatest numbers of patients are efficiently treated.[2] These simple skills can significantly improve survival rates. Triage skills have already been discussed. Once patients have been appropriately triaged, they can be individually treated. Simple first aid measures that can be implemented in the field include:

- Removal of **A**irway obstructions;
- Assisting with **B**reathing, artificial respiration;
- Compression to control bleeding (**C**irculation);
- Immobilising broken bones;
- Pain control;
- Cleaning wounds, bandages; and
- Tetanus prophylaxis.

All victims of disaster should be examined first for the status of the airway, the presence and quality of breathing and the presence and quality of circulation such as pulses as highlighted above.

WHO has on its website a list of essential medicines and a description of the New Emergency Health Kit that consists of a basic and supplemental kit with enough medicines, disposables and equipment to care for 10,000 people for three months.[36]

Some skills that should be taught to local workers are beyond the scope of this text. In earthquake prone areas, training for structural collapse, search and rescue techniques is useful. Local providers and laymen if possible should undergo Basic Life Support training as outlined by the American Heart Association aw well as learning basic first aid techniques.[43]

Injuries and treatment

The audience is a local health worker who might not have received formal medical training. Some of the more common types of acute injuries listed in Table 11.5 are briefly discussed in this section. After stabilisation, most of the severe illnesses and complications will require transport to a referral hospital equipped with surgical and intensive care unit capabilities.

Trauma

Trauma victims face high morbidity and mortality risks. Advanced Trauma Life Support guidelines were developed for early recognition and management in order to reduce these risks. Immediate attention should be given to the **A**irway, **B**reathing and **C**irculation, the **ABC** of trauma assessment and treatment when evaluating trauma victims.

Immobilisation of the cervical neck spine is critical in care of any trauma victim. The endpoint of protecting the neck vertebrae is to prevent paralysis and disability. The initial control of the cervical spine is to instruct an assistant to hold the head. Then a stiff cervical collar or towels on each side of the head with tape across the forehead can be used to limit head and neck movement.

Inspect '**A**', the airway, of the **ABCs** of trauma assessment. Ensure the airway is patent. Ask the patient, 'How are you?' A clear response with quiet respiration indicates no airway obstruction. Hoarseness or pain with speaking indicates laryngeal injury, which can lead to obstruction. Look for foreign body or loose teeth in the mouth. If there is any decrease in mental status, one should check the gag reflex by probing the posterior pharynx with a tongue depressor. Absence of a gag reflex indicates a high risk for aspiration. Patients with severe facial injuries are at risk of bleeding or compression of the airway. Endotracheal intubation to protect the airway is indicated for patients with aspiration risk or severe facial injuries.

Inspect '**B**' for breathing. Check the chest and neck for respiration motion, trachea deviation, open chest wounds and breath sounds. Agitation or obtundation indicates hypoxia and carbon dioxide retention. Decreased breath sound on one side of the lung accompanied by tracheal deviation and low blood pressure might mean a collapsed lung under tension (tension pneumothorax). Immediate decompression of the pneumothorax with a large bore needle to the second intercostal of the chest is necessary, followed by chest tube insertion.

Inspect '**C**' for circulation. Check for signs and symptoms of poor circulatory perfusion: severe bleeding and low blood pressure leading to shock; confusion due to inadequate brain perfusion, poor radial or femoral pulse. If there is no pulse, start cardiopulmonary resuscitation while looking for reversible causes. If there is a weak pulse, place two large bore IV catheters (14 or 16 gauge) in the peripheral veins and give intravenous fluids of 10-20 mL/kg bolus. If there is no improvement of blood pressure and pulse, give blood.

Inspect '**D**' for disability. One should assess the level of consciousness, pupil size and reactivity, verbal response and motor function. This is the Glasgow Coma Scale. This information is very helpful to determine the neurological function of the patient.

The '**ABCD**' of the initial exam should only take one to two minutes to perform. One can then proceed to a more thorough head to toe **secondary exam**. When examining the back, the patient's neck needs to be immobilised and moved in unison with the rest of the body or 'log-rolling'.

The devastating outcomes of **blunt trauma** to the head or the body may not be obvious on initial evaluation. What can appear as bad looking bruises peripherally can result in concussions or bleeding in the brain, internal organ rupture or bleeding and fractures, compartment syndrome of an extremity and loss of extremity arterial perfusion. **Penetrating trauma** is the result of some penetrating injury anywhere on the body. Do not remove debris where bleeding might be controlled because this could result in uncontrolled bleeding. All trauma victims suffering from severe injuries should be transported to a hospital with surgical capabilities.

Head injuries

The primary cause of death in trauma is head injury, accounting for 50 to 55% of mortality. The concerns of head injuries are typically skull fracture, bleeding inside the brain (either subdural or epidural haematoma), brain swelling (cerebral contusion), diffuse axonal injury and concussion. Maintain the head and neck in line with the spine in any head injury because the neck and spine may also be injured. Head injuries can develop suddenly or over a period of time following trauma. Serious signs include disorientation, slurred speech, unequal pupils or blurred vision, vomiting, worsening headache, numbness or weakness in any extremity or drowsiness. If there is a sign of penetration into the skull, do not remove the debris. Cover with a clean or sterile if possible cloth. Transport to the nearest hospital for further medical support and treatment. A CT scan of the head must be done to detect any serious intracranial injuries.

Abdominal injury

Any penetrating abdominal injuries require hospital evaluation for the potential of intra-abdominal hollow or solid organ injury. The size to the external wound often grossly underestimates the degree of internal damage. Stab wounds to the lower chest may also carry the risk of intra-abdominal injury.

Blunt abdominal trauma injury pattern is often diffuse. All parts of the abdomen are at risk following a compression or crushing trauma. The sheering and stretching forces transferred to the hollow intestine can cause bowel rupture and bleeding. Solid organs are susceptible to laceration or fracture, particularly the liver and spleen.

In the presence of extra-abdominal traumatic injuries, assess for intra-abdominal injury, even when the patient does not complain of any abdominal pain. This is particularly true in patients who have confusion or low blood pressure. Signs that herald intra-abdominal injuries are abdominal wall bruising, distension and decreased bowel sounds. Up to 30% of the patients with bruising over the abdominal wall, also known as the 'seat belt sign,' have intra-abdominal injuries.

All patients with suspected abdominal injury require further hospital diagnostic evaluation, such as CT scan or ultrasound or diagnostic peritoneal lavage.

Extremity fractures

A broken bone is also known as a fracture. Differentiate a closed fracture, which might occur where the overlying skin is intact, from an open fracture where the overlying skin over the fracture is cut. Open fractures face higher risks of wound and joint infections and need immediate medical attention. Check the affected extremity for adequate pulse

perfusion. Fractures with dislocations must be reduced as soon as possible so that there is no compromise in arterial perfusion to the affected area distal to the dislocation.

The extremity that is affected should be immobilised or splinted to prevent injury to the surrounding blood vessels or nerves. Splints can be made of professional plaster or simple materials such as sticks and sheets wrapped around the extremity to keep it immobilised. Any open wounds should be covered with a clean cloth. Tetanus prophylaxis should be given. Patients with open wounds will need antibiotics and surgical treatment.

Crush syndrome

This syndrome, also known as traumatic rhabdomyolysis, is due to muscle breakdown with release of intracellular contents following a traumatic injury and prolonged pressure on an extremity. The prolonged crush injury to the extremity leads to a decreased blood flow and ischemia of the skeletal muscle. This in turn results in the breakdown of muscle tissue and release of free myoglobin, iron, potassium and phosphorus into the circulation system, which can damage the kidney. The classic symptoms include muscle pain, swelling, weakness and dark urine. Patients require large volumes of intravenous fluid hydration. Treatment is most effective if it is started early even while the patient is still under rubble and being rescued. Haemodialysis might be necessary if there is progression to renal failure.

Respiratory complications

In an explosion or volcanic eruption where there might be a sudden burst of pollutants and lung irritants into the air, many victims will develop inhalation injury and other respiratory problems. After the September 11 terrorist attack on the World Trade Centre, there was released into the air a large amount of dust and debris to which victims were exposed. The New York City Department of Health and Mental Hygiene have developed a registry for the long-term follow-up of persons who were affected by the World Trade Centre towers collapse. Since the incident, out of 71,437 enrolees in the registry, 56.6% have reported new or worsening respiratory symptoms such as shortness of breath and coughing.[44] Protect victims from further exposure to the irritant if possible. Wearing masks and the dampening of ash with water after an eruption can help reduce exposure. Evacuation might be necessary and some victims might require very specialised breathing support in an intensive care unit.

Heat exhaustion/heat stroke

Heat exhaustion occurs when the body cannot regulate its own temperature, resulting in a high body temperature of up to 104°F/40°C. This is often due to salt depletion and dehydration after strenuous exertion in high temperatures. The very young and elderly are most susceptible. Symptoms of exhaustion include weakness, nausea and vomiting, headache, dizziness, muscle cramps and pain. Heat stroke is extreme hyperthermia (above 40°C) and can result in organ failure and neurological complications. Symptoms of heat stroke include all the symptoms of exhaustion plus an elevated body temperature, confusion or disorientation, seizures, coma, hallucinations, blood in urine, and the patient may not be sweating. Treatment includes:

- Removing any excess clothing;
- Placing the patient in a cool or shaded environment;
- Covering the patient with a wet sheet or the patient can be sprayed with room temperature water and cooled with fans to maximise heat loss;
- Oral salt solution if the patient can drink or intravenous fluids if the patient cannot drink; and
- Ice packs to the underarms, groin area, and neck.

Do not use alcohol sponge baths. Avoid giving aspirin or acetaminophen to patients with high temperature due to heat stroke. Patients who develop seizures may require

benzodiazepines. Comatose patients may require intubation and ventilation that will require a higher level of care as well as a possible transfer to an intensive care unit for heat stroke patients. If no urine is produced and there are signs of renal failure, the patient will need haemodialysis, and possibly need to be transferred to an intensive care unit.

Hypothermia

In cold climates, victims of a mass disaster might be displaced from their homes and exposed to the elements. Hypothermia is defined as a core body temperature below 95°F/35°C. Patients should be kept horizontal and warm compresses applied to the trunk of the body, to the groin, underarms and neck. Extremities should not be warmed first because this can lead to cold peripheral blood with further cooling of the body core. Inhaled humidified and warmed air is effective in the field for hypothermic patients. Warmed intravenous fluids should be initiated in the axillaries and groin, or by placing a bottle against a caregiver's skin to warm the fluid if no other means are available. Patients should not receive alcoholic drinks. Patients should be handled very gently, not jostled nor manipulated because the heart in this condition has an increased risk of fatal dysrhythmias. Patients should not exert themselves if conscious and hypothermic which can lead to a core temperature drop or further cooling. Patients might need aggressive core re-warming techniques in a hospital.

Burns

First degree burns involve the most superficial layer of the skin or epidermis, are usually minor and can be caused by excessive sun exposure. The skin may be red and painful. Blistering does not occur. Cool fluid or cool compresses but not ice can be applied to the area. Pain relievers such as paracetamol (acetaminophen) or ibuprofen can be used.

Second degree burns are deeper burns. There may be pain, redness and blisters on the burned area. Assess the mouth for any signs of smoke or soot, which can indicate that the airway might be affected. The patient will require intubation for airway protection because inhalation injury to the airway might progress to airway oedema and respiratory compromise. Remove any jewellery around the burned area particular rings on fingers in case there is any swelling later. Remove clothing carefully because skin might be attached to burnt clothing. If this is the case do not remove any clothing. Cool water can be applied to the area and pain relief given. Intravenous lines might need to be started for fluid in case the burn is larger than 10% of the body surface area. Burnt areas should be covered loosely with clean sheets. Tetanus prophylaxis should be given. Do not put butter or oil on burns because this increases the chances of infection.

Third degree burns are deep full thickness burns involving the superficial and deep skin (epidermis and dermis). The skin is often pale, waxy, leathery appearing and painless. Scarring will occur. Again tetanus prophylaxis should be given. Intravenous fluids should be started and the burn covered with a cool clean sheet. Avoid cloth with fibres that may stick to the burn such as cotton wool. Patients with extensive deep second or third degree burns may require skin grafts. Patients should be transported to a hospital as soon as possible.

Fourth degree burns extend from the superficial to the subcutaneous fat, muscle and possibly bone. This life-threatening type of burn will require amputation and extensive reconstructive surgery.

Drowning

In case of flooding or wave surges such as tsunamis, drowning may occur. Once removed from the water, place the person on the back with the head and neck stabilised in the event of a possible neck injury. If the person does not respond and is not breathing, cardiopulmonary resuscitation should be initiated.

In near drowning or submersion injury, a fluid aspiration of 1 to 3 mL/kg can result in impaired oxygenation due to alveolar-capillary unit collapse (atelectasis) and pulmonary oedema. Pneumonia is a rare complication of submersion from aspiration of either stagnant or fresh water. Near drowning victims are critically ill and will need transport to a specialised facility with intensive care capabilities.

Skin infections

Wounds received during the disaster might become infected. Signs of infection include redness, swelling, pus drainage and pain. Infected wounds should be cleaned, dressed with clean gauze and antibiotic ointment and the patient treated with antibiotics and tetanus prophylaxis. Diabetics with infected wounds should be aggressively treated and educated on wound hygiene. Diabetics may require intravenous antibiotics and possibly hospitalisation and surgery if the wound infection progresses.

Another common skin infection that should be addressed is scabies. Scabies is a highly contagious skin disease caused by a mite. It is easily transmitted among close contacts. Signs include itching which is worse at night, small linear marks in the web spaces of the fingers, torso, genitals and breast areas. All the symptoms are in close contact with each other. Anti-scabies treatment with permethrin cream must include all persons living in the one household along with cleaning sheets and clothing. Clothes and sheets may also be placed in the sun away from people for two days as an alternative to laundering.

Disease outbreak

In any disaster where there is mass displacement and crowding of people in close quarters without shelter or access to clean water and proper sanitation, there is the risk of a communicable disease outbreak. There is more information about disease outbreaks in chapters 6 and 7. Common epidemics to be expected in emergency conditions are measles, diarrhoea, and acute respiratory infections. Compare the number of new cases in a current disaster situation with the baseline of previous years to ensure that number of cases can be classed as an epidemic. Endemic illnesses such as malaria might reach epidemic proportions during a disaster situation.[3] Training should be made available to local health workers through the ministry of health or through long standing health institutions in the area.

Understand and apply the case definitions and standard treatment protocols for the potential diseases in the area. Many standard definitions and treatment protocols exist already such as those published by WHO or Médecins Sans Frontières. The aspects regarding epidemics to be covered are:

- Specimen collecting for specific diseases to be sent to a designated referral laboratory;
- Performing rapid assessments and surveillance methods;
- Means for treating an infectious outbreak should be in place;
- Vaccines should be identified;
- Stocks of oral rehydration solution should be reserved;
- Intravenous fluids should be reserved;
- Items needed to set up clinics or augment clinic space should be reserved; and
- Mass immunisation campaigns should be carried out.[13]

Acute exacerbations of chronic medical problems

In any disaster, patients already suffering from chronic diseases such as diabetes, renal failure, emphysema or asthma might have severe exacerbations due to the inability to access medications or facilities. After Hurricane Katrina, which made landfall on the U.S. Gulf Coast on August 29 2005, the most common morbidity reported in evacuation centres in the four most affected states was chronic illness, comprising 33% of the 14,531 visits during the first three weeks after the disaster.[19] In the same period, the most

commonly reported morbidity among the 9,772 visits to health care facilities was injury (58%).[19] According to the Sphere Project, treatment for chronic conditions that were ongoing prior to the disaster should be continued in the emergency phase, particularly if 'cessation of therapy was likely to result in death' such as for diabetes and hypertension.[4] Although patients requiring haemodialysis would likely die with cessation of the dialysis, it is extremely difficult to maintain a clean and appropriate water supply for these patients in an acute disaster. Priority should remain on curative care for life threatening illness in the emergency phase including treating the complications of chronic disease such as infected wounds in diabetics.

Special clinical topics within health services

In organising the health system, the several areas that merit specific attention are:

- Malnutrition and Starvation. Any acute disaster, whether major with long-term impact or temporary, may highlight or worsen a pre-existing malnutrition problem. Multiple studies have shown a significant association between malnutrition and mortality rates in displaced populations and refugee camps.[3] Nutrient deficiencies can leave a population susceptible to disease such as measles. Service implementation methodology to counter malnutrition and starvation is detailed in Chapter 9; and

- Reproductive Health, which includes sexually transmitted diseases, sexual and gender based violence, safe motherhood and family planning. These must be addressed as soon as possible in the emergency phase. Chapter 4 has more information on reproductive health.

In the immediate situation, minimum requirements can be delivered through the Minimum Initial Service Package (MISP).[8] In addition to kits and supplies, MISP is a 'set of activities that must be implemented in a coordinated manner by appropriately trained staff'.[8] To assist with its implementation, the United Nations Population Fund (UNFPA) has designed a reproductive health kit consisting of three blocks of twelve sub-kits to use at the three different levels of health facilities. MISP objectives are to:

- Designate a person to implement the services;

- Prevent and manage sexual violence and its consequences. Providing emergency contraception, treatment of sexually transmitted infections and mental health support are key components;

- Reduce HIV transmission and practice universal precautions in health facilities such as gloves and eye protection for health workers;

- Guarantee the availability of free condoms;

- Provide clean delivery kits for home deliveries and health facility deliveries as well as implement a referral link for obstetric complications; and

- Plan for the integration and provision of comprehensive reproductive health services into the primary health system of the country as soon as possible.[8]

In addition, there must be female staff present to provide care and education to women. This will encourage women to access the clinics. Care must be provided in a culturally sensitive manner to encourage unmarried women, widows and men to access services. Please refer to the reproductive health chapter for further information.

Maternal and child health care services

Children under five have been shown to have the highest rates of morbidity and mortality in an emergency.[3,4] For this reason, it is imperative that children under five receive curative services that are geared to lowering excess mortality, such as measles immunisation and Vitamin A dosing, improvement of sanitation, oral rehydration therapy, and malaria treatment as per country protocols.[3,4] It is not always appropriate or possible to initiate an Expanded Programme of Immunisation in the emergency phase, but this programme should be reinstated during the integration of primary health care once resources are adequate.[3] Preventive public health messages should also be disseminated

amongst the pregnant women and mothers in the population through home visits about breast feeding and the early treatment for symptoms of potentially dangerous diseases such as diarrhoea and fever as well as antenatal care referral for pregnant women.

Mental health services

Many patients seen in the emergency will likely have witnessed traumatising events during the emergency or disaster. Programmes for the proper rehabilitation of patients suffering from mental health disorders should be initiated as early as possible, but might not be implemented until the post-emergency phase. Be aware that mental health problems might also be present in resettlement situations especially after temporary displacement due to the stress of rebuilding and resettling in an area that is known to be disaster or war prone. Please refer to the mental health chapter for further information.

TB control

A well run TB programme might not be possible during the emergency phase further contributing to multi-drug resistant bacilli and infectivity.[4] For this reason, TB control programmes are not commonly implemented until after the emergency phase in collaboration with the host country guidelines.[3]

Exit strategy

All activities performed should be in coordination with the local government health system and local personnel. The ministry of health should be involved from the beginning of programme development. After a disaster with long-term major implications, health care needs may not return to pre-disaster levels for many years particularly if health infrastructure has been severely damaged. Ideally, a government health centre or established local institution should be identified to take over health care response for the long-term during the initial stages of the emergency. Careful documentation of a strategic plan and targeted activities that follow a logical framework; clear training manuals and job descriptions; monitoring and evaluation of inputs, outputs, outcomes and eventual impacts; the development and continual improvement of health information systems; all these will make the transition to local personnel less prone to error or miscommunication. A sufficient number of local workers should be trained to take over the roles and responsibilities prior to the exit of the international NGO.

Mass event of immediate, limited implications

A mass casualty incident might occur for any number of reasons including a bus, train or plane crash, biological warfare, fire or explosive incident or a localised natural disaster. While most of these scenarios will result from a known incident, a localised communicable disease outbreak might be present insidiously with health providers noting an increase in the numbers of a particular disease. In this case, they must maintain surveillance records of the rise in cases and contact a public health organisation to help initiate an investigation into the causative agent.

In a mass casualty incident, usually the local health infrastructure will be intact. As a result, a reasonable medical response can be easily mounted within the existing system. Where a mass casualty incident occurs, it is imperative to have an integrated approach with rescue and pre-hospital care teams and the medical response teams in hospitals nearby. Disaster drills on absorbing a surge in the number of patients either through actual simulation or table top disaster simulations should take place to ensure all involved groups are aware of their roles and responsibilities. The medical response will depend largely on the type and size of disaster that has occurred. In a transportation accident such

as a plane, train, or bus, there will be prolonged extrication times for the victims who might have multiple fractures and burns with possible crush syndrome.

Exit strategy

A mass casualty event with limited implication will usually not require a complicated exit strategy due to the time frame. External assistance from the government or international organisations is often not needed. Victims may require assistance with rehabilitation and health care follow-up for surgeries which should be managed by the local health care infrastructure. Patients might need to be referred to specialised health care centres if resources are limited in the local context.

Intermediate events causing temporary displacement

Intermediate events causing temporary displacement include flooding and hurricanes and even armed conflict. In these events, people expect to return to their homes and lives within several weeks to several months. The condition of their homes and health infrastructure, however, might not be acceptable for utilisation on return.

Medical and clinical concerns

Many medical and clinical concerns are similar to those of mass events. Mass migration when combined with the interruption of public health infrastructure might give rise to potential infectious disease outbreaks as discussed above. A special medical concern that should be highlighted here is mental health. Often repatriation or return to the home area is viewed positively by international agencies, host countries and countries of origin. The victims of temporary displacement, however, might have witnessed traumatic events such as the killing of their entire family or the destruction of their livelihood such as stores, livestock or land.

There might also be the threat of further violence or another natural disaster in the area. Local mental health services, therefore, must be strengthened and reinforced even when victims are able to return to their homes after an intermediate event. It is a necessary component of health services in any of the types of disasters discussed in this chapter.

Exit strategy

In events of intermediate scale with temporary displacement, many victims will have fled to surrounding geographic areas. As victims return to their homes, there will be a need for reinforcing the infrastructure of the community health services based on assessments done in the region. More than likely in such an event, local and national staff should be available for staffing health services and responding to the disaster without a significant need for expatriate staff. Staffing and planning must be done in concert with the host government and ministry of health.

Mass event long-term displacement

When large numbers of victims are displaced because of a complex humanitarian emergency or large scale natural disaster, the victims might be displaced within their own country to become Internally Displaced People. The victims might find refuge in neighbouring countries or be relocated to countries far from their homes. When the victims are internally displaced because of political conflict and warfare as in Iraq, they are often the most difficult for international agencies to reach and assist due to security issues and the deliberate blocking of aid to victims by hostile parties. Victims escaping to neighbouring or far away countries might find themselves vulnerable to the new

environment. Refugee camp conditions are variable and might be overcrowded, have insufficient material for shelter and living space, inadequate quantity and quality of water and sanitation facilities, inadequate food and access to health care. These factors when coupled with mental stress from recent catastrophic events, result in refugees being vulnerable to disease outbreaks and susceptible to prolonged health problems which contribute to the excess mortalities seen in refugee camps. UNHCR leads the international coordination response for refugee protection.

Medical and clinical concerns

Complex humanitarian emergencies and natural disasters resulting in large numbers of displaced victims often result in increased morbidity and mortality due to close sheltering in refugee settlements.[3,4] Between 50 and 95% of deaths in these situations are due to one of four causes: measles, diarrhoea, acute respiratory infection or malaria.[3,4] Mortality is further exacerbated by malnutrition and poor access to a safe and sufficient quantity of water particularly among children.[3,4] It is imperative that mass immunisation campaigns against measles that has a high potential for outbreaks continue or are bolstered during this phase of the disaster particularly among displaced populations.[4]

Community outreach programmes can be involved in vital preventive interventions of disease surveillance and education of refugee beneficiaries. Selected members from within the refugee camp can be involved in community outreach programmes with home visits. These members usually can be trained in case definitions and simple symptom recognition to assist with compliance to immunisation campaigns and early disease detection. Home visitors are important to set up and spread awareness of other specialised health services. These specialised clinical health services will be required in the long-term in the context of a mass event that results in long-term displacement. These were discussed previously in the section 'Mass Event with Long Term Major Implications'.

In addition to communicable diseases, diseases that are specific to the geographic region or population during normal times should be expected such as malaria due to Plasmodium falciparum that requires different treatment in specific regions. Refugees might also be susceptible to certain types of trauma if there is warfare in the region. Trauma was discussed above.

Exit strategy

When delivering emergency health services in a complex humanitarian emergency, it is imperative to think of the exit strategy from the beginning of service initiation. Remember that there are many refugee camps that started out as temporary settlements, but have become semi-permanent lasting for years because of ongoing conflict or instability in refugees' countries of origin such as Sudan. Essential drug lists, diagnostic and treatment protocols must be in accordance with the host country. The host country's ministry of health must be involved in the development of the health services. Refugees must also be involved from the beginning in planning health services and be trained to take over long-term positions as appropriate in running various health service centres' operations such as managing essential drug supplies. Other necessary activities for human resource development were discussed under the 'Exit strategy' section of 'Mass event with long-term implications.'

Managing essential drug supplies

A standardised and effective drug supply is essential in any emergency health services delivery and response efforts. As well as allowing providers to treat their patients effectively, an operative drug supply helps patients gain confidence in the emergency health services and continue treatment as necessary. Health care providers must have access to standardised treatment protocols to ensure consistency of treatment among the affected population. Often the Ministry of Health protocols are not immediately available.

Providers, therefore, might have to start with the generic WHO standard protocols or Médecins Sans Frontières guidelines that are available on-line in several languages at http://www.msf.org/source/refbooks/msf_docs/en/msfdocmenu_en.pdf.

Guidelines are also included in the Interagency Emergency Health Kit (IEHK 2006, replacing the NEHK), which is a well known type of emergency health kit designed for use at peripheral and central health facility levels.[24]

IEHK has made considerable modifications to the kit, including significant changes in twenty-five items. Most importantly, the antibiotic spectrum and malaria treatment have been updated and malaria rapid test sticks are now included. It is available through WHO and other organisations. IEHK consists of a basic unit of ten boxes and a supplementary unit of fourteen boxes. The entire kit is sufficient to care for 10,000 people over a three-month period (based on four new cases per person per year). It includes medications, medical disposables, instruments and sterilising equipment. The basic unit is a stand-alone kit and is suitable for non-health professionals at peripheral clinics. The supplementary unit is only suitable for trained health professionals and is, therefore, useful for health centres and hospitals. The supplementary unit must be used together with the basic unit. There are various modules of medications that can be added or subtracted as appropriate in the context of the disaster such as anti-malarials, narcotics, psychotropic drugs and tramadol in the event that a license for narcotic drugs cannot be obtained.

Early in an emergency, the demand for prescriptions is high and certain drugs will be particularly in high demand depending on disease patterns and prescription habits. Drug consumption patterns and close monitoring of stocks is required to capture depletion as early as possible. It is essential that providers are trained about treatment protocols and appropriate use of drugs in this setting.

Logistics cycle

Medical supply management is a full time job in any development programme and particularly so in the emergency response phase of a disaster. The logistics cycle of drug management includes the selection, procurement, distribution and use of drugs:

- Drug selection entails choosing the type and quantity of drugs to be made available to the population;
- Procurement comprises all the decisions involved in buying a particular product including quality assurance, supply source and terms of payment;
- Distribution includes inventory control, storage, waste management and transportation; and
- Use of drugs comprises prescribing practices, the training of personnel and the education of consumers about appropriate drug use and dosage.

While there are common pitfalls in each part of the logistics cycle, many of them can be avoided.[12]

Selection

Selection pitfalls involve excessive, expensive or inappropriate drug purchasing. By using standard emergency health kits such as IEHK and by paying attention to national essential drug lists, this pitfall can be avoided. Providers must also understand that drug selection is usually a dynamic process that depends on:

- Changing demands in the current emergency (e.g. needing more analgesics in a post-earthquake zone for contusions);
- Geographic location (e.g. a malaria endemic region); and
- Population demographics and local culture (e.g. pain medicine substitutions because of the inability to obtain narcotic drug licenses).

Generic drugs are often preferable and cheaper. If a certain preparation has not been introduced before in the host country however, customs might refuse importation. In one case, a country refused to import metronidazole as a generic drug, but was happy to accept Flagyl which is approximately the same thing—the active component is metronidazole. It is worthwhile to ask the ministry of health which drugs have been accepted for import in the past.

Procurement

Some of the many procurement pitfalls include using unreliable suppliers, not maintaining firm contract terms that hold suppliers accountable for delivered drugs and not following up on drug quality. For local procurement, it is absolutely vital to

- Deal with a certified supplier;
- Follow WHO regulations for Good Manufacturing Practice and Good Distribution Practice;
- Use official inspections and independent quality control laboratories; and
- Make sure that certificates such as country of origin are all in place.

Many countries have a flourishing counterfeit drug production, so it is easy to make wrong decisions.

Contracts with suppliers must be specific in order to hold suppliers accountable for delivered drugs. A drug stored at an inappropriate temperature either too hot or too cold while it is being transported by the supplier to the purchasing facility might result in drug spoilage. There must be a contract term in place to handle such a situation.

When importing drugs, the WHO/Interagency guidelines on drug donation must be used. Donated drugs that are inappropriate or expired might take up limited storage space and consume the time and energy of the staff who must sort through them.[8]

Example: donations for Armenia

> 5,000 tons of drugs and medical supplies were sent to Armenia after the 1988 earthquake. However, only 30% of the drugs were immediately usable, and 20% ultimately had to be destroyed. Sorting through the drug donation inventory required 50 people for six months.[16]

For medical supply specifications, WHO regulations and descriptions see International Federation Emergency Relief Items Catalogue 2004.

Drug distribution

Drug distribution is a complex process with a potential for problems caused by miscommunication, misinformation and stock mismanagement. Some common problems that arise during drug distribution include:

- Delays at port and customs clearance;
- Theft because of inadequate security;
- Pest control issues;
- Inadequate temperature storage as a result of poor maintenance of distribution facilities; and
- Inaccurate information about quantities of supplies because of stock mismanagement.

The transport of particular materials might also be strictly regulated by organizations, such as the International Air Transport Association (IATA) regulations that limit the transport of certain corrosive materials and oxygen cylinders.

To prevent drug waste and ensure timely ordering of needed supplies, follow the FEFO rule in medical supply management: First Expiry, First Out. Proper and secure storage conditions with adequate temperature controls (refrigeration if necessary) and ventilation are important for maintaining drug quality. Drugs should also be well organised by their type such as by route of administration: internal, external, injectable and alphabetised so that they can be easily found. Within each administration route category, liquid and solid drugs should be separated. Liquid medications should be kept below tablet or dry medications to prevent possible spoilage of dry medications by leakage.

Use of drugs

The use of drugs involves educating both the health care providers and the patients. Ensure that the labels are in a language that can be read and understood by the providers and patients for proper prescription and dosage. As standardised treatment protocols are often not easy to access or find in the host country, generic WHO standard treatment protocols or Médecins Sans Frontières guidelines can be used at first. Note that the treatment protocols of various infectious and communicable diseases can vary greatly by region such as malaria.

While collaboration between local and expatriate staff is generally not a problem in emergency settings, disagreements and cooperation problems might arise about the use of drugs. Local doctors, for example, often ignore the ministry of health's standard treatment protocols and prefer to use the latest and often most expensive drugs. Prescription habits in many developing countries also include a multi-pharmaceutical approach. Inexperienced doctors might prescribe several antibiotics at the same time to the same patient with the hope that at least one will work.

Dosage should be clearly labelled for the patients. Instructions about drug use should maximise compliance and minimise drug selling and drug sharing among families.

Training and supervision

Hiring staff and planning them for any emergency are major undertakings that require more information than the scope of this chapter permits. Serious considerations include determining the availability and skills of local staff. Take into account a payment scale that is in accordance and relative to the local economy. This scale should not cause local staff to favour one organisation over another because of higher pay thereby disrupting the local economy.

Planners might encounter many challenges during the hiring process. Graduation and specialisation certificates are not always accurate. Planners can use testing to verify qualifications, but this method might significantly reduce the pool of candidates. Staffing shortages are further exacerbated by most staff not been keen about working far from urban centres. Hiring local staff can also be very complicated while labour laws and regulations can be quite strict. Using hiring agents or other mechanisms can be very helpful.

During emergencies, locally available health professionals might be victims themselves or be busy caring for their own families. Often, they are willing to work only part-time or for short periods, which is an administrative nightmare. This might result in a high turnover and repeated training. Nurses' training, responsibilities and skill sets also vary by country. Giving anaesthetic to patients, a normal responsibility for European and American nurses, is an unfamiliar task for nurses in many developing countries.

Training is important for maintaining team morale, which can suffer if staff members are not well prepared for the tasks they are asked to perform. There is generally not enough time to do significant training in the emergency phase of a disaster; therefore, the health staff already working should already have basic training. Work in an emergency situation might be quite different from normal duties and such specialised training is not always

provided. If there is a new skill being asked of the staff, or if it is observed that personnel are not performing tasks properly, training might be in order.

Training in the emergency phase has to be short and concise—and frequently repeated. Training should remain focused on specific topics that will be of use to the beneficiaries. The role of the various health workers must also be well defined and in accordance with national policy. Would community health workers be expected just to recognise illnesses and refer, or to recognise and treat some common illnesses? Clear role expectations will facilitate the integration of emergency health workers into the primary health care system in the post-emergency phase.

Médecins Sans Frontières (MSF) lays out specific recommendations about the training of emergency health staff.[15] Each trainer should have no more than ten trainees. MSF also recommends the following common training topics:

- Conducting mass measles immunisation;
- Data collection;
- Essential drugs and standard treatments;
- Conducting surveys;
- Environmental health measures;
- Specific measures to take during epidemics;
- Oral rehydration;
- Active screening for those who are sick; and
- Safe deliveries.

Training can be conducted in various ways such as 'on the job' or in small groups with lesson plans and demonstrations. Conduct the training efficiently during the emergency and keep it appropriate for the audience. Work with the national health authority also to determine whether there will be formal recognition of the training, which will help the participants further their careers. If there is not going to be any formal recognition of the training, this should be made clear to the participants.

Example: training in Pakistan

During the emergency response to the Pakistan earthquake, WHO officials conducted a half-day measles immunisation refresher course for a group of vaccinators working with International Federation including community health workers, pharmacists, doctors and nurses. In addition to familiarising everyone with the goals of the WHO measles campaign, this course ensured that the vaccinators possessed the skills to maintain the drug supply cold chain and give vaccinations to both infants and older children.

During the training session, break down tasks clearly, using the job description as a guide. This will also help with the evaluation. For example, if community health workers are to diagnose and treat diarrhoea, they must know how to ask the parent about the child's medical history, recognise the signs of diarrhoea during a physical exam and show the parent how to make an oral rehydration solution and administer it to the child. After training, community health workers can be individually evaluated based on their ability of asking about medical history, conducting a physical exam, making oral rehydration solutions and teaching others to do it.

Active supervision must be ongoing throughout the emergency phase. Supervisors must provide feedback so that staff can improve their performance and ensure quality and professional care. WHO states, the 'purpose of supervision is to guide, support and assist staff to perform well in carrying out their assigned tasks.'[23] Staff members with superior skills should be promoted to supervisory roles. Training local staff on the job to be

supervisors will support the sustainability of the programme as it is integrated into the primary health system.

Health Information Systems (HIS): monitoring and evaluation

In the emergency phase, assessments should be done quickly and efficiently to guide initial decision making. A rapid assessment template must be adapted for use in a disaster situation as discussed earlier in this chapter. This worksheet was used by International Federation in Aceh after the Pacific Ocean tsunami in 2004 and in Pakistan after the 2005 earthquake.

The details of developing an emergency and post-emergency phase health monitoring system are discussed in another chapter, but it is important to highlight a few points here. In the emergency phase, any health information system must be easy to establish, use and manage. In the first week(s), health information systems should monitor the five-to-seven most common diseases and the ones that need early attention such as measles. This information should be available by gender and age especially for children under five. It can be built up later into a more comprehensive system with data on birth and death rates in the affected target community, morbidity in the community and health facilities, medical activities such as consultations and walk-outs. If no particular template is available, the Sphere Humanitarian Charter and Minimum Standards in Disaster Response handbook (Sphere) basic format can be used. Excel spreadsheets are also helpful. Avoid sophisticated systems that are too time-consuming to manage. It is essential that the facts and figures can be transmitted over the Internet or even by SMS on mobile telephones. Data on clinic visits should be classified by age group, gender and illness as soon as possible in order to follow the proportion of clinic visits over time by vulnerable populations, particularly women and children under five.

Include members of the affected community in the data collection during the initial assessments; participatory health surveillance will promote sustainability of the health surveillance infrastructure. Home visitors and Community Health Workers should be trained in data collection, and a health provider at each level of the health system should be responsible for data collection.

Post-emergency phase

The post-emergency phase usually starts when excess mortality is controlled and basic needs are met. It is usually defined as the period when the crude mortality rate drops below 1 death per 10,000 population per day or back to approximately baseline pre-disaster levels. Maximum integration into the pre-disaster primary health care system is critical. In some post-disaster situations, that is after earthquakes, floods or hurricanes however, parts of the health care system might have been wiped out. Interim solutions such as prefabricated clinics and hospitals have to be introduced. Another dilemma is that some pre-disaster health care systems are so weak that integration might be very difficult.

During the post-emergency phase:

- Introduce psychosocial services;
- Reintroduce programmes such as the Expanded Programme on Immunization (EPI); and
- Reinstate the care and treatment of chronic illnesses and infectious diseases such as TB and HIV/AIDS.

This transition must be coordinated with the ministry of health and other organisations involved in the continued health care support.

Health Centre - Treguine refugee camp, Chad
Daniel Cima/International Federation of Red Cross and Red Crescent Societies

4

Reproductive health care

Reproductive health care

Description

This chapter provides guidance on key topics in reproductive health service delivery as applied to the provisions of services for emergency-affected populations. Sub-sections cover the areas of maternal health and safe motherhood, family planning, STI/HIV/AIDS, and sexual and gender-based violence (SGBV). The special reproductive health needs of adolescents are highlighted throughout the chapter. The guidance draws on the Humanitarian Charter and Minimum Standards in Health Services (the Sphere Project) with specific reference to reproductive health and further elaborates through other key references. Readers will gain important background knowledge in each of the topic areas, including an understanding of definitions and measurements used in reproductive health service delivery and ideas for programme design and implementation in both the earlier and later stages of an emergency. The chapters starts by explaining key references, and the Minimum Initial Services Package followed by sections on safe motherhood, family planning, the prevention of STI/HIV/AIDS, sexual and gender-based violence.

Learning objectives

▪ To define and understand the key components of reproductive health, HIV/AIDS, SGBV in emergency-affected populations;

▪ To understand the concept of the Minimum Initial Service Package and its key activities as the primary means of achieving minimal reproductive health standards under Sphere.

Key competencies

▪ To learn the definitions of basic reproductive health terms and understand the calculation of key measures;

▪ To be able to plan for needs assessment, implementation, and monitoring and evaluation phases of reproductive health, HIV/AIDS and sexual and gender-based violence activities for emergency-affected populations in the immediate and medium-to-longer term.

Introduction

Reproductive health care in emergencies is not a luxury, but a necessity that saves lives and reduces illness. Until recently, it has been a neglected area of relief work, despite the fact that poor reproductive health becomes a significant cause of death and disease especially in camp settings once emergency health needs have been met. The International Federation recognizes the importance of reproductive health in emergencies by stating, "Reproductive health in times of disaster is one of the most important technical areas to cover efficiently." [18]

Key facts

▪ 75% of most refugee populations are women and children including about 30% who are adolescents.

▪ 25% are in the reproductive stage of their lives, at 15-45 years old.

▪ 20% of women of reproductive age (15-45), including refugees and internally displaced, are pregnant[6].

▪ More than 200 million women who want to limit or space their pregnancies lack the means to do so effectively[67].

▪ In developing countries, women's risk of dying from pregnancy and childbirth is 1 in 48. Additionally, it estimated that every year more than 50 million women experience pregnancy-related complications, many of which result in long-term illness or disability[68].

Key resources

This chapter references both, the Sphere Standards and the Inter-agency Field Manual, as well as many of the other resources that have been developed in recent years to guide implementation of quality reproductive health services to conflict-affected populations.

Inter-Agency Working Group on reproductive health in crisis situations (IAWG)

Within the past ten years, the international community has placed ever-increasing emphasis on ensuring that the reproductive health needs of emergency-affected

A Red Crescent nurse attends to a new mother Photo: International Federation

populations are met. There are now many programmes, tools, and research activities focused specifically on this issue. The International Federation is a member of the Inter-Agency Working Group on Reproductive Health in Crisis Situations (IAWG) which was formed in 1995 and comprises UN agencies, governmental and non-governmental organizations, and academic institutions. The IAWG meets annually in order for member organizations to share experience and information, identify challenges, and establish mechanisms for collaboration. A significant contribution of the IAWG to address the reproductive health needs of conflict-affected populations is the Inter-agency Field Manual[37]. This document remains an excellent source of information about reproductive health service delivery in crises. In 2004, the IAWG published a report presenting its evaluation of progress toward reproductive health service provision for refugees and internally displaced persons over the previous ten years. The report authors observed that services to populations in stable settings are generally available, albeit with gaps especially in the areas of antenatal care (in particular syphilis screening and malaria treatment), better access to emergency obstetric care, more complete range of family planning methods, and more comprehensive services relating to HIV/AIDS, and sexual and gender-based violence. As well, the evaluation showed uneven implementation of the Minimum Initial Services Package (MISP) and noted that services often do not incorporate adolescents' needs. A key finding of the evaluation, however, was that access to reproductive health services for internally displaced persons is severely lacking. A video about the IAWG and efforts to improve reproductive health in conflict situations in the past 10 years can be viewed at - http://www.unfpa.org/emergencies/iawg/.

The Inter-agency Field Manual focuses identifies four key areas of reproductive health care for refugee and displaced populations:

- Safe motherhood (antenatal care, delivery care, and postpartum care).
- Family planning.
- Prevention and care of sexually transmitted infections (STIs) and HIV/AIDS.
- Protection from and response to sexual and gender-based violence.

As well, the manual also outlines the MISP, and highlights important considerations about adolescent reproductive health, and other reproductive health concerns in conflict-affected populations.

Sphere standards

International Federation programmes also rely on an equally important set of guidelines for the planning and implementation of quality reproductive health services in emergencies, the Sphere Project's Humanitarian Charter and Minimum Standards in Disaster Response (2004). This document outlines the minimum standard of services that should be made available to populations in humanitarian situations. With regard to reproductive health, there are two standards that are particularly relevant. The first located within the Control of Non-Communicable Diseases Standard 2: Reproductive Health, which is that "people have access to the Minimum Initial Services Package (MISP) to respond to their reproductive health needs". Under the Control of Communicable Diseases is Standard 6: HIV/AIDS which reads that "people have access to the minimum package of services to prevent transmission of HIV/AIDS".

The Minimum Initial Services Package (MISP)

This chapter begins with an overview of the MISP because it is the first response in emergency situations. In emergency situations, there is often an inherent competition between needs. Food, water, shelter and the control of disease outbreaks may all be pressing needs in a given situation. While it is often argued that the establishment of comprehensive reproductive health services in refugee and IDP settings takes time, the MISP is a package of materials and services which should be immediately put in place during the acute phase of an emergency, as recommended in both the Inter-Agency Field Manual on Reproductive Health in Refugee Situations, and the Sphere Standards (Non-Communicable Diseases Standard 2: Reproductive Health).

Women are more vulnerable than other refugees. Many mothers find themselves in the refugee camp raising their children alone. They bring their babies to the Red Cross centre to check their health and development. Photo: Daniel Cima/ American Red Cross

The MISP for reproductive health is a coordinated set of priority activities designed to: prevent and manage the consequences of sexual violence; reduce HIV transmission; prevent excess maternal and neonatal mortality and morbidity; and plan for comprehensive reproductive health services in the early days and weeks of an emergency. The MISP was first articulated in 1996 in the field -test version of "Reproductive Health in Refugee Situations: An Inter-Agency Field Manual (Field Manual), developed by the Inter-Agency Working Group (IAWG) on Reproductive Health in Refugee Situations. Unless a specific reference is given, the information provided in the MISP module is based on the Field Manual, which provides specific guidelines on how to address the

reproductive health needs of displaced populations from the initial emergency stage of a crisis through to reconstruction and development phases. The MISP is also a standard in the 2004 revision of the Sphere Humanitarian Charter and Minimum standards in Disaster Response for humanitarian assistance providers. To order copies contact info@womenscommission.org.

The MISP is based on documented evidence and an assessment, though generally desirable, is not necessary before implementation of the MISP components. The MISP is not a set of equipment and supplies. Rather, it is a set of activities that can be used as soon as possible[6].

Figure 4-1: Description of the minimum initial service package

What is the MISP?

- Minimum: Ensure basic, limited reproductive health services

- Initial: For use in emergencies, without site-specific needs assessment

- Services: Health care for the population

- Package: Activities and supplies, coordination and planning

The goal of the MISP is to, "reduce mortality, morbidity and disability among populations affected by crises, particularly women and girls. These populations may be refugees, internally displaced persons (IDPs) or populations hosting refugees or IDPs." [45, 55] The MISP includes five objectives, each with a set of activities, as highlighted below.

Table 4-1: MISP objectives and activities [55]

1. **Identify an organization(s) and individual(s) to facilitate the coordination and implementation of the MISP by:**
  ▪ ensuring the overall Reproductive Health Coordinator is in place and functioning under the health coordination team,
  ▪ ensuring Reproductive Health focal points in camps and implementing agencies are in place,
  ▪ making available material for implementing the MISP and ensuring its use.

2. **Prevent sexual violence and provide appropriate assistance to survivors by:**
  ▪ ensuring systems are in place to protect displaced populations, particularly women and girls, from sexual violence,
  ▪ ensuring medical services, including psychosocial support, are available for survivors of sexual violence.

3. **Reduce transmission of HIV by:**
  ▪ enforcing respect for universal precautions,
  ▪ guaranteeing the availability of free condoms,
  ▪ ensuring that blood for transfusion is safe.

4. **Prevent excess maternal and neonatal mortality and morbidity by:**
  ▪ providing clean delivery kits to all visibly pregnant women and birth attendants to promote clean home deliveries,
  ▪ providing midwife delivery kits (UNICEF or equivalent) to facilitate clean and safe deliveries at the health facility,
  ▪ initiating the establishment of a referral system to manage obstetric emergencies.

5. **Plan for the provision of comprehensive reproductive health services, integrated into Primary Health Care (PHC), as the situation permits by:**
  ▪ collecting basic background information identifying sites for future delivery of comprehensive reproductive health services,
  ▪ assessing staff and identifying training protocols,
  ▪ identifying procurement channels and assessing monthly drug consumption.

As highlighted in table 1 above, the MISP covers most of the four service components that are typically included in reproductive health programmes for conflict-affected populations. Table 4-2 below outlines key activities of the MISP within each of the programme areas, as compared to which additional activities should be undertaken as part of comprehensive reproductive health services. Additional details about MISP activities can be found in *Minimum Initial Service Package (MISP) for Reproductive Health in Crisis Situations: A Distance Learning Module*[55]. This document provides comprehensive information about MISP components and includes an on-line certification program, as well as a monitoring and evaluation tool, a sample project proposal for seeking funds to implement the MISP, and a helpful checklist (http://www.rhrc.org/resources/misp/). As well, the following sections of this chapter will also provide additional information about services that are part of both the MISP and comprehensive reproductive health programmes.

Table 4-2: MISP and comprehensive Reproductive Health (RH) services[55]

Subject area	Minimum (MISP) RH services	Comprehensive RH services
Family planning	Although family planning is not part of the MISP, make contraceptives available for demand, if possible.	▪ Source and procure contraceptive supplies ▪ Offer sustainable access to a range of contraceptive methods ▪ Provide staff training ▪ Provide community IEC
Sexual and gender based violence (GBV)	▪ Coordinate systems to prevent sexual violence ▪ Ensure health services available to survivors of sexual violence ▪ Assure staff trained (retrained) in sexual violence prevention and response systems	▪ Expand medical, psychological, and legal care for survivors ▪ Prevent and address other forms of GBV, including domestic violence, forced/early marriage, female genital cutting, trafficking, etc.
Safe motherhood	▪ Provide clean delivery kits ▪ Provide midwife delivery kits ▪ Establish referral system for obstetric emergencies	▪ Provide antenatal care ▪ Provide postnatal care ▪ Train traditional birth attendants and midwives
STI/HIV/AIDS	▪ Provide access to free condoms ▪ Ensure adherence to universal precautions ▪ Assure safe blood transfusions	▪ Identify and manage STIs ▪ Raise awareness of prevention and treatment services for STIs/HIV ▪ Source and procure antibiotics and other relevant drugs as appropriate ▪ Provide care, support, and treatment for people living with HIV/AIDS ▪ Collaborate in setting up comprehensive HIV/AIDS services as appropriate ▪ Provide community IEC

Some parts of the MISP rely on the availability of specific materials and supplies. The IAWG has designed the Interagency Reproductive Health Kit to facilitate the emergency response with supplies for a 3-month time period. The kit is divided into three blocks, all

of which can be ordered from the United Nations Population Fund, depending on needs and the population size. Each kit is in turn divided into sub-kits as follows:

Table 4-3: Contents of interagency reproductive health kit for emergency situations

Health facility/capacity	Material resources
Primary health care/health centre level: 10,000 population for 3 months	Sub-kit 0 Administration Sub-kit 1 Condoms Sub-kit 2 Clean delivery sets Sub-kit 3 Post-rape management Sub-kit 4 Oral and injectable contraceptives Sub-kit 5 STI management
Health centre or referral level: 30,000 population for 3 months	Sub-kit 6 Delivery Sub-kit 7 IUD insertion Sub-kit 8 Management of the complications of abortion Sub-kit 9 Suture of cervical and vaginal tears Sub-kit 10 Vacuum extraction for delivery
Referral level: 150,000 population for 3 months	Sub-kit 11 A - Referral-level surgical (disposable items); B - Referral-level surgical (disposable and reusable items) Sub-kit 12 Blood transfusion

Three of these kits have been incorporated into the International Federation/The International Committee of the Red Cross "*Emergency Relief Item Catalogue*" 2004, (safe delivery kits for pregnant women, safe delivery kits for Traditional Birth Attendants (TBAs) and safe delivery kits for health centres).

Depending on the kits to be ordered, the following information will be helpful to collect if possible.

▪ Percentage of women of reproductive age (15-49 years) in the population;
▪ Crude birth rate;
▪ Percentage of women of reproductive age who use modern contraceptives;
▪ Percentage of sexually active men in the population;
▪ Percentage of sexually active men who use condoms;
▪ Percentage of women of reproductive age who use female condoms;
▪ Prevalence of sexual violence;
▪ Percentage of women using modern methods of contraception who use combined oral contraceptive pills;
▪ Percentage of women using modern methods of contraception who use injectable contraception;
▪ Percentage of all women who deliver who will give birth in a health centre;
▪ Percentage of women using modern methods of contraception who use and Intra Uterine Device (IUD);
▪ Pregnancies that end in miscarriage or unsafe abortion;
▪ Percentage of women who deliver who will need suturing of vaginal tears;
▪ Percentage of deliveries requiring a c-section.

Additional details about the contents of each sub-kit and how it is ordered can be found at http://www.rhrc.org/pdf/rhrkit.pdf. As well, the International Federation is one of several

organizations that participated in the establishment of the *interagency emergency health kit* 2006 (IEHK, formerly the new emergency health kit (NEHK). This kit is designed to meet the first primary health care needs of a population that does not have access to medical facilities, and is not specifically designed for reproductive health services. Though some components of the IEHK 2006 are reproductive health-related, such as midwifery supplies, emergency contraception, and medicines for the post-exposure prevention of HIV and presumptive treatment of sexually transmitted infections, it specifically references the interagency reproductive health kit described above for more complete reproductive health supplies.

Indicators, based on the objectives of the MISP, can be used to assess the extent to which the MISP is being implemented in a given emergency situation. These include the following:

Monitor incidence of sexual violence

- Monitor the number of incidents of sexual violence anonymously reported to health and protection services and security officers;
- Monitor the number of survivors of sexual violence who seek and receive health care (anonymous reporting is of utmost importance).

Monitor HIV coordination

- Supplies for universal precautions: Percentage of health facilities with sufficient supplies for universal precautions, such as disposable injection materials, gloves, protective clothing and safe disposal protocols for sharp objects;
- Safe blood transfusion: Percentage of referral hospitals with sufficient HIV tests to screen blood and consistently using them;
- Estimate of condom coverage: Number of condoms distributed in a specified time period.

Monitor safe motherhood coordination

- Estimate of coverage of clean delivery kits;
- Number and type of obstetric complications treated at the Primary Health Care (PHC) level and the referral level;
- Number of maternal and neonatal deaths in health facilities.

Monitor planning for comprehensive reproductive health coordination

- Basic background information collected;
- Sites identified for future delivery of comprehensive reproductive health services;
- Staff assessed, training protocols identified;
- Procurement channels identified and monthly drug consumption assessed.

While application of the MISP in the emergency phase of a conflict or other crisis situation can save lives and protect the health of the population, implementation is not without challenges.

In addition to the indicators listed above, the Women's Commission for Refugee Women and Children has designed an assessment tool that in any given situation can help to systematically review the reproductive health infrastructure, personnel, and services available at the facility level, and implementation of various MISP activities. This is available at http://www.rhrc.org/pdf/MISP_ass.pdf.

4

Reproductive health care

Maternal health and safe motherhood

Pregnancy and childbirth are recognized health risks for women in developing countries. In general, it is estimated that 15 million women a year suffer long-term, chronic illness and disability because they do not receive the care they need during their pregnancy. Maternal mortality is the leading cause of death for women in most developing countries. The lifetime risk of maternal death for women in Africa is 1 in 15[6]. Women in crisis situations may already be pregnant or become pregnant at any point during displacement and it should be assumed that at least 4% of the total population will be pregnant at any given time [55]. The physical health of displaced women is often seriously depleted as a result of the trauma and deprivation associated with their flight.

Underlying risk factors for maternal deaths and illness, particularly severe in emergency situations, include:

- Inadequate pre-natal care which is necessary for the early detection of complications;
- Under-nourishment;
- Undesired pregnancies and induced septic abortion due to sexual violence and interruption of family planning services;
- Insufficient staff and resources for hygienic non-emergency deliveries;
- Inadequate referral systems and/or transportation for obstetric emergencies;
- Unsafe delivery and post partum follow up practices that cause infections.

Women exposed to one or more of the above risk factors may face an obstetric emergency. It is estimated that about 15% of pregnant women in emergency situations experience complications during pregnancy or delivery that are life-threatening and require emergency obstetric care [46, 55]. When such care is not available, the likelihood of maternal death increases. The causes of maternal deaths are generally consistent around the world. Sixty percent of maternal deaths occur in the postpartum period, and 45% happen in the first 24 hours after birth[23]. If no provision is made for emergency obstetric care they may suffer great pain, bleeding, and infection often leading to infertility and sometimes death. Long-term consequences include premature delivery, chronic pelvic pain, and increased likelihood of ectopic pregnancy and spontaneous abortion.

The table below defines the leading obstetric emergencies that can kill a woman within a short time.

Table 4-4: Leading causes of maternal mortality and morbidity

Five leading causes of maternal mortality and morbidity
Haemorrhage – may occur during pregnancy or delivery due to prolonged labour; trauma and/or rupture of the uterus or other parts of the reproductive tract; ectopic pregnancy; abnormal development and/or rupture of the placenta; abnormal bleeding associated with anaemia or coagulation disorders.
Sepsis – infection can arise after delivery, miscarriage or unsafe abortion when tissues remain in the uterus or if non-sterile procedures or instruments are used (e.g., frequent vaginal exams without gloves). Pre-existing STIs and prolonged rupture of the amniotic membrane before delivery increase the risk of sepsis.
Eclampsia – can occur in the latter stage of pregnancy or after delivery. It is characterized by uncontrolled fits, oedema, and/or elevated blood pressure during delivery and can lead to rupture of the liver, kidney failure, or heart failure and cerebral haemorrhage.
Unsafe Abortion – can lead to haemorrhage due to puncture of organs or an abnormal placenta, infection from unsanitary instruments and inappropriate procedures, or complications from an incomplete abortion.
Obstructed – can be due to small pelvis (because of physical immaturity or stunted growth), distorted pelvis, cervix or vagina (latter from FGM); irregular position of fetus prior to and during delivery.

The following table summarizes the percentage of maternal deaths due to each of these causes and the time frame in which they can lead to death if not properly treated.

Table 4-5: Maternal death causes, percentage of all deaths they contribute and time to death from onset of complication

Cause of maternal death	% of deaths	Time to death from onset of complication
Postpartum haemorrhage (bleeding after delivery)	25 %	2 hours
Sepsis (infection after delivery)	15%	6 days
Unsafe abortion	13 %	NA
Hypertension or eclampsia (high blood pressure or severe high blood pressure)	13%	2 days
Obstructed labour	8 %	3 days
Other direct obstetric causes	8 %	NA
Indirect causes such as malaria, anaemia, heart disease, or other pre-existing conditions	20 %	NA

While death is the most serious of obstetric emergency outcomes, those who do survive often suffer serious short or long-term illnesses. It is estimated that for each maternal death, 16 to 25 women suffer from illness related to pregnancy and childbirth, including:

- Fistula
- Laceration
- Uterine prolapse
- Infections
- Incontinence
- Anaemia
- Infertility

Most obstetric emergencies can be avoided if women, family members, and birth attendants can recognize the signs of emergency. The three delays are:

- Delay in recognizing a complication;
- Delay in deciding to seek health care/in reaching a health care facility;
- Delay in receiving appropriate treatment/quality care.

Reproductive health care

Table 4-6: Addressing the three delays

Delay	Common causes	Key interventions required
First delay	Need for emergency obstetric care not recognized or a decision is made not to access services.	▪ Improve awareness of danger signs among women, men, and families. ▪ Involve traditional birth attendants in early recognition and timely referral for women with obstetric emergencies.
Second delay	Women arrive late to the referral facility or the referral facility is too far away to access quickly.	▪ Improve referral system, including communication capacity and transportation mechanisms. ▪ Implement community finance and transportation schemes.
Third delay	Facility not staffed with competent or trained staff or equipped to provide the care needed, or woman cannot access the services.	▪ Improve coverage to meet the MISP. ▪ Improve the quality of services, clients' satisfaction, and 24/7 coverage. ▪ Improve use of services by reducing barriers and ensuring equitable access.

As highlighted in the table above under the key interventions column, care during pregnancy and childbirth involves women and their families, the community, and the health care system. Safe motherhood programmes focus on each of these levels in different ways through activities that cover antenatal care, delivery care, and postpartum care. Additionally, major efforts are underway specifically to improve facility level Emergency Obstetrical Care (EmOC) in general and for conflict-affected populations. The programme interventions described below cover each of these programme areas.

Maternal health and safe motherhood key facts

The following key facts show the widespread impact of inadequate maternal health care, especially in developing countries where many of the world's emergency-affected populations are located:

▪ Over 585,000 women die every year (an average of 1,600 per day) as a result of causes related to pregnancy or childbirth—almost all in developing countries[28].

▪ Another 15 million women in developing countries suffer acute complications that can lead to lifelong pain, illness, and infertility[28]. For the refugee population within the post-emergency phase, pregnancy and child-delivery complications are the leading cause of mortality and morbidity among women[44].

▪ Between 25-33% of all deaths of women of reproductive age in the developing world, is the result of pregnancy or childbirth[63]. It is the leading cause of death and disability for women between the ages of 15 and 49 in the developing world.

▪ Skilled attendants are present at only 53% of deliveries worldwide and only 40% of deliveries take place at a hospital or health centre[6].

▪ Unsafe abortion is a leading cause of maternal mortality world-wide, accounting for 70,000 deaths every year. Millions more suffer long-term health problems such as chronic infection, pain, and infertility.

▪ 50% of all prenatal deaths are due primarily to inadequate maternal care during pregnancy and delivery[28].

Safe motherhood programmes

As earlier stated, implementation of MISP activities related to safe motherhood do not require a specific assessment. (Additional information about assessments is available in the Epidemiology chapter of this book). However, some basic demographic data, as well as information the availability and quality of local maternal health services, will be helpful in considering needs in both the emergency and post-emergency stages. It is recommended that certain information be available when ordering Interagency Reproductive Health Kit for Emergency Situations, as indicated under the MISP section of this chapter. Additionally, the Interagency Field Manual for Reproductive Health in Refugee Situations provides the following guide to estimating the number of pregnant women in the population given various crude birth rates.

*Table 4-7: Estimating number of pregnant women in
the population if total population is 100,000*

	If crude birth rate is (per 1,000 population)	55	45	35	25
a.	*Estimated number of live births in the year*	5,500	4,500	3,500	2,500
b.	*Estimated live births expected per month (a/12)*	485	375	292	208
c.	*Estimated number of pregnancies that end in stillbirths or miscarriages (estimated at 15% of live births = a x 0.15)*	825	675	525	375
d.	*Estimated pregnancies expected in the year (a + c)*	6,325	5,175	4,025	2,875
e.	*Estimated number of women pregnant in a given month (70% of d)**	4,400	3,600	2,800	2,000
f.	*Estimated % of total population who are pregnant at a given period*	4.4	3.6	2.8	2

This is a weighted estimate of full-term pregnancies plus those pregnancies that terminate early [37]

The Centers for Disease Control and Prevention (CDC) have recently developed a set of assessment tools that include a section on safe motherhood to collect information from women in the displaced population about their pregnancy experiences and health seeking practices.

In order to assess the level and quality of the available facility and human resources in the community, field staff should also refer to the Assessment of MISP Implementation document referenced above, which includes sections on facilities (including an equipment and commodities inventory), available staffing and their qualifications, and services provided.

For the assessment of emergency obstetric care availability, field staff should refer to the *Field-friendly guide to Integrate Emergency Obstetric Care in Humanitarian Programmes*[55] which includes sections on demographic characteristics, health status of the population, UN process indicators on EmOC, local health care system conditions, human resources among the population, social organization, and community culture and practice. The guide also includes a "room-by-room assessment" of each of the facility rooms that should be in place to address emergency obstetric care needs, including the emergency room, labour/delivery room, change/scrub room, operating theatre, obstetric ward, pharmacy, laboratory and blood supply facilities, and the autoclave room.

4

Reproductive health care

Developing a plan

Field staff should be familiar with the key components of safe motherhood strategies to address maternal mortality and morbidity. MISP can help provide a template to start activities. These include the early recognition of complications and referral to higher levels of care, access to skilled attendants and emergency obstetric care, the management of unsafe abortion and post-abortion care, and family planning. Through these approaches, safe motherhood programmes aim to reduce high risk and unwanted pregnancies, reduce obstetric complications, and reduce the number of women dying from obstetric complications. Field staff should integrate the following specific strategies for care at the antenatal, delivery, and postpartum stages when developing programme plans.

Antenatal care

Regular antenatal care is a crucial factor in ensuring the health of both the mother and child throughout pregnancy. It is during antenatal care that health care workers can check important health indicators and look for any possible complications and/or risk factors. It is a fundamental component of safe motherhood. According to the International Committee of the Red Cross Antenatal Guidelines for Primary Health Care in Crisis Conditions, minimum antenatal services include:[16]

- Prevention of malaria and anaemia;
- Tetanus immunization;
- Personalized information for mothers.

Appropriate full antenatal care includes the following:

- Detecting and managing complications;
- Observing and recording clinical signs such as height, blood pressure, oedema, detecting anaemia, uterine growth, foetal heart rate, and presentation;
- Maintaining maternal nutrition;
- Promoting health;
- Using preventive medications such as iron foliate, tetanus toxoid immunizations, anti-malarials, and anti-helminthics.

Additional activities that can be integrated into this package of antenatal care include:

- Screening and managing tuberculosis, HIV/AIDS and STIs (especially syphilis);
- Health education, including danger signs, nutrition, family planning, breastfeeding, and HIV/AIDS.

Referring to higher levels of care if possible.

Safe delivery

If facilities for safe delivery are not available on site, referral systems need to be established and strengthened to ensure 24-hour access to emergency facilities. Delivery care interventions at the community level that can be undertaken by traditional birth attendants and/or community-based midwives include:

- Ensuring clean and safe delivery;
- Providing skilled assistance at delivery and postpartum;
- Recognizing, managing, and detecting complications early;
- Establishing 24-hour referral and transportation to emergency obstetric facilities;
- Support for breastfeeding (Please see the Food and Nutrition chapter for additional information on breastfeeding advice for HIV+ mothers).

As noted above, increasing emphasis is being placed on improving access to emergency obstetric care to address maternal and neonatal mortality and morbidity during delivery.

Emergency obstetric care

Emergency obstetric care (EmOC) is typically provided at the facility level. Depending on the level of health facility and the type of services available, EmOC services are divided into either basic EmOC or comprehensive EmOC:

Services a basic emergency obstetric care facility should provide:[55]

- Administer parenteral antibiotics, oxytocin, and anticonvulsants;
- Manual removal of placenta;
- Removal of retained products;
- Assisted vaginal delivery.

This includes most health centre and hospitals, and midwives or nurses with midwifery skills can deliver such services with supporting staff.

Services a comprehensive emergency obstetric care facility should provide: [55]

- All of the services a basic facility provides, above, and also;
- Caesarean section;
- Blood transfusion.

This includes hospitals with an operating theatres and surgical capacity. Usually requires a team of doctors, clinical officers, an anaesthetist, midwives, nurses, and supporting staff.

Postpartum care

Many maternal complications arise after delivery and postpartum care should not be overlooked in the design of safe motherhood programmes for displaced populations. Postpartum care focuses on both the mother and the newborn and includes the following components.

- Monitoring for danger signs and referral for further care as needed;
- Promoting newborn health, including thermal protection, eye care, cord care, vaccinations and support for breastfeeding (See the Food and Nutrition Chapter for additional insight into breastfeeding for HIV+ mothers);
- Newborn weighing and referral;
- Education;
- Postpartum family planning.

Implementing programmes

As with other reproductive health programmes for displaced populations, implementation of safe motherhood activities can be divided into those for the initial stage of the emergency (MISP) and others that follow as part of a comprehensive reproductive health programme. These include activities to be implemented at both the community and facility levels as distinguished below.

Minimum initial service package (MISP)

Programme interventions to reduce maternal mortality can be implemented at all phases of an emergency. In keeping with the Sphere standards, field staff should first focus on activities outlined in the MISP. To prevent excess neonatal and maternal-related deaths and illness, the MISP identifies the following activities: [64]

- Provide clean delivery kits for use by mothers or birth attendants to promote clean home deliveries;
- Provide midwife delivery kits (UNICEF or equivalent) to facilitate clean and safe deliveries at the health facility;
- Initiate the establishment of a referral system to manage obstetric emergencies.

Clean delivery kits for use by mothers, birth attendants, and midwives, as well as additional supplies for facility-based deliveries, the management of abortion complications, vacuum extraction for delivery, and kits for sutures and vaginal examinations are all available in the UNFPA Reproductive Health Kits for Emergency Situations.

To estimate the number of expected pregnancies in an area, start with the crude birth rate. For example, with an estimated crude birth rate of 3% per year, a population of 10,000 persons would be expected to have 25 births a month. When ordering supplies based on this calculation, always include enough extra from wastage.

The specific sub-kits that are relevant to the safe motherhood interventions include sub-kit 2 (Clean Delivery Kit), sub-kit 6 (Clinical Delivery Assistance), and sub-kit 8 (Management of Miscarriage and Complications of Abortion). The contents of the Clean Delivery Kit are described in the table below:

Table 4-8: Clean delivery kit contents

Type of kit	Contents
Part A: For individual delivery, to be distributed to every woman more than 6 months pregnant; 200 sets	Including one each of the following items ▪ Bar of soap ▪ Square meter of plastic sheet ▪ Razor blade (single edge) ▪ String for umbilical cord 3 x 15 cm ▪ Pictorial instruction sheet (clean delivery) ▪ Sealed bag for packaging ▪ Cotton cloth multicoloured 2m x 1m
Part B (for use by TBAs). This sub-kit is composed of materials based on an estimated 100 deliveries in a three-month time period, with 100 kits to be used for women delivering within the three months, and 100 kits for women who are 6-9 months pregnant.	Including 5 each per kits of the following items: ▪ Shoulder bag (with UNFPA logo) ▪ Gloves, examination, latex, medium, disposable – box of 100 gloves ▪ Flash light with batteries "D" 1.5 V ▪ Plastic apron ▪ Plastic rain poncho

Community-level activities

The following steps can be taken at the ***community level*** during the initial phase of the emergency.

Initial phase—Community activities
▪ Through, trained volunteers, community health workers and clinics, distribute Clean Delivery Kits to all visibly pregnant women and birth attendants. Make sure people know how to use them and promote clean deliveries. Clean Delivery Kits are for use in isolated or difficult circumstances. They can be made up on site or procured from UNFPA. Clean Delivery Kits consist of a square meter of plastic sheet, a bar of soap, a razor blade, a length of string, and a pictorial instruction sheet (see above);
▪ Identify a referral facility to which obstetric emergencies can be referred and establish mechanisms for referral.

At the health facility level, field staff should concentrate on the following:

Initial phase—Health facility activities

▪ Supply with professional midwife with the necessary instruments and medicines included in the IEHK 2006. The basic unit includes a variety of medicines and medical equipment that can be applied in deliveries, while the supplemental unit also includes magnesium sulphate for stabilizing severe pre-eclampsia and eclampsia prior to referral. Specific midwifery kits can also be ordered from UNICEF that are designed to cover 50 deliveries and include the necessary drugs and equipment plus basic steam sterilization equipment and basic resuscitation equipment. Set up a system to replenish these kits;

▪ At first may need to employ expatriates or health providers from host countries to manage referral health facilities;

▪ Upgrade skills and competency of health providers to manage normal and complicated deliveries and essential neonatal care.

Comprehensive services for safe motherhood

The MISP also calls on field staff to start planning for comprehensive reproductive health services at the time of the initial emergency. An important component of this process is ensuring that adequate emergency obstetric care is available. The following indicators should guide field staff in planning for the longer-term and measuring progress[55]:

▪ For every 500,000 population there should be at least four basic and one comprehensive emergency obstetric care facility;

▪ This minimum level should also be met in sub-national areas;

▪ 100% of women with obstetric complications should be treated in facilities offering emergency obstetric care;

▪ The case fatality rate among women with complications given care in emergency obstetric care facility should be less than 1%.

In order to achieve these indicators, field staff should concentrate on the following set of activities at the community and health facility levels.

Stable phase—Community activities

All of the activities in the initial phase, above, and also:

▪ Train people to recognize dangers;

▪ Set up emergency funds and transportation systems to allow transportation to referral centres 24 hours a day, seven days a week;

▪ Through community leaders, pregnant women and birth attendants, start community education on dangers signs to reduce the first and second delays;

▪ Promote regular dialogue with community leaders and client to improve quality of care and sustain use of facilities and services;

▪ Train birth attendants on active management of third stage labour to reduce risk of postpartum haemorrhage;

▪ Ensure that all relief agency staff are familiar with the guidelines on support of breastfeeding in emergencies and can implement these guidelines;

▪ Post partum care, avoiding and treating infections.

Stable phase—Health facility activities

All of the activities in the initial phase, above, and also:

▪ Refresher training and continuing education to maintain and improve competency of staff;

▪ Improve quality and use of emergency obstetric care services emergency obstetric care services;

- Coverage of basic and comprehensive emergency obstetric care services—appropriate health facility infrastructure, supplies, equipment and medications;
- Maintain 24-hour readiness and teamwork;
- Set up linkages with other programmes, such as malaria in pregnancy, prevention of mother-to-child-transmission of HIV, neonatal care, and focused antenatal care.

Essential equipment, supplies and drugs for the establishment of emergency obstetric care at the facility level are listed in the figure below:

Figure 4-2: Desired equipment for emergency obstetric care[69]

Infrastructure
- Electricity or generator
- Water supply
- Staff quarters
- Telephone/radio call/mobile phone
- Ambulance

Infection prevention
- Running water
- Soap
- Antiseptics, e.g. betadine, chlorhexidine
- Sterile gloves
- Non-sterile gloves
- Non-sterile protective clothing, e.g. aprons/macintosh
- Decontamination container
- Bleach or bleaching powder
- Prepared disinfecting solution
- Regular trash bin
- Covered contaminated waste bin
- Puncture-proof sharps containers
- Mayo stand (or equivalent for establishing sterile tray/field)

Assisted vaginal delivery
- Vacuum extractor (ventouse)
- Forceps

Anaesthesia and resuscitation
- Local anaesthetics, e.g. lignocaine
- Anaesthesia machine and inhalation agents
- Ketamine
- Spinal anaesthesia drugs and supplies
- Nitrous oxide
- Oxygen cylinder, mask, tubing
- Resuscitation supplies, i.e. Ambu-bag, oral airways

Caesarean section
- Sterile C-section instrument kits
- Sutures – various sizes
- Suction machine
- Sterile drapes, gowns
- Light –adjustable, shadow less

New born supplies
- Clean, dry towels
- Clean bulb syringe
- Ambu-bag, (with neonatal masks)
- Cord supplies (clamps/ties, scissors)
- Suction tubes for neonatal

Contraceptives
- Condoms (male and female)
- Diaphragms with spermicide
- Sub-dermal implants (e.g. Norplant)
- Low-dose combined oral contraceptive

- Progestin-only contraceptive
- Depot medroxy-progesterone acetate (injectable)
- Intrauterine device: copper-containing devices
- Diazepam Valium)
- Hydralazine/labetotol/nifedipine (antihypertensives)

Basic items
- Blood pressure cuff and stethoscope
- Kidney basin, placenta dish
- Cotton wool, gauze
- Laceration repair kits
- IV solution, tubing and needles
- Needs and syringes (10-20cc)
- Patient transport – e.g. wheelchair, gurney, hammock
- Delivery beds, ante- and postnatal beds
- Blankets

Antibiotics
- Ampicillin
- Gentamycin
- Metronidazole

Anticonvulsants
- Magnesium sulphate
- Calcium gluconate
- Diazepam (Valium)
- Hydralazine/labetotol/nifedipine (antihypertensives)

Uterotonic drugs
- Oxytocin
- Ergometrine
- Misoprostol

Removal of retained products
- Manual vacuum aspiration (MVA) syringes and cannulas
- Curettes, dilators
- Pelvic procedure instruments (i.e. speculum,/wide), tenaculum (several teeth, sound)

Pain management supplies
- Oral analgesics – paracetamol
- Parenteral analgesics
- Parenteral narcotics – e.g. pethidine, morphine
- Naloxone, promethazine

Blood transfusion
- Blood bags, including for neonatal
- Needles and tubing for transfusion, including butterfly fro neonatal
- Blood screening reagents, including Rhesus
- Microscope
- Refrigerator

Considering constraints and challenges

Maternal mortality has persisted as the leading cause of death for women of reproductive age due to a number of factors. Yet, maternal deaths are preventable deaths. Field workers should be especially attentive to some of the basic factors that can challenge success in this area of programme implementation, each of which is can delay the "three delays" described at the beginning of this section:

- Capacity level of peripheral health care staff, equipment and damage to health care systems, knowledge and TBA capacity Difficulties in implementing functional, quality emergency obstetric services;

- Lack of transport and communication systems needed for referral systems;

- Inadequate supplies and equipment for safe deliveries;

- Need for strengthening of TBAs and midwives in the necessary skills to effectively recognize danger signs and make timely referrals;

- Inadequate financial resources at the community level to assist women in need of outside care;

- Reluctance of women and/or women's families to seek care outside the home.

Additionally, the design and implementation of programmes should reflect the fact that these constraints and challenges need to be addressed simultaneously. Evidence indicates for example that the training of TBAs in and of itself does not impact maternal mortality. Likewise, it cannot be expected that a stronger referral system will help to stem maternal deaths if the quality of emergency obstetric services at the referral facility is not sufficient to address needs.

Human resources

The availability of appropriately trained human resources is discussed more in the management chapter of this book. At both the community and facility levels it is crucial to have the appropriate human resources to prevent maternal death and disability. There is general consensus that in order to effectively address maternal mortality and morbidity, women must receive care from a "skilled attendant" which is defined by UNFPA as "a medically qualified provider with midwifery skills (midwife, nurse or doctor) who has been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage, or refer obstetric complications. Ideally, skilled attendants live in, and are part of, the community they serve. They must be able to manage normal labour and delivery, perform essential interventions, start treatment and supervise the referral of mother and baby for interventions that are beyond their competence or not possible in a particular setting."

At the community level, TBAs most commonly assist at deliveries where women and their families decide to seek outside support. TBAs are not considered skilled attendants. Midwives are active both at both the community and facility levels. One TBA can be expected to look after 2,000 to 3,000 individuals. In turn, if assigned the task of TBA supervision, one midwife can work with 10 to 15 TBAs, reaching in total about 20,000 to 30,000 women[37].

At the facility level, the personnel needed for the implementation of emergency obstetric care are as follows:

Reproductive
health care

Table 4-9: Personnel needs for emergency obstetric care

Basic EmOC	Comprehensive EmOC
Midwife, nurse and supporting staff	OB/GYN
Lab and pharmacy staff	Anaesthetist
Administrative staff	Midwife, nurse and supporting staff
Security staff	Lab and pharmacy staff
	Administrative staff
	Security staff

The International Federation, through its member Red Cross and Red Crescent Societies has the possibility to implement various levels of the MISP including emergency obstetric care through volunteers at community level, health staff and Emergency response units (pre-packaged rapidly deployed units with skilled personnel medical equipment and support equipment).

Education/training/capacity building

Training of TBAs and midwives should be implemented after the emergency phase and as part of post-emergency recovery programmes. The MISP guidelines emphasize getting clean delivery kits to pregnant women as soon as possible during the emergency and point out that training of TBAs and midwives could divert attention from the need to establish quality emergency obstetric services. However, the organization of TBAs and midwives for the purpose of sharing information and providing supplies can be undertaken immediately. Once the situation has stabilized, TBAs and midwives can receive training that includes the following components.

While TBAs are not considered skilled attendants, they are nevertheless often the first point of reference for many women and programmes can build upon their strengths through training. Training for TBAs can include the following:

- Promotion of antenatal care and postnatal care
- Nutrition (including folic acid and vitamin A)
- Hygiene
- Tetanus immunization
- Clean delivery practice
- Addressing harmful practices
- Identification and referral for haemorrhage, sepsis, eclampsia, and obstructed labour
- Birth asphyxia
- Newborn care
- Breastfeeding
- Childhood immunizations
- Family planning
- HIV/AIDS

> The International Federation has undertaken training of TBAs in the recovery programme following the Gujarat earthquake in India 2001 and the earthquake in Pakistan 2005. Training TBAs is a key approach to improve the community's ability to cope in an emergency, when health services are likely to be dysfunctional.

Most maternal deaths are caused by obstetric emergencies that must be handled by a skilled midwife or clinician at the facility level. There is a wide variety of training manuals directed toward this cadre of health staff. The Averting Maternal Death and

Disability Program, with JHPIEGO, have created a comprehensive training programme that includes the following components:

- Interpersonal communication during EmOC
- Adult resuscitation
- Vaginal bleeding in early pregnancy
- Post abortion care (Manual vacuum aspiration (MVA) and post abortion family planning counselling
- Post abortion care (Manual vacuum aspiration (MVA)
- Post abortion family planning counselling
- Pregnancy-induced hypertension
- Using the partograph
- Conducting a childbirth
- Episiotomy and repair
- Repair of cervical tears
- Breech delivery
- Vacuum extraction
- Bimanual compression of the uterus
- Compression of the abdominal aorta
- Manual removal of placenta
- Vaginal bleeding after xhildbirth
- Fever after childbirth
- Newborn resuscitation
- Endotracheal intubation
- Caesarean section
- Emergency laparotomy
- Salpingectomy for ectopic pregnancy
- Laparotomy and repair of ruptured uterus
- Laparotomy and subtotal hysterectomy for removal of ruptured uterus
- Postpartum assessment
- Basic postpartum care
- Postpartum assessment and basic care
- Postpartum family planning
- Newborn examination
- Pregnancy-induced hypertension
- Vaginal bleeding in early pregnancy
- Elevated blood pressure in pregnancy
- Unsatisfactory progress in labour
- Fever After childbirth
- Vaginal bleeding after childbirth

Monitoring and evaluation

As with all programme areas, monitoring and evaluation activities depend on the establishment of appropriate indicators before beginning activities. Field staff involved in Reproductive Health activities should select indicators that will measure progress under the specific objectives of their programmes. The following indicators might be included depending on the focus of activities. It is important to consider these from the start of interventions and to establish baselines through assessments:

- Percentage of pregnant women who received clean delivery kits;
- Percentage of women delivering in the specified time period who had attended antenatal services at least once;
- Percentage of women delivering in the specified time period who were tested for syphilis during pregnancy;
- Percentage of women delivering in the specified time period who had been adequately vaccinated with tetanus toxoid;
- Percentage of women with obstetric emergencies who are treated in a timely and appropriate manner in the specified time period;
- Percentage of women who deliver in the specified time period who are attended by a trained health worker;
- Number of women of reproductive age who can name at least two danger signs of obstetric complications;
- Percentage of women delivered by caesarean section in the specified time period;
- Percentage of women with complications due to abortions who are treated in a timely and appropriate manner, in the specified time period;
- Percentage of women who have delivered in the specified time period who have received at least one postpartum visit[37]

Examples: Indonesia and Pakistan

- After the tsunami in Indonesia, an estimated 25,000 of 400,000 homeless were pregnant women (6%). Local health care systems could offer little help because most of the clinics were destroyed and many midwives killed[4].

- Among women of reproductive age (15-45) in Afghan refugee settlements in Pakistan, maternal-related deaths were greater than the deaths from all other causes combined[3].

Family planning

More than 120 million women say they want to space or limit their families, but currently do not have accessible, affordable, or appropriate means to do so. This problem is evident in emergency settings where a high number of women are struggling with unwanted, unplanned, and poorly spaced pregnancies, which can be hazardous to them and their children. Given the choice, many displaced women would prefer not to become pregnant and face the difficulties of childbearing in a camp setting. However, many do not have this choice since contraceptive services are often unavailable. Even where services do exist, many women may be unaware of the benefits of contraception. Others may be constrained from using contraception due to cultural mores or political pressure to rebuild the population.

Effective family planning programmes can assure couples of the internationally accepted right to reproductive health. This includes the material and educational means to achieve physical well-being and to limit or space children as desired. As in any setting, family planning can help adolescent girls and young women to delay childbearing and remain in school to complete their education and it is critical to ensure that family planning services and counselling are made available to adolescents.

Family planning plays a crucial role in helping women remain healthy by preventing unwanted or untimely pregnancies. Access to family planning services can help reduce maternal mortality and morbidity in camp settings by allowing women to limit and space their children effectively and prevent undesired pregnancy (which may lead to septic abortions). Unwanted pregnancies and the attendant increase in unsafe abortions are also by-products of a breakdown in social order which allows rape and prostitution to flourish.

The best guarantee of infant survival is to ensure the survival of the mother. Hence, family planning and birth spacing increase the chance that children will grow up healthy. Family planning also has positive long-term benefits for the entire refugee community. Smaller families allow women and couples to care for their children more effectively, manage scarce resources for health, education, food and housing, and undertake a greater range of income-generating activities.

Despite the many advantages to family planning, millions of women in developing countries, including crisis-affected populations are not using contraception. Reasons include lack of knowledge about contraception and fear of side effects, lack of family planning services, the belief in some cultures that women should bear many children, and opposition from partners and other family members.

Some contraceptives have added health benefits. For example, oral contraceptives can protect against certain cancers, while the condom provides protection against HIV/AIDS and other sexually transmitted diseases. The following section summarizes various contraceptive methods and considerations for their use in emergency settings.

Table 4-10: Contraceptive methods

Family planning method	Special considerations in a crisis-affected population
Male and female condoms	▪ The most easily distributed family planning method—no medical conditions prevent their safe use. ▪ The only family planning method that also provides protection against sexually transmitted infections, including HIV. ▪ Pregnancies among condom uses however, are higher than for other methods due to inadequate and/or improper use, at about 15 pregnancies over the first year of use. ▪ Displaced women may find themselves in a particularly low status position and at great pains to negotiate condom use with their partners. Education and information are crucial for use of condoms and should be started as soon as possible during the post-emergency phase.
Emergency contraceptive pills	▪ Hormonal pills given to a woman after unprotected sex. ▪ Delay or stop ovulation for that menstrual cycle. ▪ Are not an abortifacient—will not cause a woman to lose a fetus. ▪ Do not cause any harm or birth defects to a fetus accidentally exposed to emergency contraceptive pills. ▪ Prevent about 85% of pregnancies that would have occurred if no emergency contraceptive pills were taken.
Progestogen-only injectable (NET-EN, DMPA)	▪ Injections are administered every 2-3 months. ▪ About 3% of women using progestogen-only injectables over the first year will become pregnant. ▪ Irregular or prolonged bleeding in the first 3-6 months of use. Many women have infrequent bleeding or no bleeding at all after the first few injections, which may be attractive to a displaced population where access to sanitary products, soap, water, may be difficult. ▪ Thorough counselling about bleeding changes helps women continue to use the method. ▪ Require regular access to the injections and safe disposal of needles. ▪ A simple checklist can determine which women can safely use the method. ▪ Can safely be provided by paramedical personnel, including through community-based distribution. ▪ Cause about a 4 month delay in return to fertility once injectables are stopped.

Reproductive health care

4

Family planning method	Special considerations in a crisis-affected population
Combined injectables	▪ Similar to progestogen-only injectables, but also contain estrogen. ▪ Injections are administered every month. ▪ As commonly used, about 3 pregnancies per 100 women over the first year. ▪ Fewer bleeding changes and less amenorrhea than progestin-only injectables. ▪ Bleeding disturbances typically last a few months.
Combined oral contraceptives	▪ Pills are taken every day to prevent pregnancy. ▪ As commonly used, about 8% of oral contraceptive users become pregnant over the first year. ▪ Regular supply is crucial for continued use and successful use. ▪ Irregular bleeding occurs during the first three months of use, and then subsides. ▪ A simple checklist can determine which women can safely use the method. ▪ Can safely be provided by paramedical personnel, including through community-based distribution.
Progestogen-only oral contraceptives	▪ Ideal for breastfeeding women who need additional contraceptive protection. Does not affect quantity or quality of breast milk. ▪ Pills are taken every day to prevent pregnancy. ▪ As commonly used, about 1 pregnancy per 100 breastfeeding women over the first year of use. ▪ Regular supply is critical for continued use and successful use. ▪ A follow-on method is needed once breastfeeding is stopped. ▪ Prolongs duration of lactational amenorrhea. Irregular bleeding may occur once a woman's menstruation returns, but many postpartum women attribute it to being postpartum. ▪ A simple checklist can determine which women can safely use the method.
IUD	▪ A copper or plastic device that is inserted in the uterus through the cervix to prevent pregnancy. ▪ One of the most effective contraceptive methods, with only 6 to 8 pregnancies per 1,000 women over the first year of use. ▪ Using IUDs in emergency situations depends on the availability of supplies and health personnel skilled in insertion. IUDs are suitable where a displaced population is familiar with the method and is likely to have access to similar services upon return to country of origin and/or asylum. ▪ Access to follow-up is necessary, as the IUD may require removal or management of complications (generally rare events). ▪ The copper IUD can also be used as an emergency contraceptive, which then continues to provide women with contraceptive protection.
Implants (Norplant, Jadelle, Implanon)	▪ Small plastic rods that are inserted under the skin of the upper arm, containing a progestational hormone. ▪ Last 3, 5, or 7 years, depending on which implants are used. ▪ About 1 pregnancy per 100 women over the first year of use. ▪ Require trained provider for insertion and removal. Removal upon demand must be available in the countries of origin or final destination. ▪ Cause irregular, prolonged, or infrequent bleeding during the first several months of use. Bleeding becomes lighter and more regular at about one year.

Family planning method	Special considerations in a crisis-affected population
Lactational Amenorrhea Method (LAM)	▪ Fully or nearly fully breastfeeding will protect a woman from pregnancy if she also is not menstruating and her infant is less than six months old. If any one of these three criteria is not met, then an additional method of contraception is advised. ▪ Progestin-only pills are a good choice for women who are breastfeeding. ▪ About 2 pregnancies per 100 women during the first six months of use.
Sterilisation (male or female)	▪ Permanent methods of contraception that require minor surgical operation. ▪ Requires skilled medical staff. ▪ For men and women who want no more children. ▪ For vasectomy, 2-3 pregnancies per 100 partners over the first year. ▪ For female sterilization, 5 pregnancies per 1,000 women over the first year.
Spermicides	▪ Come in vaginal foams, suppositories, tablets, creams, or films. ▪ One of the least effective family planning methods—29 pregnancies per 100 women over the first year of use. ▪ May increase the risk of acquiring HIV with frequent use.
Fertility awareness-based methods	▪ Methods that track the fertile period of a woman's cycle. ▪ Includes basal body temperature (BBT) method, cervical mucous method, calendar/rhythm method, and standard day's method (SDM). ▪ 20 pregnancies per 100 women over the first year of use. ▪ Requires abstaining or using another method during the fertile period.

Emergency contraception

Emergency post-coital contraception may be particularly appropriate for displaced populations with high levels of sexual violence. A rise in sexual violence may also occur after a natural disaster. There are two methods of post-coital contraception that are effective: the combined oral contraceptive (also known as the morning-after-pill), and the copper IUD. There are types of oral contraceptives that are specifically designed as Emergency Contraceptive Pills (ECPs). One contains progestin only, and the other contains both progestin and estrogen. When neither of these two pills is available, it is also possible to use increased doses of regular oral contraception. It should be understood from the outset that neither the oral contraceptive nor the copper IUD method causes abortion. Instead both inhibit ovulation and the development of the uterus lining, which is necessary for implantation and growth of a fertilised egg. In this way, the reproductive system is made temporarily unsuitable for conception. Emergency contraceptive pills should be taken as soon as possible after unprotected intercourse and should not be taken after 120 hours (5 days). The possible side effects of emergency contraceptive pills include nausea, vomiting, irregular bleeding, and other (headaches, breast tenderness, dizziness, fatigue). Additional information about both ECPs, including the proper ECP dosages, and use of the IUD as emergency contraception can be found in the RHRC Distance Learning Module "Emergency Contraception for Conflict-Affected Settings.

Note: Emergency contraception should not be used as a long-term family planning method.

Emergency contraception must be made available from the initial phase of the emergency program, as an intervention for the physical consequences of rape. Field staff should be trained to recognise victims of sexual violence and encourage them to pursue medical attention in order to offer them the option of emergency contraception. Emergency contraception is included in the Interagency Emergency Health Kit 2006.[31]

Field staff who are involved in the establishment of family planning services and/or medical services for rape survivors should also refer to the RHRC distance learning module:

Emergency contraception for conflict-affected settings, available at www.rhrc.org.

Family planning key facts

- Worldwide, 350 million couples lack access to safe, effective and affordable family planning[63].

- 80,000 women die every year from unsafe abortion[6].

- Family planning can prevent 25-30% of all maternal deaths[70].

Planning family planning programmes

An important component of the MISP is to plan for the establishment of comprehensive reproductive health services as soon as the situation allows, including family planning. As part of this, field staff should include in any reproductive health assessment the necessary information to determine the population's contraceptive prevalence (proportion of women who are using, or whose partner is using, a form of contraception) and preferred methods of contraception[55]. As well, field staff can use a variety of qualitative and quantitative methods to assess the population's attitudes about and experience using contraception, the attitudes and knowledge of health care providers within the crisis-affected population, and the host population, with regard to family planning and specific contraceptive methods.

Some important issues to cover in the assessment of the community perspectives on family planning include[6]:

- Ideal family size, ideal timing and spacing of births;
- Knowledge and use of contraceptive methods;
- Attitudes and practices regarding abstinence;
- Sources of family planning information and services;
- Religious perspectives on family planning;
- Attitudes and practices regarding abortion;
- Men's participation in family planning;
- Changes in attitudes since being forced to migrate;
- Barriers and facilitators to accessing family planning services;
- Perceptions about the quality of family planning services;
- Adolescent perspectives on family planning and contraceptive methods.

The Centers for Disease Control and Prevention (CDC) have recently developed a set of assessment tools that include a section on family planning to collect information from women in the displaced population about their knowledge of, and opinions about, various forms of family planning and childbearing plans. The assessment tool is available at (http://www.cdc.gov/reproductivehealth/Refugee/PDF/Appendix.pdf). The International Federation also developed an emergency needs assessment methodology in 2005 with a specific health component including reproductive health.

As noted in the following sub-section, field staff should also collect background information about the population's fertility and contraceptive use trends in the country of origin (if displaced outside the country) and the locally available family planning services that the population may be able to access. When assessing the extent of family planning services already available, field staff should consider the accessibility, availability, and acceptability of services, organization of service delivery (facility-based and community-based), the technical competence of family planning service providers, the reliability of

the contraceptive supply system, and the extent to which clients' rights to full information, a range of contraceptive methods, and respectful service is in place.

Developing a plan

During the acute emergency phase, promoting and freely distributing condoms is necessary to prevent STIs and HIV transmission and unwanted pregnancies. As well, emergency contraception is an important component of the MISP. In the post-emergency phase, family planning programmes should be established to provide individuals and couples with effective counselling, a choice of contraceptive mechanisms, adequate follow-up, and general information, education, and communication campaigns. There are several key elements of family planning service delivery that should be part of a comprehensive reproductive health program. These are[6]:

- Needs and resources assessment
- Supplies and logistics
- Service delivery standards and protocols
- Service delivery sites
- Human resources: training and supervision
- Community involvement
- Information, education, and communication activities
- Commitment to high quality
- Information system; monitoring

Needs and resources assessment

The reproductive health team in charge of planning a family planning project should take into account the family planning environment that existed within the host country prior to flight (i.e., coverage and common types of family planning methods and outreach approaches used). This should be available from pre-existing data including national reports from the country of origin (e.g. Demographic and Health Survey, UNICEF MICS, and/or Ministry of Health reports). If the conflict-affected population has access to pre-existing health facilities, an assessment of the family planning capacities of those facilities should also be done. The Reproductive Health Response in Conflict Consortium (RHRC) Reproductive Health Needs Assessment Tools (www.rhrc.org) includes a component for Health Facility Questionnaire and checklist that highlights family planning as well as other reproductive health services.

Supplies and logistics

Without the necessary supplies and logistics, it is not possible to get family planning to the people who need and want it. In the emergency phase, family planning supplies can be obtained through the Interagency Reproductive Health Kit for Emergency Situations (see sub-kits 1, 4, and 7). As well, emergency contraception is included in the Interagency Emergency Health Kit 2006. As part of planning for the post-emergency phase reproductive services are established, field staff should investigate where and how to obtain family planning supplies locally and establish a logistics system that includes information about stock on hand, the rate of consumption, and the amount of stock loss or other adjustments. This information is based on stock keeping records, stock transaction records, consumption records, summary reports. More detail can be found in the Contraceptive Logistics Guidelines for Refugee Settings (1996), including how to calculate the supplies that will be needed. If it is not possible to procure the necessary family planning supplies locally, field staff may need to set up their own purchasing system temporarily. As soon as possible this should be integrated into the local contraceptive logistics program.

4

Reproductive health care

Service delivery standards and protocols

As in any area of public health, the delivery of family planning services should be undertaken within the established national standards and protocols to the extent possible. As part of the planning process it is very important that staff collect and familiarize themselves with the national family planning guidelines (contact the Ministry of Health and/or local health officials), as well as protocols from the population's country of origin (if a refugee population) and relevant international standards (see for example, The World Health Organization's Reproductive Health Library, available on-line at http://www.who.int/reproductive-health/rhl/index.html).

Service delivery sites

Field staff should ensure that family planning services are integrated into other primary health care service delivery sites in a way that ensures easy accessibility to those who need it. In addition to offering family planning as part of an overall reproductive health service package at the health centres serving the population, field staff should investigate the need and feasibility of a planning community-based family planning programme as well. There are many models for community-based distribution of family planning that have worked well in various settings to address the needs of women and couples outside of the clinic setting. This can be done through stores or individuals specifically designated and trained to provide contraception to women and couples who may find it difficult to access the health centre.

Human resources: training and supervision

In planning for comprehensive family planning services, field staff should first ascertain how many people in the community may already have experience and training in family planning services. Whenever possible, field staff should seek out those individuals with previous knowledge, provide refresher training as necessary and complement existing local capacities with new staff from the community who receive the needed training. Some of the key areas to consider in terms of human resource training are technical competence, interpersonal skills, communication skills, and administrative skills[15]. There are many family planning training publications available and again, field staff should consult with the local health authorities about the curriculum they use in order to incorporate key aspects and family planning trainers who are familiar with both the relevant protocols and the local environment. Support supervision is critical to ensuring quality care and field staff should plan for the regular supervision of both clinic-based and community-based family planning staff. If possible, this should be done in conjunction with any on-going national-level support supervision programmes.

Community involvement

It is especially important that community members have active input into the design of family planning programmes given the potentially sensitive nature of sexual and reproductive health issues within local cultures. In some cases, effective community health committees may already exist and can be important partners in the design process. As well, field staff should actively seek the input of different groups within the community, including adolescents, men, and others who may have special needs or concerns. It is equally important to consult with traditional leaders, women leaders, religious leaders, and local health service providers including Traditional Birth Attendants (TBAs) and others involved in reproductive health services, and service providers who address other aspects of public health in the community. These stakeholders can provide very important guidance on how to establish services in a way that will be most accessible to the women and couples who need them.

Information, education, and communication activities

Information, Education, and Communication (IEC) activities can take a wide variety of forms, including one-on-one counselling between the health care provider and client, individual discussions between peers, group information sessions, mass media and communication, and many others. Information can be spread through printed materials, video, radio and other means, in schools, in markets, in community meetings, or in other readily-accessible locations. To develop an IEC strategy, field staff should be clear about what information is lacking in the community, what strategy to develop and how the strategy can be monitored. The following steps will be helpful:

- Conduct a needs assessment;
- Set a goal around what you hope the target audience will learn or do as a result of the IEC;
- Establish learning and/or behavioural objectives that support the overall goal;
- Develop the IEC activities (develop the key messages, pre-test them, and decide what are the best mechanisms for dissemination);
- Identify potential barriers and ways to address possible problems;
- Identify the needed resources, key partners, and any other forms of support needed;
- Create an evaluation plan that will establish whether or not the IEC activities were successful based on the goal and objectives.

Commitment to high quality

Quality of care in family planning, as in other areas of health service delivery, is crucial for the success of programme investments and addressing the population's needs. The design, improvement, and evaluation of the quality of care should focus on both the provision of care according to technical standards, and the expectations of community members who are using the services. Some of the key aspects of quality care in family planning include the following:

- Choice of methods
- Information given to clients
- Technical competence of providers
- Interpersonal-relations
- Mechanisms to encourage continuity
- Appropriate constellation of services

Information system; monitoring

The family planning programme should be included within the rest of the health information system that has been described in the Health Systems and Control of Communicable Disease chapters. Additionally, the following client information should be recorded at each visit both for client monitoring and as part of the overall family planning information system[6]:

- Date
- User name or identification number
- User information (age, parity, address)
- Method of family planning selected
- Side effects experienced
- Type of user (new, repeat, etc.)
- Reason for discontinuation, if any, or switch to other method
- Date of next scheduled visit

Reproductive health care

4

Implementing programmes: Minimum initial services package

According to the MISP, family planning is not a priority reproductive health area during the initial stage of an emergency and no specific services are outlined during the short-term. However, the MISP does indicate that contraceptives should be available on demand to the extent possible, and that free condoms should be made available. As well, medical care for the survivors of sexual violence, which is highlighted in the MISP, may include emergency contraception.

Initial phase—Community activities
- Through community health workers, food distribution networks, and clinics, make male and female condoms readily available;
- Particularly focus on informing women about rape treatment and emergency contraception and where it is available.

Initial phase—Health facility activities
- Make oral contraceptives and injectables readily available to previous users of the methods;
- Be able to keep up with spontaneous demand for family planning;
- Provide rape treatment, including emergency contraceptive pills.

Implementing programmes: comprehensive services for family planning

Stable phase—Community activities
- Through discussion with key informants, focus group discussions etc., explore the attitudes of different groups to contraception, contraceptive decision-making, family size etc.;
- In collaboration with key informants, develop an IEC campaign to promote birth spacing/family planning (e.g. focusing on birth spacing and birth timing as important health measures for mother and child);
- Train community-based distributors, TBAs and health care providers to promote family planning within the community; to distribute condoms, combined oral contraceptives, and injections, and to recognize and refer complications of method use to the clinic. The International Planned Parenthood Federation offers comprehensive guidelines on the provision of family planning services with special references to the types of services that can be undertaken through community-based distribution programmes (available at http://www.ippf.org/en/Resources/Guides-toolkits/IPPF+Medical+and+Service+Delivery+Guidelines.htm).

Stable phase—Health facility activities

Family planning services are best placed within the regular curative and preventive health services available to the population, including other reproductive health services such as maternal health, post-abortion care, and STI/HIV/AIDS testing and services. The integration of services can reduce the potential stigmatisation of individuals, particularly unaccompanied women and adolescents, who may need the services most. Family planning education, which is a critical part of any successful intervention within this area, can be integrated into a number of other indirectly related interventions with excellent results. Field workers should look outside their own programme areas for information, education, and communication opportunities. As always, cultural norms and traditions within this context must be respected[6].

- In addition to the minimum methods (condoms, combined oral contraceptives, progestin-only pills, injectables, emergency contraceptive pills), also make the intra uterine device and implants available to women who want this method;
- Establish a referral system to local/host country family planning services for methods not available on-site;
- Integrate services with maternity, post abortion, emergency contraception and STI services;
- Ensure confidentiality and accessibility for all groups, including unmarried women, adolescents and men.

Adolescents

For many, adolescence is a challenging time for young people in non-emergency situations. In emergencies, where adolescents may be lacking one or both parents and traditional societal structures have been damaged, the transition to adulthood can be even more stressful. At the same time, adolescents often face institutional barriers to accessing the family planning services. Health care providers sometimes have biases that impede youth's access to services. A provider may feel that unmarried youth should not be having sex before marriage, and not provide them family planning as a way to try to get them to stop having sex. Other times providers think that certain methods can cause infertility, or should only be used among women who have already had children, and thus deny young women who have not had children a method. It is especially important that field workers consider the special needs of adolescents for family planning when designing reproductive health programmes. While the specific details will vary somewhat across cultures, the following points can guide staff: [44]

- Proper design of education programmes, which incorporate the views and feedback from the adolescents themselves; peer education programmes have often been found to be useful;
- Many young people are easily reached through schools. Therefore, reproductive health education and counselling for adolescents should be integrated with other education and health promotion programmes in order to reach as many adolescents as possible and avoid stigmatisation of those seeking specific assistance;
- There is need to supplement the traditional sources of information about reproduction, sexuality, and family education;
- Reproductive health information, education, and communication (IEC) efforts should focus not only on reproduction, but also on prevention of STI/HIV disease transmission and building life skills to enable youth to manage situations of risks to STI/HIV infections, unwanted pregnancies, and abortion;
- Adolescents should be made aware of the dangers of sexual violence and know how to seek help in an emergency;
- Dual protection (protection against both pregnancy and STIs, including HIV) should be standard counselling for youth;
- It is important to understand and be sensitive to the refugee population's concerns about adolescents having access to reproductive health services. Confidentiality is crucial and certain emergency situations may demand for it even more. Reproductive health services should be "youth-friendly". Field staff should minimize barriers that may especially affect younger clients such as cost, and ensure that services are private and confidential, offered by staff that have been specifically trained to communicate about family planning with adolescents. Field staff should also ensure that those contraceptive methods preferred by youth contraceptive are readily available. Further information on planning and implementing youth-friendly reproductive health services is available at http://www.engenderhealth.org/ia/foc/focguide.html).

Considering constraints and challenges

Women and couples considering the decision to adopt a family planning method may face a number of barriers that impact their access to services, including:

Economic barriers: Depending on the health services delivery context, some women and couples may need to pay for family planning services. Displaced populations may be especially vulnerable to economic disincentives to accessing contraception. Before starting a family planning programme in a conflict-affected setting, field staff should investigate whether or not it is necessary to charge users for contraceptives and, if so, consult with the community about what is a feasible amount to pay. If field staff are working with a programme that is already established, and that is charging for contraceptives, it is still important to assess whether or not these costs may be preventing more people from accessing services.

Structural barriers: Structural barriers are problems that may exist in the way that family planning services, be it at a health facility or at the community level, are designed, for example:

- Long waiting periods before being attended by health staff;
- Inconvenient hours of service;
- Inadequately informed or experienced health care providers and/or disrespectful health care providers;
- Inappropriate eligibility requirements based on age, marital status, or number of children;
- Lack of privacy;
- Limited choices of contraceptive methods;
- Lack of adolescent-friendly services.

Given adequate resources, field staff are well-placed to identify and address various structural barriers that may exist in on-going family planning programmes or to prevent such problems in future programmes. Problems at this level can be identified through a facilities assessment and by speaking directly with both health care providers and with women and couples who are impacted by the services, either as current users or as potential users.

Informational barriers

- Inadequate and/or inappropriate educational opportunities and materials about family planning at the community level;
- Inadequate and/or inappropriate information provided to individual family planning clients.

Similar to the possible structural barriers, field staff can effectively address informational barriers by first assessing the educational needs of the population with regard to family planning, and by including an information, education, and communication (IEC) component into the family planning programme. Although it is beyond the scope of this chapter to address IEC programmes in-depth, numerous other excellent resources exist to guide field staff in this area. The Johns Hopkins University Center for Communication Programmes has many helpful on-line resources that can be found at www.jhuccp.org.

Cultural and individual barriers

- Incorrect beliefs, and fear, about contraception based on myths and rumours;
- Religious objections to family planning;
- Cultural pressure to have many children;
- Limited autonomy and decision-making authority of women;
- Negative past experiences with family planning.

Field staff should identify incorrect beliefs and fears about contraception and incorporate correct information to dispel myths and rumours into IEC programmes and make every effort to learn about religious and cultural barriers through the needs assessment. It is important that field staff discuss family planning programmes with cultural and religious leaders in the displaced population in order to address any potential problems in advance. In recent years, much progress has been made in the incorporation of men as partners in reproductive health, including family planning. In some settings, this has been shown to reduce the barrier to services arising from women's limited autonomy and decision-making. Activities focus on increasing men's awareness about their own and their partner's reproductive health needs, increasing men's access to reproductive health services, and engaging men in mobilization against gender-based violence. For more ideas on how to address this issue, field staff should refer to the work of MenEngage (www.menengage.org), a coalition of non-governmental organizations involved in research, interventions, and policy initiatives that engage men and boys in reducing gender inequalities and promoting health [6, 66].

Identifying human resources

The number and cadre of staff needed to implement family planning services will depend in part on the type of service delivery programme that has been developed. At the overall level, the programme should be organized and supervised by an experienced nurse, midwife or doctor[37]. When considering the number of health centre staff needed for family planning, field staff should consider the number of health centres to be supported, total population served, level of family planning demand in the community, and types of family planning services to be offered. If a community-based distribution system is to be established, field staff should consider the catchment area for other health outreach services and have the necessary demographic and reproductive health indicator information described above to determine the likely client load and number of community-based distributors needed.

The following table highlights the cadre of staff who can be trained to provide some of the more commonly used types of family planning contraception, as well as emergency contraception. This is meant as a general guideline only and field staff should always consult with the local health authorities about existing national protocols and regulations for the delivery of health services.

Table 4-11: Human resources for family planning services[25]

Type of family planning service	Staff who can be trained to provide this service
Sexual and reproductive health counselling	Doctors, nurses, educators, and community health workers
Condoms	Same as above
Oral contraceptives	Doctors, non-doctor clinic personnel, community health workers.
Injectable contraceptives	Health care providers trained in the education and counselling of clients and the administration of injectables. (Increasingly, community-based distributors and other community health workers have been trained in the administration of injectables).
Implants	Doctors, midwives, and other health professionals trained in counselling and in implant insertion and removal procedures.
IUD	Doctors, midwives, nurses and other health professionals trained in counselling and in IUD insertion and removal procedures.
Emergency contraceptive pills	Doctors, nurses, midwives, other clinical personnel, pharmacists, and community health workers who have been properly trained.

Education/training

The following areas should be included in training plans to ensure the competencies of family planning service providers:

Technical competence
- Description of contraceptive methods (including advantages and effectiveness);
- Mode of action, side-effects, complications, danger signs;
- Appropriate groups of users and instructions for use or administration;
- Contraindications and drug interactions;
- Technical skills relating to the provision of each method (e.g. insertion of IUD or hormonal implant. This requires hands-on training and close supervision);
- Follow-up and re-supply requirements, including ordering supplies;
- Recordkeeping.

Interpersonal skills
- Communication and counselling skills;
- Appropriate attitudes towards users and non-users and respect for their choices.
- Appropriate responses to rumours and misconceptions;
- Respect for dignity, privacy, and confidentiality;
- Understanding of the needs of specific groups, such as adolescents, single women and men.

Communication skills
- Ability to establish open, interactive relationship with the client;
- Encouraging clients to speak and discuss any questions, concerns, and fears;
- Good listening skills;
- Clarifying and summarizing what the client is saying;
- Use of visual or other education materials;
- Identification of clients who may be at risk of STIs and/or other reproductive health related needs;
- Identification of any special needs.

Administrative skills
- Recordkeeping;
- Referrals documentation;
- Inventory control.

Various guidelines and training curricula exist for family planning health care providers. Field staff should consult with local health authorities about what is used locally and what should be complemented from other resources.

Monitoring and evaluation

Field staff should establish clear indicators before implementation of the family planning programme begins. Although the indicators will vary depending on the content of the program, the following are some of the key indicators areas that may be included: [37]
- **Contraceptive prevalence**: the number of women of reproductive age using any method of contraception, divided by the number of women of reproductive age (times 100).

- **Coverage of family planning training**: the number of health workers who provide family planning services and who were trained (or retrained) in the past 2 years to provide family planning services, divided by the number of health workers who provide family planning services (times 100).
- **Community knowledge concerning family planning**: Number of sexually active refugees able to cite major messages about family planning, divided by the number of sexually active refugees targeted for family planning messages (times 100).
- **Contraceptive supply**: Number of service delivery points which maintain a minimum of 3 months' supply of each of the commonly used contraceptives, divided by the number of service delivery points (times 100).

Case study: Family planning for afghan refugees

Family planning is much needed in emergency settings.

- Nearly half (45%) of Afghan refugees in Pakistan reported not wanting any more children. 82% of married Cambodian women in Khao Phlu camp in Thailand wanted to delay or stop childbearing, but only 12% were using a family planning method .

- Among Afghan women who started using a family planning method in the Pakistani camps and surrounding villages, 71% said it was the very first time they had every used family planning. Thus access to contraception was better in the Basic Health Units of their host country than their home country .

Continuation rates in Pakistan among Afghani women were 92% at 3 months, 75% as six months, and then dropped to 43% at 12 months. Nearly half of all women who discontinued did so because of side effects. 40% of users reported receiving no information about side effects from the providers before getting the method . Counselling clients about potential side effects can help reduce anxiety about any side effects, and also helps reduce discontinuation.

Sexually transmitted infections and HIV/AIDS

Sexually transmitted infections (STIs) including HIV/AIDS spread fastest where there is poverty, powerlessness, and social instability. There are a number of other factors associated with populations in crisis situations that may contribute to this serious health problem[10]: First, at every stage of flight, displaced women and girls are vulnerable to rape and sexual abuse. This reality often continues within the camp setting as well. Sexual violence against displaced men and boys, particularly prisoners and captives, is also known to occur. Second, as traditional sources of support and families structures are interrupted and/or destroyed by conflict and displacement, social behaviours may change. In some cases, unaccompanied minors may be more likely to become sexually active at an earlier age than they would under normal circumstances. Displaced people deprived of their normal sources of income may be forced to exchange sex for money or basic survival needs. There may also be social acceptance of high-risk male sexual behaviour that exposes both men and their partners to infection while social norms can limit women's access to information about sexual matters. As well, crisis-affected populations may experience a reduction in health and other services at different points in the crisis. In some cases, services in the area of origin may be in serious decline as part of the emergency that causes displaced populations to flee. Initially, services may not be well-established to address needs at the destination location.

At the same time, however, the risk of a population for STI/HIV/AIDS may also decrease as a result of the displacement if there is a decrease in mobility due to security or others factors that constrict population movement. Crisis-affected populations may also experience reduced accessibility, again reducing interactions between different populations that become cut off from each other. In the longer-term, displaced

populations may have access to better standards of service and more resources in the location of displacement, especially where there may be an increase in international attention and funding.

Ultimately, the impact of these crisis-related changes on increasing or decreasing a population's vulnerability to sexually transmitted infections and HIV/AIDS will depend on factors including:[38]

- HIV prevalence within the affected population pre-crisis;
- HIV prevalence in the surrounding (host) community after displacement;
- Exposure to violence during conflict and displacement;
- Level of interaction between displaced/refugee and host communities;
- Duration of conflict;
- Length of time a displaced population has lived in camp.

The impact of STIs and HIV/AIDS is not just physical: it can also affect the emotional and economic well being of the refugee community. People living with HIV/AIDS and their families may experience social rejection and isolation, increasing the psychological traumas that often accompany refugee life. STIs and HIV/AIDS also leave families vulnerable to poverty and economic dependence, since young adults in their productive working years are most at risk of infection.

HIV/AIDS

HIV (human immunodeficiency virus) is the virus that causes AIDS (Acquired Immune Deficiency Syndrome). HIV is spread between persons in the following ways:

- Sexual intercourse
- Mother-to-child
- Blood transfusion
- Contaminated instruments, needles and gloves

HIV is **not** spread by casual contact such as kissing, shaking hands, or sharing food, clothing, or toilet seats. Nor can it be spread by mosquitoes.

Accurate diagnosis is critical in the fight against both HIV and other STIs. HIV diagnosis is feasible even in resource-limited settings using tests that detect HIV antibodies in the blood. There are two main

Volunteers prepare donated condoms for distribution (Photo: International Federation)

types of HIV antibody tests - the ELISA tests and the simple or rapid tests. Rapid tests have the advantages that they can be done individually, do not require special equipment, and can provide results in 30 minutes or less.

When a person has contracted the virus, he/she has HIV. The virus weakens the person's immune system such that various infections and/or cancers may develop. When this happens to the point that the person has several opportunistic infections, the virus has caused AIDS illness. Many people are not aware that they have contracted HIV until the illness has progressed to full-blown AIDS. The actual signs and symptoms of AIDS vary considerably among patients. However, the common theme is that as the virus destroys the body's immune system, a number of infections and cancers may develop. These infections and cancers ultimately lead to the death of an HIV-infected person. Some of the illnesses associated with HIV/AIDS include tuberculosis, certain skin cancers (e.g.,

Kaposi sarcoma on the skin), certain forms of meningitis (e.g., crypto-coccal meningitis), and pneumonia (pneumocystis carinii pneumonia).

By the time an individual's HIV infection has developed into AIDS, the individual may exhibit major and/or minor signs of HIV, including the following: [12]

Major signs:

- Weight loss of more than 10% body weight
- Diarrhoea for more than 1 month
- Fever for more than 1 month

Minor signs:

- Persistent cough for more than one month
- Generalized itching skin rash
- Recurring shingles (herpes zoster)
- Thrush of mouth and throat
- Chronic severe and spreading cold sores (herpes simplex)
- Generalized enlarged lymph nodes
- Loss of memory
- Loss of intellectual capacity
- Peripheral nerve damage

Although there is no fully effective cure for HIV/AIDS at this time, anti-retroviral medication (ARV) can help to prevent HIV transmission in some cases and can slow AIDS progression and improve the health of those with AIDS. The provision of different types of short-term preventive ARVs, for example as post-exposure prophylaxis (PEP) or in the prevention mother-to-child transmission (PMTCT) may be manageable in the crisis setting. Indeed, the provision of PEP is part of the Sphere standards. However, long-term anti-retroviral therapy may be much more difficult to implement due both to the limitations in drug availability and the challenge of providing long-term treatment in populations that may repatriate and/or be forced to relocate to other areas.

There are many ways in which relief workers can work with local populations to prevent the spread of both STIs and HIV/AIDS in the emergency setting, as described later in this chapter.

Although much attention has been given to HIV/AIDS, it should be emphasised that STIs pose a serious public health threat. Their presence greatly increases the risk of HIV transmission, which in turn increases the risk of active tuberculosis. Women with STIs may suffer chronic pain, infertility, reproductive tract cancer, and complications during pregnancy and childbirth. Their children too may be adversely affected with increased risk of morbidity and mortality.

Sexually transmitted infections (STIs)

STIs are infections caused by various micro-organisms that are transmitted mainly by intimate sexual contact through fluids produced in the human reproductive tract. There are two broad categories of STIs:

Infections caused by bacteria. Common bacterial infections include gonorrhoea, trichomoniasis, chlamydia, syphilis, granuloma inguinale (donovanosis), chancroid, and lymphogranuloma venereum. These infections are usually easily treated with the correct type and course of antibiotics. Left untreated, these infections can cause long-term harm, including infertility, chronic pelvic pain, damage to the central nervous system, infection of the lymph nodes, cardiovascular disease, and even death.

Infections caused by viruses. Common viral infections include human papillomavirus (HPV), genital herpes, hepatitis B and C, genital warts, and HIV. There is no cure for these infections, but some symptoms may be relieved with medications. Clients with these infections often need ongoing support and care from health care providers. Left untreated, viral infections can lead to cervical cancer, liver damage, and even death. One major infection caused by viruses is HIV. HIV is the virus that causes Acquired Immune Deficiency Syndrome (AIDS). HIV slowly damages the body's immune system, reducing its ability to fight other diseases. People living with HIV—after years of infection without any signs or symptoms—develop AIDS. When they have AIDS, they may get sick more easily with certain illnesses (skin rashes, chronic diarrhoea, wasting, pneumonia, oral thrush, or tuberculosis). Without treatment, most people with AIDS will eventually die from illnesses their bodies can no longer fight.

Transmission

The bacteria and viruses that cause STIs, including HIV, are carried in body fluids including semen, vaginal fluid, mucus membrane secretions (fluids released from the skin that lines the anus, vagina, mouth), and blood. Infections are spread by actions that transfer body fluids, such as:

- Vaginal intercourse;
- Anal intercourse (with a man or a woman);
- Oral intercourse (risk is with the person using their mouth);
- Other sexual activities that allow body fluids to enter the mouth, anus, or vagina or to touch an open cut or sore;
- Skin-to-skin contact of the genitals (spreads human papilloma virus (HPV), herpes and primary syphilis).

Infections in the blood (Hepatitis B, Hepatitis C, and HIV) are also spread by sharing needles with an infected person (for example, among injecting drug users), transfusions of infected blood or blood products, tattooing, body piercing, or being cut with needles, razors, or other sharp objects that are contaminated with HIV, or infected blood touching an open cut or sore. HIV and some STIs also can be passed by pregnancy, childbirth, or breastfeeding

 All members of a community are not at equal risk for acquiring and transmitting STIs. Relatively small groups of individuals, who have high rates of partner change, increase the rate of spread of STIs. These groups are termed "core groups." "Bridging groups" are the members of which have sex both with core groups and the general population, thus spreading infections into the general population.

Diagnosis

For STIs other than HIV, the preferred method of diagnosis is also laboratory testing. However, this is rarely feasible in resource-limited settings. Although less precise, diagnosis of STIs based on symptoms is currently the only option in reproductive health care services for many crisis-affected populations where laboratory testing is not

available. Field workers implementing STI diagnosis and treatment activities should refer to the World Health Organization's Training Modules for the Syndromic Management of Sexually Transmitted Infections (http://www.who.int/reproductive-health/stis/training.htm). The signs and symptoms of common STIs are summarised in the next table. While this table lists symptoms of STI's is not meant to be used for syndromic diagnosis of STIs.

Table 4-12: Symptoms of STIs

Infection	Signs and symptoms
Gonorrhoea	Common STI caused by bacteria, characterised by a pus-like discharge from urethra or cervix, and painful urination in both men and women. Women often have no symptoms of infection. Can lead to infertility in both sexes.
Chlamydia	Caused by a micro-organism which can produce inflammation of the vagina/cervix or urethra; can also lead to pelvic inflammatory disease in women. Characterised by a thin mucous discharge in men, and cervical discharge in women (can be yellow or green in colour). Women often have no symptoms of infection.
Syphilis	Caused by a spirochete which produces a genital ulcer in the early stages (usually painless), and a more general non-itchy skin rash in a secondary stage. If not treated, can also affect the heart and brain in late stages.
Chancroid	Most common cause of genital ulcer disease in many parts of the developing world; involves painful, soft sores on the genitals which discharge pus; sometimes causes enlarged lymph nodes in the groin.
Trichomoniasis	Caused by a parasite that produces effects ranging from no symptoms to irritation, itching, odour, vaginal discharge, and/or frequent urination in women. While males rarely display symptoms, they may develop inflammation of the urethra and/or skin lesions on the penis.
Genital Herpes	Caused by a virus producing multiple, shallow ulcers anywhere on the genitalia; lesions usually heal and recur in cycles. Viral shedding can occur during latent periods. There is no known cure.
Humanpapilloma Virus (HPV)	A common virus causing small, painless primary lesions in the area of infection, usually referred to as genital warts. Research indicates a probable link between HPV exposure and later development of cervical cancer.

Key facts about STI's

- STIs cause the second highest burden of disease for women aged 15-44 in developing countries, after maternal mortality and morbidity.

- STIs facilitate the transmission of HIV, and the early diagnosis and effective treatment of STIs can reduce HIV infection incidence.

- Biological and social factors make women and girls more vulnerable to HIV/AIDS than men, especially in adolescence and youth, when in many places HIV infection in young women has been found to be 3-5 times higher than among boys.[4]

- In Africa, women's peak infection rates occur at earlier ages than men's. This helps explain why there are an estimated 14 women living with HIV for every 10 men in this region. [40]

- In Africa, AIDS now kills ten times more people a year than war.[41]

Prevention and management of STIs and HIV/AIDS

In the immediate response to a crisis, field staff should concentrate on implementing a response outlined by the Sphere guidelines (see below), which does not require a specific assessment exercise. However, The Inter-Agency Standing Committee Task Force on HIV/AIDS in Emergency Settings also provides guidelines for the collection of baseline data related to HIV/AIDS that can be undertaken even in the minimum response phase of an on-going emergency. Collecting such information as soon as feasible, in order to plan for broader set of STI/HIV/AIDS-related activities also falls within the MISP component of planning for comprehensive reproductive health services.

Field staff should conduct a situation analysis that includes the following: [10,37 31]

- STI and HIV prevalence levels for both the country/region of origin (if populations have been displaced to new areas) and hosting communities, including the prevalence of specific types of STIs common to the population;

- Identification of specific high-risk locations within the affected communities (e.g. locales for commercial sex work, high-alcohol consumption spots, etc.) which could be targeted for special prevention interventions;

- Information about the cultural and religious beliefs, knowledge, and practices related to sex and the transmission of STI/HIV/AIDS;

- The level and types of sexual interactions and sexually-related behaviours;

- Identification of resource persons within the affected populations (e.g. people who have already been trained on the prevention and management of STI/HIV/AIDS);

- The level, quality, and accessibility of local services for the prevention and treatment of STI/HIV/AIDS (including voluntary confidential counselling and testing for HIV, availability of STI diagnosis and treatment, measures for the prevention of mother-to-child transmission of HIV, accessibility of anti-retroviral treatment, adherence to universal precautions, blood screening, and other services);

- Relevant national and/or local protocols on STI/HIV/AIDS prevention and treatment services, for both the communities of origin and hosting communities;

- Background information on demographic and education indicators;

Field staff should also consider: [65]

- Local decision-making structures and processes, networks, interest groups, and socio-economic groupings;

- Gender roles and relations, and the impact of displacement on these;

- The overall health status of the affected communities;

- Local health service practices regarding the management of blood safety and infection control;

- Knowledge, attitudes, and practice in relation to injecting drug use;

- Knowledge, beliefs, and practice in relation to pregnancy, childbirth, and infant feeding;

- Barriers to effective care and support for people living with HIV;

- Laws that relate to HIV and other STIs.

Field staff can use a variety of information collection methods and tools depending on the type of information needed and the level of available resources including time, budget, and personnel. Some of the background information should be available through local health authorities and/or national reports on STI/HIV/AIDS (see for example the HIV/AIDS survey indicators database (http://www.measuredhs.com/hivdata).

For the assessment of local health services related to STI/HIV/AIDS, as well as community practices, field staff can refer to the RHRC Reproductive Health Needs Assessment Field Tools (available at www.rhrc.org).

Beyond the situation analysis, where time, financial, and personnel resources are sufficient, field staff may consider undertaking a survey to assess community knowledge and practices related to STI/HIV/AIDS. The CDC provides guidance on survey methods and a questionnaire that covers STIs (section 6) and HIV/AIDS (section 7) in its Reproductive Health Assessment Toolkit for Conflict-Affected Women (http://www.cdc.gov/reproductivehealth/Refugee/RefugeesProjects.htm), and UNHCR has undertaken HIV behavioural surveillance studies to which offer further ideas about the assessment of community HIV-related knowledge and behaviours through survey methods.

Distribution of condoms

Field staff should develop a plan to address the prevention and management of STI/HIV/AIDS depending on the most pressing needs identified through the assessment. One possible option is the distribution of condoms. The consistent and correct use of condoms is known to prevent the transmission of HIV. Condom distribution should be included in plans at all stages of the emergency and, as highlighted in the Inter-agency Field Manual Reproductive Health in Refugee Situations, should include the following:

- Condoms and instructions for their use should be available on request in health facilities (especially where STIs are treated) and distribution centres. Staff should be trained in the promotion, distribution and use of condoms;

- Promotional campaigns should be launched at sports events, mass rallies, dance and theatre venues, group discussions, and other locally-appropriate meeting points to promote the use of condoms and provide information on where and how to obtain them;

- Liaise with local health authorities and groups involved in HIV prevention in the populations surrounding the camp to coordinate condom distribution in those areas;

- Start partial cost-recovery of condoms through social marketing if and when feasible and appropriate, for example through shops, bars, and community distribution agents.

While the above points are oriented primarily to ensuring wide access of condoms to the crisis-affected population, field workers should also ensure that condoms are readily available to humanitarian workers.

A three month supply of condoms for 10,000 persons is included in Sub-kit 1 of the Interagency Reproductive Health Kit for Emergency Situations. If this is not available, or if planning for subsequent supplies, the number of condoms needed per month can be calculated if it is possible to estimate:

- The size of the sexually active male population (roughly 20% of the target population);

- The percentage of males using condoms (based on results of assessments if done, or any other reliable estimate).

To calculate, multiply the estimated number of sexually active males in the target population by the percentage of males using condoms. Multiply this by 12 (estimate of the number of condoms needed per person per month). Add to this 20% for wastage/loss.[37.]

4

Reproductive health care

Adherence to the universal precautions

Universal precautions are a set of measures undertaken at the health facility level to prevent the transmission of HIV (and other illnesses transmitted via blood or body fluids) among patients and health care workers. These measures include[64]:

- Frequent hand washing;

- Use of gloves and protective clothing (e.g. waterproof gowns or aprons), masks and/or eye shields as necessary for all procedures involving contact with blood or other potentially infected body fluids;

- Use of new, disposable injection equipment;

- Adequate incineration and sterilization facilities, and proper disposal of medical waste;

- Use of appropriate techniques for the disinfection and sterilization of medical equipment;

- Treatment of work injuries through washing of wounds, rinsing of eye or mouth splashes and PEP as appropriate;

- The safe handling of sharp objects, including the use of puncture-resistant containers for used needle disposal;

- Proper handling of contaminated waste, including human waste and corpses.

Blood transfusion safety

The transmission of HIV through the infusion of infected blood is close to 100%. It is crucial in emergency settings, as under any circumstance, that blood transfusion is undertaken under the highest safety standards. There are several measures that field staff can take to ensure safe blood transfusion, including[64]:

- Reduce the need for blood transfusion by training health care to use volume replacement solutions where possible;

- Avoid blood transfusion as much as possible at night, when there is often insufficient light;

- When blood transfusions are implemented at camp level, develop proper systems and bold appropriate medical staff accountable for the transfusions;

- Blood transfusions should ideally be done in health facilities where laboratory facilities exist to screen donors for HIV and other infectious diseases, to cross-match blood and to manage complications due to blood transfusions;

- All health workers should be trained to ensure that blood transfused in their facility and/or the blood supply in the facility to which they refer patients is safe;

- Select safe donors;

- Ensure that all blood for transfusion is safe through screening for HIV and other blood-borne diseases;

- Ensure that blood banks have sufficient supplies for screening blood;

- Provide sufficient HIV and other tests and supplies for screening blood where needed.

Post-exposure Prophylaxis (PEP)

Post-exposure prophylaxis against HIV infection is the immediate use of antiretroviral drugs after exposure to potentially infectious blood or other body fluid. It is effective when used more immediately after the exposure, but is not 100% effective. According to the WHO, dual or triple drug therapy is recommended for PEP. The following drug dosage guideline depends on drugs previously taken by the source patient and known or possible cross resistance to different drugs. Where there is no known resistance to zidovudine or lamivudine in the source patient[58]

- Zidovudine (ZVD) 250-300 mg. twice a day

- Lamivudine 150 mg. twice a day

And, if there is to be a third drug:

- Indinavir 800 mg. 3 times a day or Efavirenz 600 mg. once daily (not recommended for use in pregnant women).

Information, Education, and Communication (IEC)

IEC activities are important in all reproductive health activities and have been a cornerstone in the fight against HIV/AIDS. Appropriately designed and targeted communications aimed at informing and educating populations about their health can lead to changes in beliefs and behaviours that underlie many health problems. Field staff should develop an IEC strategy that focuses on the population's largest information gaps as determined through needs assessment. They should also target one sub-group within the population, such as teens, or young mothers. The strategy should be well-planned with a specific goal and behaviour-related objectives that will contribute to the goal and that can be measured in evaluation. IEC messages should be short, accurate, and relevant, and accessible to the population in local languages and with the appropriate level of vocabulary. The messages should be delivered via the most effective medium for the population, be it radio, television/video, community drama, music or print (e.g. posters, pamphlets, etc.). Before launching a specific large-scale IEC campaign, it is important to field-test both the messages (i.e. does the target audience interpret the message as intended) and the communication method chosen. Examples of key HIV/AIDS-related messages that can conveyed to a population via IEC activities include: [37]

- How to use condoms and how to dispose of them safely

- How HIV is and is not transmitted

- Means of prevention

- Common signs and symptoms

- Where to receive counselling

- Where to receive treatment

- Where to go for support services

- Why it is important to inform and involve all sexual partners

- Safe sex practices

- Importance of early treatment

There exist many excellent resources to guide the development of HIV/AIDS IEC programmes. For examples on the Internet see www.jhuccp.org

Voluntary confidential counselling and testing (VCCT)

VCCT is both a prevention measure and the first step in HIV management. VCCT can help stop the spread of HIV if HIV-positive persons are informed of their status and adequately counselled to take the necessary steps to avoid the infection of others. VCCT services should include: [37]

- Assessment of the availability of testing in the country of origin and host country
- Informed consent
- Pre-test counselling
- Post-test counselling
- Confidentiality
- A strategy to confirm positive tests with more specific tests
- A strategy and activities to promote VCCT

Numerous options for implementing VCCT services have been developed over time including:

- Stand-alone or free-standing models
- Integrated models
- Mobile or outreach models
- NGO models
- Public sector/NGO partnership models
- Private sector models

The type of model most appropriate for a specific setting will depend on a variety of factors including the availability of other health services in which to integrate VCCT, the location of populations (i.e. populations that are dispersed over a large area and/or located in insecure areas may be best served by mobile/outreach services), and the extent to which it is possible to collaborate with other organizations. Field staff should also consult with local health authorities about VCCT protocol and service delivery models in place at the location of the crisis-affected population. Numerous detailed resources exist to guide field staff in the establishment of quality VCCT services, including Family Health International's VCT Toolkit, which includes specific, detailed information in its *Guide to Establishing Voluntary Counselling and Testing Services for HIV*, and training materials for VCCT counsellors and supervisors.

Treatment and management of STIs

Because laboratory testing is not always possible in emergency settings, a syndromic approach to STI treatment and prevention should be adopted. Technical details about the treatment of specific STIs can be obtained in standard medical textbooks. The success of STI care in a population depends on consistent availability of drugs.

After diagnosing based on observed syndromes, effective treatment for STIs should be initiated as quickly as possible. Patients should be encouraged to comply and complete the complete course of STI treatment needed. If possible, the tracing of partners of patients with STIs should be encouraged so that they can be treated as well.

Examples from the field: HIV

- In Rwanda revealed 17% of women who had been raped tested HIV-positive, compared with 11% of women who had not been raped. In some conflicts, young men and boys have also been targets of rape .

- HIV prevalence in refugee camps in Kenya and Tanzania ranged from 2% to 10%.

- Only 5% of internally displaced persons in Burundi knew that condoms provide protection from HIV; only about 20% have ever used a condom. 20% thought that HIV can be transmitted through kissing or eating with an infected person .

- When the Angolan conflict ended in April 2002, the country had substantially lower HIV prevalence (5–10% in Luanda and 1–3% in rural areas) than other countries in Southern Africa. HIV prevalence among returning refugees was much lower than the surrounding host populations' prevalence in Namibia and Zambia. Strong HIV-prevention programmes in refugee camps meant that returning refugees actually had better HIV knowledge than the average Angolan. The prevention skills and messages disseminated in refugee camps may actually help the returning refugees to become an important HIV-prevention resource for Angola .

Special arrangements may be made to ensure women and young people have access to STI treatment. If left untreated, STIs can lead to serious consequences including sterility (gonorrhoea), serious debilitation and complications in foetal development (syphilis). Scientific evidence shows that frequent STI infections also facilitate the transmission of HIV, more specifically through the presence of open sores in the genital area. Effective prevention and management of STIs can therefore serve the dual purpose of reducing and preventing the transmission of HIV infection, although it is by no means a sufficient HIV prevention measure in and of itself.

*Photo: International
Federation*

Examples from the field: STI's

- Nearly 45% of women attending an antenatal care clinic in Rwandan refugee camps in Tanzania had a vaginal infection that was not sexually transmitted. 31% had trichomonas vaginalis, 4% had syphilis, and only 3% had gonorrhea.

- Among male Rwandan refugees in Tanzania, 10% of men had urethritis, with one-third of those infections being gonorrhea, chlamydia, or both. 6 % had syphilis {UNAIDS, 2003 #92.

Treatment and management of HIV/AIDS

The MISP includes three primary strategies to reduce the transmission of HIV/AIDS:

- Ensure safe blood transfusions;
- Enforce respect for universal precautions;
- Guarantee the availability of free condoms.

Once it is possible to expand services for a complete comprehensive program, then programmes should include:

- Tailored service provision according to data obtained through baseline assessments and, where possible, behavioural and biological surveys;

- Provision of individual education programmes and counselling;
- Provision of condoms and education on their use;
- Assistance with partner notification;
- Clinic-based IEC strategies;
- Community-based education and support programmes for AIDS patients;
- Syndromic management of STIs using local or WHO flowcharts available to all staff;
- A checklist to guide comprehensive case management, monitoring and supervision;
- Availability of appropriate drugs.

HIV testing

In an emergency, HIV testing must be available, and in some cases devoted, first and foremost, to ensuring a safe blood supply for transfusions. A voluntary HIV testing and counselling (VCT) programme is a lower priority in a refugee situation but should not be ruled out if resources are available and if these services are available in the host country or were available in the country of origin. VCT is best considered when a national policy is already in place supporting its use. In these cases existing resources and programmes that coordinate with the national policy should be used. HIV testing must be voluntary and confidential. Ideally VCT services would be offered in locations where programmes can continue over the long term and where essential HIV/AIDS services and programmes are already in place.

HIV care and treatment, post-emergency phase

People known to be HIV infected or to have AIDS should remain within their communities or within the refugee settlements, where they should have equal access to all available care and support[45]. Needs assessments should be conducted to determine if prevention or care and treatment of opportunistic infections including tuberculosis is needed.

Based on needs assessment, develop strategies for IEC (including anti-discrimination for persons living with AIDS), condom promotion, VCT, PMTCT, treating with anti-retroviral (ARVs) therapies, and care for children and orphans affected by HIV/AIDS. Care should be available through clinic visits and also home-based care. Home-based care includes wound care, hygiene and diet support, psychosocial care and support for families, pain management, assisting people to get to clinics for visits, and essential drugs for home-based care. Home-based care and counselling can be provided by trained AIDS community educators or health information teams.

Adolescents

Adolescents should be included in HIV prevention activities. Adolescents can identify what makes them vulnerable and create strategies to address these risks. To run an effective youth program, tap into networks that adolescents belong to: integrate HIV/AIDS materials into health and nutrition programmes, or existing sports events in the community. Many programmes use peer educators to reach youth through music, dance, drama, sports competitions, home visits, group discussions, income generation activations or HIV/AIDS club.

In many parts of the world, it will be important to develop two sex education programmes, one for boys and one for girls. It may also be helpful for mothers of girls or fathers of boys to be involved so they can understand why their child is learning to protect themselves from HIV. Including parents will provide an opportunity to help parents teach their children about life skills.

Identifying human resources

The prevention and management of STI/HIV/AIDS will require different human resources depending on the type of services to be offered. Field staff designing and managing IEC activities should ideally be trained in communication skills and have the relevant background and experience to ensure messages and information provided are technically accurate and up-to-date. As well, many IEC activities may rely on volunteers or community members, including youth (e.g. adolescent peer education programmes), community leaders, community-based health personnel, etc. to promote messages. Field staff or volunteers administering treatment or care should have medical experience and be well trained for the situation before assisting those with STI/HIV/AIDS. It is important that all individuals recruited be properly trained about STI/HIV/AIDS so that staff and volunteers do not contribute to the rumours that sometimes are associated with these issues.

Gender-based violence

Gender-based violence (GBV) against women, including sexual violence, is increasingly documented in emergencies – particularly those associated with armed conflict -but also in disaster and post-emergency settings. Sexual violence is perhaps the most serious form of gender-based violence in these settings and will be the focus of this chapter.

During conflicts, sexual violence happens in a number of settings and can have specific characteristics that are different than sexual violence during times of relative peace. Women and children may submit to abuse at the hands of humanitarian workers and other gatekeepers in order to gain access to basic commodities necessary for survival such as food and shelter. Rape has also been used as a weapon of war, as a way of terrorizing and tearing apart communities, and as a component of ethnic cleansing drives. In some cases, women and girls have been abducted by armed groups and made into sex slaves or "wives" for the combatants.

Violence against women in emergency and displaced settings, however, does not happen in a vacuum. It often reflects women's subordinate status and the discrimination and abuse that they face in times of relative calm and stability. Violence against women by their intimate partners (also referred to as domestic violence) has been documented in refugee and internally displaced camps and should be recognized by aid workers as an important and prevalent form of gender based violence in emergencies as well as post-emergency and displacement.

It is important to note that under-reporting of sexual violence is an issue even in relatively peaceful settings and where services are available. Women may not report this violence because of self-blame, shame, fear of stigma or social exclusion, fear of being blamed by others for the attack, or fear of reprisal. It should therefore be assumed that any existing data on prevalence of sexual violence or other forms of gender-based violence is an under-estimate.

This serious violation of rights, which affects primarily women and children, has significant effects on the physical and mental health of victims, their families and communities. During times of conflict and displacement, the typically already inadequate response of the health sector to sexual violence is often compounded by disruption of services and lack of access to even the most basic level of care.

Responses to sexual violence in emergency settings have been inconsistent, insufficient and often based on the interests of individual aid workers, especially in the health sector. In emergencies, even a minimum level of post-rape services is rarely available through the health sector. This may be related in part to societal and personal attitudes, lack of training and knowledge, political considerations and funding limitations. An appropriate response should integrate a range of physical and mental health services along with social and legal assistance in order to mitigate the harmful effects of violence and minimize the likelihood of further trauma.

Response to gender based and sexual violence is part of the Minimum Initial Service Package (MISP) which should be implemented in emergencies. The MISP is the minimum standard for reproductive health in emergencies and was developed by the Inter-Agency Working Group (IAWG) on Reproductive Health in Refugee Situations. This standard is endorsed in subsequent international humanitarian guidance documents including the Sphere standards and the Inter- Agency Standing Committee (IASC) Guidelines for Gender-based Violence Interventions in Humanitarian Settings.

Recently, there has been additional emphasis on the need to prevent sexual and other forms of gender-based violence through the design and implementation of humanitarian response. While less is known about prevention than response, some good practices have been identified including:

- Dissemination and enforcement of codes of conduct for humanitarian staff;
- Careful recruitment, vetting, hiring, and monitoring of staff;
- Monitoring and evaluation of situation to understand the nature of gender-based violence in the context;
- Careful design of camps, proper lighting and location of water points and latrines;
- Planning and implementation of programmes based on consultation with and participation of women;
- Promoting legislation and justice to strengthen accountability, including by providing legal counselling and supporting survivors' access to justice;
- Providing training programmes for security forces, peacekeepers, police, and other arms bearers on the prohibition of sexual violence in international law.

Gender-based violence is a cross-cutting issue that requires coordinated action by all sectors. Each and every sector has a role to play for preventing and responding to gender-based violence. In addition to action by all sectors, the affected communities also have a key role to play in preventing and responding to gender-based violence.

Definition of sexual violence

The WHO World Report on Violence and Health defines sexual violence as "any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic a person's sexuality, using coercion, threats of harm or physical force, by any person regardless of relationship to the victim, in any setting, including but not limited to home and work"[59]. Forms of sexual violence include "physically forced or otherwise coerced sex, attempts at coerced sex, assault with a sexual organ, sexual harassment, including sexual humiliation, forced marriage or cohabitation, including marriage of children, forced prostitution and trafficking in women, forced abortion, denial of the right to use contraception or protect self from disease, and acts of violence against women's sexuality such as female genital mutilation and social virginity inspections".

The Inter-Agency Field Manual on Reproductive Health in Emergencies offers the following as a working definition of "sexual violence": Rape, the most often cited form of sexual violence, is defined in many societies as sexual intercourse with another person without his/ her consent. Rape is committed when the victim's resistance is overwhelmed by force or fear or other coercive means. However, the term sexual and gender-based violence encompasses a wide variety of abuses that includes sexual threats, exploitation, humiliation, assaults, molestation, domestic violence, incest, involuntary prostitution (sexual bartering), torture, insertion of objects into genital openings and attempted rape. Female genital mutilation and other harmful traditional practices (including early marriage, which substantially increases maternal morbidity and mortality) are forms of sexual and gender-based violence against women which cannot be overlooked nor justified on the grounds of tradition, culture or social conformity".

The definition of "sexual violence" according to the International Criminal Court is: "(t)he perpetrator committed an act of a sexual nature against one or more persons or caused such person or persons to engage in an act of a sexual nature by force, or by threat of force or coercion, such as that caused by fear of violence, duress, detention, psychological oppression or abuse of power, against such person or persons or another person, or by taking advantage of a coercive environment or such person's or persons' incapacity to give genuine consent".

The United States Centers for Disease Control and Prevention presents the following definition: "sexual violence is a sex act completed or attempted against a victim's will or when a victim is unable to consent due to age, illness, disability, or the influence of alcohol or other drugs. It may involve actual or threatened physical force, use of guns or other weapons, coercion, intimidation, or pressure. Sexual violence also includes intentional touching of the genitals, anus, groin, or breast against a victim's will or when a victim is unable to consent; and voyeurism, exposure to exhibitionism, or undesired exposure to pornography. The perpetrator of sexual violence may be a stranger, friend, family member, or intimate partner".

Key facts about gender-based violence

▪ It is estimated that one of every three women in the world has been physically or sexually abused during her lifetime.

▪ While more research is needed, existing data suggest that in some contexts almost 25% of women may experience sexual violence by an intimate partner (such as a husband or boyfriend) and up to one in three adolescent girls reported that their first sexual experience was forced.

▪ 50,000-64,000 of nearly 650,000 internally displaced women in Sierra Leone may have experienced sexual violence at the hands of armed combatants.

▪ It is believed that the majority of Tutsi women caught up in Rwanda's 1994 genocide experienced some form of gender-based violence. Some estimate that as many as 250,000 to 500,000 survived rape.

▪ Estimates of rape during the war in Bosnia and Herzegovina suggest that between 20,000 and 50,000 women experienced rape.

Even when no reliable measurement of prevalence exists, humanitarians should act on the assumption that gender-based violence exists and that it is a serious issue for their attention. Additional information on gender-based violence can be found in the reports of human rights groups.

Health risks of gender-based and sexual violence

Survivors of sexual violence are at risk for a range of physical, psychological and social consequences:

▪ **Physical consequences:** These may include sexually transmitted infections (including HIV), unintended pregnancies, unsafe abortions, menstrual disorders, trauma to the reproductive tract, and other injuries;

▪ **Psychological effects**: These may be considerable, such as post-traumatic stress disorder, depression, suicidal ideation (thoughts of suicide) and suicide attempts;

▪ **Social consequences**: Women who experience sexual violence are often stigmatised and/or rejected by their husbands, family, and community.

Reproductive health care

Table 4-13: Consequences of gender-based violence

Physical consequences of gender-based violence	Psychological consequences of gender-based violence
▪ Unwanted pregnancy ▪ Unsafe abortion ▪ Sexually Transmitted Infections (including HIV) ▪ Sexual dysfunction ▪ Infertility ▪ Pelvic pain ▪ Pelvic inflammatory disease ▪ Urinary tract infections ▪ Genital injuries ▪ Fistulas ▪ Bruises and lacerations	▪ Post Traumatic Stress Disorder (PTSD) ▪ Depression ▪ Social phobias ▪ Anxiety ▪ Increased substance use and abuse ▪ Suicidal behaviour ▪ Sleep disturbances ▪ Eating disorders ▪ Sexual difficulties

Key tools for health sector response to gender-based violence in emergencies

Of the tools that are available to provide practical information on response to gender-based violence in emergencies, two are of particular importance to the health sector.

The first is the 2005 revised edition of the WHO/UNHCR document on Clinical Management of Rape Survivors. This guide, developed together with the International Committee of the Red Cross and UNFPA, provides specific guidance on clinical management of rape survivors, including performing a physical examination, collecting and documenting evidence and providing care. While the guide focuses on clinical management of women, it also identifies specific considerations relating to caring for children, men, pregnant women and the elderly. It also includes sample forms and protocols for emergency contraception, post-exposure prophylaxis, and prevention and treatment of STIs. The guide is available on the WHO website.

Gender-based violence is a cross-cutting issue that requires attention and action by all sectors providing assistance in emergencies. Recognizing this, the Inter-Agency Standing Committee Task Force on Gender and Humanitarian Assistance developed guidelines for gender-based violence interventions in humanitarian settings (Gender-based violence guidelines). They are designed for use by all humanitarian actors and are organized by sector with chapters on cross-cutting issues that affect all sectors. The primary purpose of these gender-based violence guidelines is to enable humanitarian actors to plan, establish, and coordinate minimum services to prevent and respond to gender-based violence (particularly sexual violence) in the early phase of any emergency setting. The guidelines are available on the IASC website.

Photo: International Federation

Importance of a coordinated response to gender-based violence in emergencies

The gender-based violence guidelines highlight the importance of proper coordination of gender-based violence -related activities between and within sectors. This is essential in order to protect women, prevent sexual violence, and to avoid wasteful duplication or gaps in service provision. One possible mechanism for such coordination is the gender-based violence working group. These groups have been set up in many emergencies as a way for all actors (UN, NGOs, and local partners) to meet regularly, discuss issues, provide updates and coordinate prevention and response activities. Ideally, such groups should exist at both the national and regional levels. They could be used to identify a lead agency for GBV, share information about resources and data on gender-based violence incidents, discuss problems, plan solutions, and jointly monitor and evaluate activities.

Planning gender-based violence programmes in the health sector

Within the health sector, sexual violence responses and programmes should be an integrated part of health planning. As described in the *epidemiology chapter* of this section, all programmes should start with an assessment of needs. Assessments should be coordinated with other sectors (for example, security) to avoid overlapping activities and should involve members of the community. If a gender-based violence programme is being done, then the items listed in Table 4-14 should be included in the assessment.

Table 4-14: Gender-based violence assessment checklist

Health factors	Social factors
Demographic profile and health status ▪ Total population ▪ Number of women ▪ Number of male children 0-18 years old ▪ Number of female children 0-18 years old ▪ Number of female-headed households **Available services and resources** ▪ Organizations that are currently providing health and/or psychosocial services for survivors of gender-based violence ▪ Multi-sector mechanisms for prevention and response to gender-based violence ▪ Gender-based violence services are offered ▪ Organizations offering these services ▪ Extent and condition of existing health facilities ▪ Protocols for caring for survivors ▪ Staffing, coverage and breakdown of staff by sex and role (include TBAs) ▪ Inventories of equipment, drugs and commodities ▪ Location of relevant services such as VCT for HIV ▪ Health provider attitudes regarding gender-based violence **Overview of gender-based violence, including sexual violence** ▪ Data about prevalence/incidence ▪ Identification of high risk populations	**Details of population movement** **Community knowledge, attitudes, and practices** ▪ Understanding cultural norms and the effect of dislocation on: ▪ Rites of passage ▪ Status of women ▪ Knowledge of AIDS and STIs ▪ Gender-based violence /Sexual violence ▪ Opinions about security **Community leaders' attitudes/statements regarding gender-based violence** **Justice issues** ▪ National laws relating to gender-based violence including legal definitions, mandatory reporting, police evidence requirement procedures, judicial system ▪ Laws relating to emergency contraception and abortion ▪ Customary laws relating to gender-based violence ▪ Community mechanisms for traditional justice *For all of these items:* 1) Special attention should be paid to differences between ethnic/religious groups, should there be more than one group present. 2) It is very important to learn and use the local words for key terms and concepts.

In addition to the basic information listed above, referral systems and legal information should be obtained when setting up services to address gender-based violence. Referral systems are key to providing care for victims of gender-based violence. It is essential to identify mechanisms for referral and to ensure that all humanitarian actors are aware of them. Survivors may need referral to health, psychological, and social services, security, and legal assistance.

When working with children, it is important to find out the laws regarding mandatory reporting of child abuse as well as laws regarding who may consent on behalf of a minor. Information about local laws on abortion and emergency contraception should also be obtained. The Ministry of Health may be a source of this information, as well as information about training for health professionals, national STI protocols and other guidelines (for example, forensic evidence collection procedures in rape cases and PEP).

Collection of forensic evidence in sexual violence cases can involve invasive procedures that may further traumatize a victim. Before agreeing on what evidence will be collected in sexual violence cases, it is essential to have accurate information about local capacity for storing and testing forensic samples, standards for evidence, crime reporting requirements, and who can give testimony on forensic matters. This information may be available through ministries of justice. Efforts should also be made to obtain copies of police records and other forms which may be necessary. In some cases, evidence gathering may endanger the victim, the healthcare provider or family due to the political issues in country (Darfur is an example) and should only be collected if there is/are mechanisms in the future that may afford justice to the victim. Treatment of the victim in these cases is the priority.

All information gathering and documentation activities on sexual violence in emergencies should be informed by the WHO Ethical and Safety Recommendations for Researching, Documenting, and Monitoring Sexual Violence in Emergencies.

Developing a detailed plan of action

A detailed plan of action helps managers outline exactly how the goals and objectives will be achieved by specifying *what* the activities are, *how* they will be done, *when* and *by whom*. An overall plan of action can be drafted which reflects coordination and division of roles **between** actors. This can serve as a basis for periodic review through the coordination mechanism, such as the gender-based violence taskforce. A more specific plan for actors within the health sector can be used to coordinate gender-based violence activities with other health services, such as reproductive health.

Indicators should be identified in the planning phase and should be related to specific activities. Each activity should relate to an overall goal and objective of the project. It is helpful to identify expected **inputs**, **processes**, and **outcomes** (mainly output and effect since impact is difficult to measure). When evaluating the programme activities, these indicators should be used as measures of progress towards the overall goal(s) of the intervention. Table 4-15 shows some sample indicators.

Photo: International Federation

Table 4-15: Sample worksheet of indicators for a community gender-based violence programme

Goal	Objective	Input	Process	Output	Effect	Impact
Decrease incidence of sexual violence	Provide health and community services to gender-based violence survivors	Health care providers Training materials Trainers	Training Skills testing	Percent of health care providers trained in gender-based violence care and treatment	Identification and timely treatment of gender-based violence victims Competence in carrying out gender-based violence health care, counselling, and referral	Integration of gender-based violence medical management programmes into existing heath system structures Increased reporting of gender-based violence Decreased incidence of gender-based violence in the community
	Provide information, education and communication to the community	Community leaders Training materials Trainers	Training Skills testing	Percent of community members (women, youth and men) involved in information dissemination	Community awareness of the availability of sexual violence services	Timely presentation/ reporting of sexual violence victims Decreased incidence of gender-based violence in the community
	Assessment and monitoring	Healthcare providers, data collectors Training materials Trainers Contextualized survey	Training Skills testing Survey	Coordinated rapid survey assessment of situation	Understanding of local incidence of gender-based violence, gaps in services, needs and community involvement	Improved health care services based on needs assessment of the situation Decreased incidence of gender-based violence in the community

For more information, please see section on monitoring and evaluation.

A basic checklist for the clinical management of sexual violence should include the following:

Protocol

- Written medical protocol in language of the provider

Personnel

- Trained (local) health care provider (on call 24 hours/day)
- Female health care provider that speaks language of survivors is optimal

Setting

- Quiet, private, accessible room with access to a toilet or latrine
- Examination table
- Light
- Magnifying glass
- Access to autoclave
- Access to laboratory facilities with trained technician
- Weighing scales and height chart for children

Supplies

- "Rape Kit" (See WHO/UNHCR guidelines for contents)
- Supplies for Universal Precautions
- Resuscitation equipment
- Sterile medical instruments and suture material for repair of tears
- Needles, syringes
- Cover for examination
- Spare clothing to replace those torn or taken away
- Sanitary supplies
- Pregnancy tests
- Pregnancy calculator disk to determine the age of pregnancy

Drugs for treatment

- STI drugs (per country protocol)
- Post-exposure prophylaxis of HIV transmission (PEP)
- Emergency contraceptive pills and/or copper-bearing intrauterine device (IUD)
- Tetanus
- Hepatitis B
- Pain relief
- Anxiety
- Sedation (includes children)
- Local anaesthetic for suturing
- Antibiotics

Administrative supplies

- Medical chart with pictograms
- Forms for recording post-rape care
- Consent forms
- Post-rape care information packets
- Safe for keeping records confidential

Considering constraints and changes

Given the sensitivities surrounding gender-based violence, programmes to address gender-based violence are likely to face constraints that may be difficult to overcome, particularly in emergency settings. Unfortunately, some constraints can be critical and can cause well-planned programmes to fail. The following factors may hinder the success of gender-based violence programmes but should not in and of themselves be the reason for not addressing gender-based violence:

▪ Cultural taboos about discussing human sexuality;

▪ Discriminatory social practices;

▪ Denial about the existence of gender-based violence;

▪ Lack of political will to address gender-based violence;

▪ Negative attitudes and practices towards girls and women;

▪ Limited power among women and girls over their sexual and reproductive lives;

▪ Gender-based violence is not considered a priority as people are focusing only on their immediate survival needs.

While designing the gender-based violence programme, it is important to consult members of the community to identify possible constraints and determine how to overcome them. Given the instability often inherent in emergencies, programme planning should include contingency plans for possible future changes, such as major population movements, sudden changes in political and/or economic conditions, shifts in community perceptions of/trust in aid agencies and programmes, and declining community participation. Programme implementers must be flexible and respond to changing conditions.

Identifying human resources

Despite recent increased attention in the humanitarian community to the essential and crosscutting nature of GBV, identifying human and material resources for gender-based violence activities in the acute emergency phase may be difficult, but as data above show, they are essential.

A successful gender-based violence programme requires well-trained staff and volunteers. It is important to properly train and appraise staff to avoid creating more harm to survivors. Members of the affected population should be a part of the staffing of programmes. In addition to contributing to overall implementation of the programme, they can provide information about community norms. It is, however, important to be aware that members of the community are likely to share experiences with the community. Local staff may have experienced or witnessed similar sexual attacks. Their contributions to the programme should not be at the expense of their own well-being.

As most gender-based violence victims are women and girls, it is important to recruit women to staff the programmes, including female physicians. While it is preferable for most women to be treated by another woman for gender-based violence -related issues, the absence of female practitioners should not prevent provision of services.

In cases where sexual violence is a contested issue and where there is potential for harm to those providing services, it is important to be aware and act accordingly.

Each staff member should have a clear role and a job description. Staff supervision and ongoing support is important to maintain motivation for delivering quality services, particularly for members who are not formally paid for their work.

The issue of secondary trauma to staff – local and international – should also be addressed. This includes health providers, counsellors, translators and others who will be hearing survivors' stories and seeing the consequences of gender-based violence. For more information on ways to address stress among staff, refer to the management section of this guide.

Education/training

Education about the nature and effects of gender-based violence is key to both prevention and appropriate response. Education of the community about gender-based violence should be undertaken as soon as possible. This should include information about the negative consequences that it has on people, families and communities, the services and resources available and mechanisms for preserving confidentiality and personal security. Women are usually the primary recipients of this education, but men in the community must be educated as well. It is also essential to educate staff in the health sector to be sure they have a shared understanding of gender-based violence and know what their expected roles and behaviours are vis-à-vis survivors. Many staffers may not be aware of gender-based violence or may have incorrect assumptions and negative attitudes towards survivors, which will likely affect the care they provide. In particular, staff/volunteers that will be interacting with survivors need to be trained to control their verbal and non-verbal facial expressions and body language. It cannot be assumed that all staff, whether local or expatriate, understand how to respond to survivors sensitively.

While there are certain aspects of response to gender-based violence that are specific to the role of the health sector, multi-sector training should be considered as a way to reinforce agreements on core principles of confidentiality and roles and mechanisms for coordination.

Training should be given to all who interact with survivors. Trainees should be able to identify the needs of survivors and their roles in providing assistance. Staff and volunteers should be trained to listen non-judgmentally, provide care and emotional support and identify assistance options. Relevant health staff to train include doctors, nurses, midwives, traditional birth attendants, community health workers, traditional health practitioners, clinic staff, social workers, health managers, administrators, coordinators, Ministry of Health staff, community health volunteers, teachers and social service and welfare ministry officials. These trainings can also be another opportunity to disseminate codes of conduct which, when enforced, help prevent abuse by humanitarians.

Case study: Sexual violence in Sierra Leone

Anyone can experience sexual violence

During a 2001 study of sexual violence in Sierra Leone, one older woman, a widow, revealed to the researchers that she had been raped during two different attacks during the 10-year-long conflict. Although she reported pain in her lower abdominal area after the second attack, and she thought it was linked to the rape, she said she was too ashamed to tell the staff at the health clinic what had happened to her. According to her, a woman her age (after menopause) was not supposed to have sex. When she went to the internally displaced persons' camp health clinic to seek treatment for the pain, she was given pills for worms and sent home. No one asked her whether she had experienced sexual violence or physically checked her. When researchers offered the woman a direct referral to a health facility, she refused because she was too ashamed of what had happened to her to get help.

It is important to convey to health staff during training that anyone can experience sexual violence.

Implementing gender-based violence programmes in the health sector

Gender-based violence is a sensitive issue. It is important to ensure that a gender-based violence programme is culturally appropriate and sensitive to the different needs of men and women and different age groups. It must be accessible and available to those who may be especially vulnerable, such as widows, older women, and adolescents. All care should be provided with compassion and confidentiality. All individuals who are actual victims or potential victims of sexual violence are entitled to the protection of, and respect for, their human rights. Rape in war is considered a war crime and crime against humanity and is characterized as a form of torture. In addition to the government's legal obligation to prevent sexual violence and ensure adequate health care services, health care providers should respect the rights of those who have suffered sexual violence.

Table 4-16: Rights health care providers should respect

Right	Description
Right to health	Survivors of gender-based violence have a right to receive quality health services that include reproductive healthcare to manage physical and psychological consequences of the abuse. This includes prevention and management of pregnancy, STIs.
Right to human dignity	Treatment should be consistent with the dignity and respect the victim is owed as a human being. This includes equitable access, quality healthcare services that ensure the patient's privacy and confidentiality of medical information, informed consent prior to treatment, a safe clinical environment and services in a language the survivor understands.
Right to non-discrimination	Laws, policies and practices related to healthcare access should not discriminate against a person who has suffered gender-based violence on any grounds (race, sex, colour or national origin). No one should be denied services.
Right to self-determination	Healthcare providers should not force or pressure examinations or treatment. All decisions regarding care are to be made by the survivor after receiving appropriate information that allows informed choices. Survivors have the right to decide whether they want to receive information, be examined, or get treated, as well as whom they want to accompany them.
Right to information	Information about treatment options should be individualized. The full range of choices must be presented regardless of the individual beliefs of the healthcare provider.
Right to privacy	Conditions for examination and treatment should be created to ensure privacy. Only people whose involvement is necessary in order to deliver medical care should be present during exams and treatment.
Right to confidentiality	All medical and health status information should be kept confidential. Only the survivor can give consent to the sharing of information with others, including family members. In the case of a charge filed with the police or other authorities, relevant information from the exam will need to be conveyed.

Confidentiality

It is critical that field staff ensure strict confidentiality about any specific incidents of sexual or gender-based violence. The possible consequences of inadequate confidentiality about these issues include the stigmatization of victims, violent revenge against those

committing the violent acts, and the reluctance of other victims to seek assistance. In addition to maintaining the anonymity of any victim's identity and the security of any written information about him/her and the incident, field staff should ensure that counselling and other activities are carried out in a manner that will not immediately identify individuals as victims of sexual violence.

The role of the health sector, in collaboration with other assistance mechanisms, is to reach out to and identify survivors, provide examinations and treatment, collect medical evidence, document as appropriate, and refer to other needed care.

At a minimum, care should include treatment and referral for complications of the effects of the sexual violence, including wounds, treatment or prevention of sexually transmitted infections, emergency contraception, counselling, referral to social services and psychological counselling and support services, as well as documentation and basic monitoring and evaluation.

When the situation becomes more stable, protocols for rape management should be established, and provision of services should be coordinated with more development-oriented activities, such as skills training and income generation for survivors. In these settings, various psychosocial services for the different types of GBV should also be established.

Monitoring and evaluation of gender-based violence programmes in the health sector

Monitoring and Evaluation (M&E) is an important process to meet the requirements of donors and other stakeholders and to maximize efficient and effective use of limited resources.

In the planning phase of the gender-based violence programme, key activities include doing a needs assessment, establishing priorities for action, identifying and defining the problems, objectives and goals of the GBV programme, and establishing indicators. In order to monitor progress and evaluate whether a programme has achieved the intended results, data must be gathered. Sources of data for GBV programmes can include quantitative and qualitative incident reports and other data collected during the programme implementation, as well as information from counterparts.

Monitoring

Regular monitoring is necessary for reviewing the progress of a gender-based violence programme activity in reaching the set objectives, as well as analyzing the prevention of sexual violence and response to incidents. Various tools, such as clinic registers, forms, and internal reports, may be used for both monitoring and programme management (especially supervision and decision-making). The involved sectors, frequency and methods used for monitoring should be decided by an established, multi-sectoral gender-based violence working group.

Indicators need to be understood within the context of the situation. For example, when a programme is established, you can expect to have increased reporting, but this does not mean there is more violence. The goal of such a programme is to encourage higher reporting and, therefore, better treatment and identification. Possible indicators include:

- Incidence of sexual violence;
  Monitor the number of cases of sexual violence reported to health services, protection and security officers;
- Supplies for universal precautions;
  Monitor the availability of supplies for universal precautions, such as gloves, protective clothing and disposal of sharp objects;
- Estimate of condom coverage
  Calculate the number of condoms available for distribution to the population;

- Estimate of coverage of clean delivery kits
  Calculate the number of clean delivery kits available to cover the estimated births in a given period of time[71].

*Table 4-17: Indicators for monitoring gender-based violence
messages disseminated through drama, community dialogues, etc.*

Performance indicator	Measure
Number of sensitization sessions /dissemination activities conducted during the quarter through drama, community dialogue, impromptu discussions and booklet clubs	Number of drama shows depicting manifestations of gender-based violence and its effects that were conducted during the reporting period in settlements (Programme Coordinators to identify technically skilled persons to encourage the social forums to develop drama scripts that communicate gender-based violence messages effectively. The drama scripts will focus on 4 types of gender-based violence, incidents and referral. The drama scripts will be developed by the end of the next period.)
	▪ Number of community dialogues on gender-based violence held in settlements
	▪ Number of door-to-door sensitizations carried out by community volunteers during the reporting period
	▪ Number of impromptu disscussions held
	▪ Number of booklet clubs held in the settlements
	▪ The activities are performed by Community Educators (CEs) working closely with community leaders and social forums. The CEs are supervised by Community Educator Supervisors.

Evaluation

Most programmes to prevent and respond to gender-based violence in peaceful and emergency settings have not been appropriately evaluated. This increases the likelihood that resources will be wasted and unsuccessful programmes replicated, with potential harm to intended beneficiaries. While evaluations are discussed in more detail in *the management chapter* of this book, it is important to look at a few specific items in evaluations as they relate to gender-based violence programmes. The table below outlines some sample questions for various gender-based violence issues that need to be evaluated.

Table 4-18: Sample questions for various gender-based violence issues

Issues	Sample questions
Coordination	▪ What multi-sector and interagency procedures, practices and reporting forms are in place in the current emergency?
	▪ Who established these procedures?
	▪ Are the procedures in writing and agreed upon by all actors?
	▪ What proportion of key actors participates in regular gender-based violence working group meetings? Do regular working group meetings include local community groups, local advocacy groups, local government or authorities?
Assessment and monitoring	▪ Are sexual violence incidents reported?
	▪ Who reports incidents and where are they reported?
	▪ Are incident reports shared and with whom?
	▪ Are stakeholders aware of the reports and analysis?

Issues	Sample questions
Protection	▪ Is reporting confidential? ▪ Where do sexual violence victims go to report? (Clinic, hospital, police, etc.) ▪ Is the community supportive of reporting? ▪ Do sexual violence victims feel comfortable reporting incidents of violence? ▪ What factors prevent victims from reporting incidents? ▪ Is protection necessary and/or available for those who report incidents of sexual violence in the community? ▪ What proportion of reported incidents choose to pursue legal redress? ▪ What proportion of reported incidents result in prosecution?
Water and sanitation	▪ Are there adequate numbers of latrines for each sex in the community? ▪ Do the latrines have locks? ▪ Are there adequate numbers of latrines for each sex at healthcare facilities or facilities that are considered reporting areas?
Food security and nutrition	▪ Are food distributions given directly to women? ▪ Are females involved in distribution committees?
Shelter, site planning, non-food items	▪ Is there a community-based plan for providing safe shelter for victims/survivors? ▪ Are sanitary supplies adequate and distributed to women and girls? ▪ Are women consulted and/or involved in programmes to address these needs?
Health and community services	▪ Are victims of sexual violence receiving timely and appropriate care? ▪ Are healthcare personnel trained in evaluation and treatment of sexual violence? ▪ Are community-based workers trained in sexual violence and psychosocial support?
Education	▪ Is there a code of conduct for teachers?
Information, education and communication	▪ Are IEC materials printed in the local language? ▪ Are there IEC materials that are also verbal or visual?

Evidence-based evaluation

In many situations, the absence of quantitative generalisable baseline data impedes the ability of service providers to plan for, obtain funding for, and implement essential health and psychosocial services for sexual violence survivors. Given the sheer magnitude and range of problems competing for gender-based violence funding and programmes in many countries, quantitative data can be essential to ensure that limited resources are directed towards the physical and mental needs of women who have experienced rape and sexual violence, as well as other forms of gender-based violence. The findings of population-based assessments of gender-based violence have wide-ranging implications, including: 1) determining patterns of sexual violence; 2) establishing women's health needs and service gaps; 3) forming policy recommendations regarding the physical and mental health needs of affected women; 4) promoting advocacy using data to discuss the extent of the problem and the needs; and 5) adequately implementing programmes to address identified needs.

An evidence-based survey can be applied to any situation (conflict or post-conflict) and any country. The evidence-based needs depend on the situation (internally displaced

person, refugee, host population, etc.), and the interventions must be tailored to each setting. The goals of a quantitative study are to credibly document the full scope of abuses and to understand patterns and predictors of abuse. Good quantitative work often reveals previously hidden patterns and underlying issues and can identify targets for intervention. If done properly, the findings can be generalized to larger populations, which case documentation does not permit. Solid quantitative research also can be a source of future leads for case documentation efforts and provide essential information for programme planning and funding requirements. In Sierra Leone, numbers around the issues of rape and sexual violence during the 10-year civil conflict in Sierra Leone permitted activists to assert that each "story is but one of the more than 64,000 women who experienced such sexual violations." These numbers helped humanitarian aid agencies better advocate for health services such as fistula repair and mental health programmes for women who had been subjected to sexual violence.

Case Study: Creative ways to discuss gender-based violence

In 2005, International Medical Corps (IMC) established a gender-based violence programme to address violence against women in refugee camps and the host communities in Hoima and Mbarara districts, Uganda. In the camps, IMC found that both the women and men feel it is culturally acceptable for a man to beat his wife, for a woman and even a young girl (12 yrs old) to be forced or kidnapped into marriage with her parents' consent for a price (a couple of goats), and for men to have multiple families but not support them.

To address these issues, IMC assembled a team of Community Educators to represent each of the nine zones in the camp and to raise awareness of issues such as domestic violence, early marriage, rape, the legal rights of women and children, and the importance of allowing girls to attend school. They go door-to-door and hold group discussions, community dialogues, and booklet clubs. The Community Educators started a unique programme in which they create and perform short plays for the community to educate them about GBV issues.

Performed in English, French and Swahili, the plays are dramatic reflections of current circumstances. For example, one play depicted the theme of early marriage through a true story about a 14-year-old girl whose parents allowed a 65-year-old man to kidnap and force her into marriage in exchange for money. The man was HIV positive, and the girl had to care for him until his death, when she found out that she was also is HIV positive.

In addition to this community awareness program, IMC also trains other stakeholders at the camp in addressing GBV. These stakeholders include other NGOs that providing services in the camp, refugee leaders, government representatives and the Ugandan Police.

Sexual violence

There are many types of sexual violence, and women face the risk of sexual violence during all phases of an emergency. Table 4-19 shows some types of violence. Unfortunately, you will note that note that Red Cross/Red Crescent National Society or other humanitarian staff can sometimes be the victims of sexual violence, but can also be the perpetrators of sexual violence. Rape is increasing being documented as a weapon of war. Refugee settlements can be unsafe and women may be forced to use sex as a means of securing food, shelter, and protection.

The following are a few examples of sexual violence that has occurred in disaster settings:

▪ Sexual violence increases during crisis. In East Timor, 23% of women reported sexual violence by men outside their family during the crisis period. After the crisis, that rate dropped to 10%;

▪ A survey of rape survivors in South Kivu region revealed that ninety-one percent suffered from one or several rape-related illnesses citing International Alert Report;

▪ Up to 40% of women were raped during Liberia's 14-year civil war; teenagers were the most targeted group;

▪ Half of rape survivors in northeast Uganda reported subsequent gynaecological problems, including chronic pelvic pain, abnormal vaginal discharge, infertility, vaginal and perineal tears, and fistula.

Table 4-19: Types of sexual violence

Phase	Type of violence
During conflict, prior to flight	▪ Abuse by those in power ▪ Sexual bartering of women ▪ Sexual violence and coercion by soldiers, rebels, fighters
During flight	▪ Sexual attack and/or coercion by bandits, border guards, pirates ▪ Capture for trafficking by smugglers, slave traders ▪ Capture by combatants for sexual slavery
In the country of asylum	▪ Sexual attack, extortion by persons in authority ▪ Sexual abuse of fostered girls ▪ Sexual attack when collecting water, wood, etc. ▪ Sex for survival
During repatriation	▪ Sexual abuse of those separated from their family ▪ Sexual abuse by persons in power ▪ Sexual attacks by bandits, border guards
During reintegration	▪ Sexual abuse as retribution ▪ Sexual extortion to obtain legal status

After sexual violence has occurred, there should be an initial phase that includes post-rape management. The minimum steps to providing care to women surviving rape include:

- Collecting forensic evidence;
- Performing physical and genital exam, and any necessary laboratory screenings;
- Performing wound care, including suturing tears;
- Providing prophylactic STI treatment for locally prevalent STIs;
- Providing post-exposure prophylaxis for HIV and hepatic B, depending on availability, client risk, and local HIV/hepatitis prevalence and protocols;
- Providing tetanus toxoid if indicated;
- Providing emergency contraception;
- Providing mental health care.

Especially where abortion services are not available, post abortion care services should be available as part of the health services available in refugee camps. In 1998 and 1999, more than 200 ethnic Burmese women and girls (averaging approximately 18-20 per month) at the Mae Tao Clinic in Thailand required treatment for abortion complications, including haemorrhage and infection.

5

Emergency mental health and psycho-social support

Visit to flood affected north Bangladesh Jigamarighat chor (chor is a small island in the river). Munima aged 25 sitting on the remains of her house which was completely destroyed by the flood.
Photo: Jenny Matthews/British Red Cross

Emergency mental health and psycho-social support

Description

This chapter intends to serve as a guide for setting up mental health and psychosocial programmes for vulnerable populations in developing countries who are or have been exposed to crisis events. It describes the psychological problems of people exposed to violence, disaster or critical incidents and provides guidelines for planning emergency mental health programmes.

Learning objectives

- To discuss the mental and emotional impact of exposure to disasters;
- To define what mental health programmes can contribute to an emergency response effort;
- To design the building blocks of a mental health care programme;
- To recognise the important factors for establishing long-lasting mental health programmes.

Key competencies

- To recognise the mental health problems and psycho-social suffering caused by disasters, displacement, social unrest and violence;
- To apply standard guidelines when designing, implementing or evaluating an emergency mental health programme;
- To recognise the factors that are important for establishing long-lasting mental health programmes.

Overview

There is no universally agreed upon definition of mental health. But people with good mental health have the following qualities in common:

- Being able to understand and respond to the challenges of day-to-day life.
- Being able to feel and to express a range of emotions.
- Being able to maintain good relationships among people in families and communities. Many factors, which could be biological or environmental, contribute to having good mental health. People are frequently exposed to positive as well as negative factors in their everyday life. Mental health problems occur when the stress from negative factors, such as pressure from work, illness or death in the family, or lack of income, greatly exceeds normal levels, or the exposure to these negative factors lasts for a long period of time. During social unrest, people's entire way of life is torn apart. Living conditions may become intolerable, and even the most basic needs may be lacking. These conditions, along with an uncertain future and a constant state of insecurity, put great stress on families and communities. Prolonged stress can break some people down emotionally and mentally, leading to mental health problems. These problems may exhibit themselves physically (fatigue, headache, back pains), emotionally (fear, anxiety, mood changes), or through major changes in behaviour (domestic violence, alcohol abuse). Many of these problems can be dealt with. If these problems are not treated early, people can suffer long after the emergency is over.

Mental health services are becoming a common part of post-emergency relief efforts. The aim of a mental health programme is to prevent or control the progression of mental health illness among displaced populations. Many lessons have been learnt from past mental health programmes. The key to setting up successful programmes is to link the experiences in treating mental health illness in developed countries with the cultural practices and traditions of the affected community in developing countries.

Introduction

> *I often have to talk about 'forgotten emergencies' and my responsibility is to alert the world to the emergencies it chooses to neglect. But the mental health crisis is not just neglected; it is also very much a hidden emergency. What we must do is bring it out of the shadows.*
>
> Jan Egeland
> United Nations Emergency Relief Coordinator 2004

Until recently, problems of psycho-social and mental health during and after humanitarian crises were ignored by health care workers and donors alike. Interest in these problems is now growing as their frequency and impact among trauma-affected populations has become more apparent. Those members of displaced populations or others who stay in disaster affected villages in need of psycho-social and mental health support represent several overlapping subpopulations of people, including those with:

- Disabling psychiatric illnesses;
- Severe psychological reactions to trauma; and
- Significant problems in individuals who experience temporary psychosocial and/or emotional stress that impairs their ability to function. This subgroup generally represents the majority of the population.

Psycho-social support programme in the Pakistan earthquake in 2005. Photo: Jakob Dall, Danish Red Cross

This chapter will discuss assessment, programme design and the general management of psycho-social and mental health issues in these subpopulations of affected populations. However, the reader should recognise that the movement to provide formal methods to assess problems, plan projects and evaluate interventions is quite new. Even now progress continues to be limited by a lack of widely accepted accurate assessment methods and of methods to assess programme impacts. Individuals suffering from psycho-social and mental health problems can often present differently in different environments and require interventions adapted to their situation and cultures. Yet most aid programmes continue to use assessment instruments developed in western countries for their programmes in other cultures without testing their local accuracy as well as to intervene using interventions developed again in the west without assessing their impact. As a result most interventions currently in use have never been evaluated for their feasibility or effectiveness in the contexts in which they are being used, especially among multicultural populations. Although evidence-based studies are becoming more frequent, where claims of

effectiveness have been made these have rarely been based on formal evaluation of impact.

Although there is a lack of evidence, programme design has relied heavily on ideological preferences. This has placed the psycho-social approach, which emphasises services to the whole community and avoids 'medicalisation' of problems, at odds with the mental illness approach. This last approach emphasises diagnosis and treatment of selected individuals. Lately however, a different kind of thinking has emerged that not only promotes the unification of the psycho-social, mental and public health approaches but equally emphasises community and medically based programmes with traditional multicultural and family centred structures. Whereas this thinking helps clarifying that extreme human-rights abuses and acute or moderate psycho-social reactions that are prevalent in humanitarian crises will no longer be simply medicalised, it forces the appreciation that a broader psycho-social, mental health, and public health services approach is necessary to address the variety of cultural, religious and political factors that threaten well-being among these populations.

Finally, the role of expatriate and local mental health professionals in designing and implementing interventions also needs to be defined. Those with specific skills should be properly identified and vetted to provide the best value-added expertise to a community-based approach. They will, thus, provide care where it is most needed. For example, psychiatric practitioners trained in developed countries can play a critical role in training, providing consultation, supervision and specialised care to the most seriously mentally ill. They will provide assessments and evidence-based investigations preferably through a culturally sensitive partnership with the local population, which might include indigenous healers and caregivers.

The community aid will best serve the population by ensuring that treatment for affected individuals improves the capacity of families to attend to basic survival needs, that there are safe places and clear information available and that directed resources advocate for a community-oriented approach and assist in designing programmes that monitor and evaluate its progress.[11]

Stressors, protective factors, and mental health disorders in humanitarian emergencies

Introduction to mental health disorders

Mental health care is concerned with normal as well as abnormal reactions to a given situation. One way of looking at mental health is to see the relationship between stressors, protective factors, and mental health problems, as well as the role of mental health services:

- **Stressors** challenge the ability of people and communities to cope.
- **Protective factors** help people continue to cope even at a time of crisis.
- **Mental health disorders** occur when stressors outweigh protective factors.
- **Mental health services** help people with mental health problems to recover and move forward with their lives.

Understanding the four parts to this relationship is essential for planning mental health programmes.
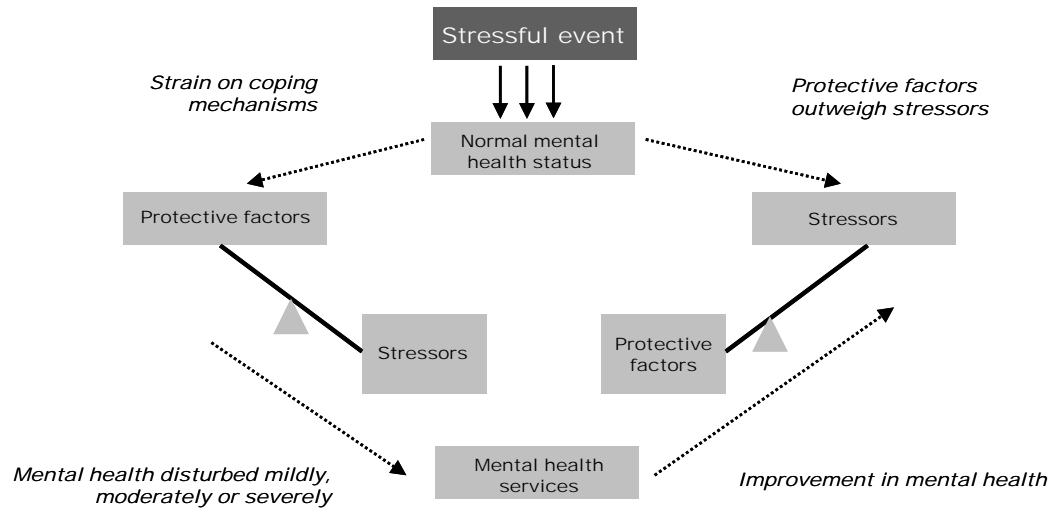
Stressors

Stressors are factors that add to people's stress. Stressors exist in everyday life (e.g., physical injury, a death in the family, or financial problems). They can cause reactions to problems or difficult situations that are positive or negative. Normal and healthy reactions to stress include a temporary dryness of mouth and feelings of fear or worry. The ability to cope with normal stress depends on various factors, including the nature of the stressor, access to social support, and prior level of functioning. If the stressed person is not cared for early or is ignored, it can develop into a serious mental health disorder. This can bring about the break-up of families and entire communities or even suicide.

Stressors in humanitarian emergencies should not be viewed in the same light as stressors in non-emergency situations. Displaced populations experience extreme forms of stressors (particularly in conflict situations). As a result, the behaviour of displaced people can only be partly compared to behaviour of the average non-displace population. Below is a list of unique stressors that displaced people commonly encounter during a humanitarian emergency:

The psychosocial environment
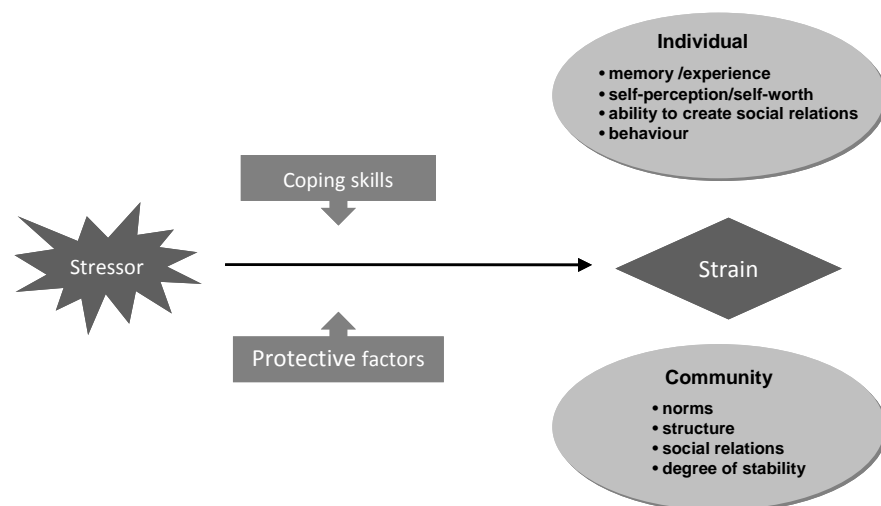
Displacement

Forced displacement, whether it results from conflict, persecution, violence, or social and political collapse, is one of the most stressful human experiences. Fleeing from war or civil strife is a more common factor in developing countries than displacement due to

natural disasters such as floods or famine. Forced displacement is often associated with multiple and prolonged exposure to three groups of stressors:

- *loss* (of family, homes, possessions, identity),
- *deprivation* (of basic needs, normal life, safety)
- *trauma* (from witnessing or experiencing rape, killing, etc.).

Displaced populations may be at increased risk of illness and deaths. Many deaths can occur due to physical exhaustion after fleeing from danger with only a few resources. Displaced populations may remain in camps for years or may later become refugees in a foreign country. In both situations, people have to adjust to unfamiliar surroundings and to a different way of life. For those who are able to return to their home, the negative changes that may have taken place in their absence (e.g., lost property, different community) can also cause high levels of stress.

Lack of basic needs

War and other major disasters can tear apart a society and deprive people of their means for survival. Farmers are not able to plant their seeds and markets close. People are forced to migrate to places that have little to offer them. Displaced populations in developing countries usually end up in camps or slums that are overcrowded, have poor sanitation, and have limited access to water, food, and health services. As a result, the affected population is exposed to higher risks of malnutrition, disease and death.

The relief response to an emergency situation aims at meeting the basic needs of displaced populations. Once people get the things that sustain life, other needs will appear more important.

It is only after people feel reasonably safe from harm, that belonging to a particular group and gaining self-respect becomes a priority. Some of these needs can only be met after rebuilding the community and resuming a normal life. The following Figure shows:

Maslow's ladder of basic human needs.

Self-Actualisation
To achieve personal growth
Esteem needs
To be respected, appreciated and valued
Social needs
To be part of the group
Safety needs
To be free from harm
Physiological needs
To have things which sustain life (food, water, shelter, medicine)
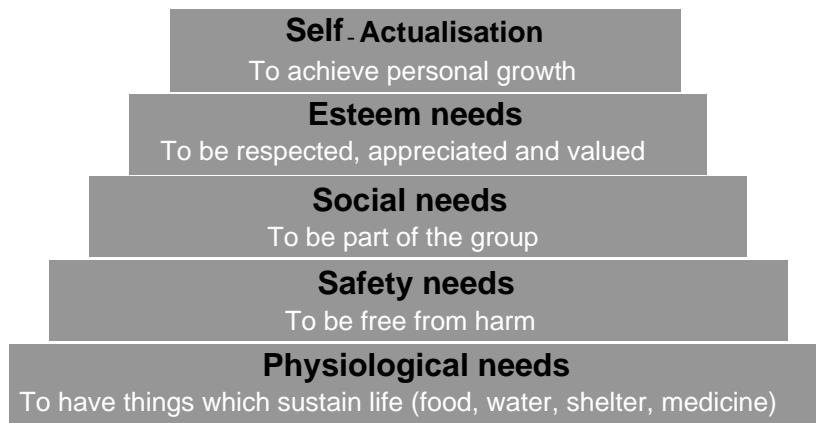
Social disruption

Social unrest disrupts the social support network of families and destroys their future hopes. Societies in developing countries are based on relationships within families and communities. People in non-emergency situations help one another to cope with stress. During a humanitarian emergency, chaos often disrupts the everyday rules and social practices of a community. Families can be broken apart by physical separations and by a breakdown in family functioning. Unlike women in refugee camps who retain their role as caretakers of children, men find it difficult to cope when they have no occupation. As a result, spouses may become abusive to one another and children may question moral or cultural values and become more defiant of their parents.

Exposure to violence

The greatest cause of stress is trauma. Forced displacement is often associated with violence, which may be due to political, ethnic or other factors. During social unrest, most people flee when they fear or witness violent acts such as murder, rape, robbery or torture. These experiences may produce long term physical, psychological and social consequences. Some people who are unable to cope may resort to alcohol or other forms of substance abuse. Others may become aggressive and violent. This causes displaced people to look at each other in a less supportive manner. The social order and rules of the community fall apart, and the affected people may continue to sense danger long after they are taken to safety.

Protective factors

Not everyone will respond to a stressful event in the same way. This is as true in extreme situations, such as war, as in everyday life. Protective factors are qualities in a person, or in the surrounding environment that shield a person emotionally and mentally from the full force of a stressful event. The fewer protective factors people have, the more likely they are to develop mental health problems. Knowing what protective factors exist among a displaced population can help agencies select which mental health services should be offered. The first step is to identify those groups or individuals that lack one or more of the following basic protective factors:

Prior level of functioning

People's level of functioning may vary according to their age, sex, personality type, cultural beliefs, etc. Therefore, not everyone comes to a stressful situation with equal abilities to cope mentally and emotionally. People who were having problems functioning before will be especially vulnerable to developing mental health problems during times of widespread violence and social unrest. For example, children who have been living on the streets are easy victims of violence, hunger, and abuse. Identifying such people and helping them cope during the emergency situation should be a priority for any emergency mental health programme.

Social support

The more social support an individual has, the better he or she is able to deal with stress. People separated from their family and community may have a more difficult time coping than people who are surrounded by their family members and community and have immediate access to support following exposure to a stressful event. Not only is being alone stressful, but the events that led to becoming separated from the family and community are often horrific. These people will have an increased risk for developing mental health problems.

> **Incident 1**
> *A traditional healer said she developed depressive illness after soldiers executed her son and two daughters, leaving her with only one son. She cries all through the night. She is not happy. She is alone with one son, so she (almost) has no one to help her, which makes her unhappy.*

Ability to cope

The ability to cope is generally greatest when the first stressful event occurs. As more stressful events occur, the likelihood of developing mental health problems increases. An example is a recovering rape victim. Given proper services, a woman has a reasonable chance of recovering her mental and emotional well being following a rape. However, if a victim is raped a second time, her mental health problems may be far worse than after the first rape. How long a person is exposed to a stressor also affects their ability to cope. For example, the suffering of someone kept in a prisoner of war camp for years may be greater than someone imprisoned for only a few months. In addition, the more intense or

traumatic the stressor is, the worse the emotional and mental health problems will be. Some traumatic events may be more deeply felt and have more long-lasting effects, e.g., torture, watching the slayings of family members, etc.

Emergency mental health services need to identify and reach people who have suffered repeated, prolonged, or extremely stressful events. Among this group could be anyone who has lived for a long time in a war zone.

Moral belief systems

People have an easier time recovering from traumatic events if they believe they are good, loyal members of the community, and if they believe living with their community is still good for them.

But, if they have broken moral codes important to the community, they may be tormented by their actions. Also, people may lose faith in the government if officials betray them or act in violent or immoral ways against its own people. Land may no longer be seen as fit for planting if killings took place there.

> **Incident 2**
> *A woman told of soldiers throwing her baby into the trees and then telling her to run before they shot her. She ran to save her own life, but several years later, she was still overwhelmed with guilt. She felt that, as a mother, she should not have considered her own life, and told workers she hears her baby crying almost everyday.*

> **Incident 3**
> *A soldier reported being forced to kill a prisoner of war as an act of initiation into a warring group he had been forced to join. Now, he thinks that slitting his own throat would be the only way to rid himself of the guilt he feels.*

Moral belief systems are deeply woven into the fabric of daily life. So much so that an outsider can never fully understand it. Local staff will be better able to understand how cultural and religious morals may have been broken. It is only by gaining proper understanding that mental health workers will learn how to help people heal after a breach of their moral belief system.

Return to normalcy

It must be remembered that displaced populations are people whose normal life has been disrupted by an emergency situation. A disruption that seems endless creates additional stress, fear, and lower self esteem. Dependency can develop which destroys the displaced person and his family's natural way of coping and can worsen symptoms of disability, even in extensive emergency health programs. The more quickly an individual is able to return to a structured daily life, the less likely a mental health problem will develop. For people who were forced to leave a community or have lost family members that they never see again, there may be no return to normal routine. The impact of stressors for these people stretch indefinitely into the future.

Mental health programmes should include efforts to help people go back to normal activities as soon as possible. Schools and cultural activities can bring back the feeling of normal life even in a displaced population settlement. Time for play can help children overcome their fears and remember a better time and place, no matter where they are. For women, a chance to talk together can be a comfort and a reminder of an old way of life, even in a prisoner of war camp. Having a chance to farm or work can help a man feel like a husband and father again, even if he is far from home. Repairing a damaged community building or resuming normal activities in a new location can be an external act that leads to healing *inside* a person and a community.

Emergency mental health and psycho-social support

5

Incident 4
A relief worker who had worked in Uganda told the story of women who had been raped during the fighting. It was seeing their village working again—fields planted, school buildings repaired, homes swept and neat—that gave them the feeling that they would be well again.

Mental health disorders

Surviving a disaster does not necessarily mean that a displaced population can cope with the emergency situation. Whether the negative effects of their experiences subside or become more severe will depend on the availability of psychosocial support. Lack of mental health care for people whose ability to cope with stressors is pushed to its limits, can increase their chances of developing a mental health disorder. Below is a list of the mental health problems commonly seen among displaced populations:

Mild mental disorders in children and adults

Not everyone in an emergency will develop severe mental illness. But the mental and emotional wellbeing of everyone who undergoes sadness and mourning may be affected for varying length of time. Constant feelings of loss or worry may be common, which can lead to depression and anxiety. Mild symptoms of anxiety and depression may be present in a large number of people. Even after the day-to-day life of a village is restored, people will struggle to regain the feelings of trust and safety that once made them feel like a community. These problems can be addressed in many ways, such as community wide programmes like public education, community projects, and cultural rituals and festivals.

Somatisation

Somatisation is present when a person's emotional problems affect how he or she feels physically. For example, anxiety or depression may be expressed as different symptoms, including fatigue, gastrointestinal problems, headache, sexual dysfunction, etc. People with a somatisation disorder believe that a physical illness is causing their health problems. However, the true source of the problem is emotional.

Health workers in Africa report that in conflict zones, patients frequently complain of malaria, headache, and sleeplessness assume there is a physical reason they are not feeling better. They expect medical treatment to cure the problem. However, after taking the patient's history, the health workers note that the symptoms often appeared shortly after the patient had been displaced, exposed to violence, or lost a member of his family. The patient's physical complaints can be stopped without any medical treatment simply by talking to the patient about his ordeal or directing him to an agency that can address other underlying problems and help him function as a member of the community.

Depression

Depression can be defined as intense and prolonged feelings of sadness, tiredness, hopelessness, or lacking interest in normal activities. It may be caused by a feeling of not having control over things that are happening, or by feeling cut off from familiar people and places. Depression is a common reaction in children who are separated from their parents. It is also a common reaction to the loss of family, community, or property.

Depression can also occur in people who are disappointed in themselves for something they have done or not done. Depression sometimes leads to suicide. Some people will take active steps to end their life. Others may take a less obvious approach, such as placing themselves in danger, not taking care of a medical condition, or not eating. It is common to hear stories of people who intentionally provoke a soldier, break curfew, or violate other rule s, hoping that someone will kill them. Depression often causes increased irritability and a tendency to lose control more quickly. This seems to be especially true in children. In men and boys, depression may lead to increased aggression. In women, depression may prevent them from caring for themselves or their children.

Behaviour problems in children

When parents lose authority, families can fall apart. Many children will respond to confusion and fright by isolating themselves from others or by misbehaving. Once children have seen their parents lose control over family life, they may no longer be able to trust their parents to take care of them. Problems like bed-wetting, nightmares, clinging, and lack of interest are common among children who are nervous or scared.

Alcohol and drug abuse

People who feel, that life has become too much to bear commonly use alcohol and drugs as an escape. These substances may also be considered a means for dealing with anxiety, depression, or a number of other problems including sleeplessness. An increase in alcohol and drug abuse is common after widespread social unrest. However, substance abuse does not reduce the stress. Instead, it reduces one's ability to cope. Substance abuse over a long time leads to more problems for the individual, the family, and the community.

Psychosis

Psychosis means losing touch with reality. It can range in severity from mild distortions of reality to hearing or seeing things that are not there. People who become psychotic during a humanitarian emergency may have symptoms related to their experience, for example:

- People displaced and caught in fighting may lose touch with the world around them and become convinced they are safe at home.
- Victims of violence may hear screams and see blood long after they have been taken to safety. People who are severely psychotic may be agitated or aggressive. Full recovery from this condition is possible if it is detected and treated early.

Post traumatic stress disorder (PTSD)

Post-traumatic stress disorder (PTSD) is a mental illness in people who have been exposed to severe violence or abuse. People suffering from PTSD have painful memories about the trauma, even when they try to forget what happened. Because they have difficulty in differentiating the real world from the unreal, they always have a feeling of being on guard, ready to run or fight at a moment's notice. People often avoid things that remind them of the trauma as a way to stop the memories from coming back. The merican author, Annie Dillard, uses metaphors to describe memory as follows:

Dillard describes memory as standing beside a stream and those events that are in the present are right before us. As time passes, the events move further down stream, eventually tumbling over the edge of a waterfall out of view, and out of our everyday awareness.
In her description of traumatic memories, Dillard talks about events as hovering at the edge of the waterfall but never tumbling over and out of view; events we remember often no matter how long ago they happened.

Having unpleasant memories that do not fade is the core of post traumatic stress disorder. Individuals who have experienced a traumatic event often talk about how much they try to "forget" but continue to recall the terrible event and suffer the emotional impact all over again.

Incident 5
A woman talked about being raped by soldiers, along with a group of women. Because it was dark, her most vivid recollection was the sound of cloth being ripped as the dresses were torn from the women's bodies. She said even now, several years after the event, if she hears cloth being ripped, it "all comes back to her."

> **Incident 6**
> A child reported having trouble staying in school because there was a boy in her class with the same name as the neighbour who had killed her family. She knows, and tells herself all the time, the boy in her class has nothing to do with the killer, but when she hears the teacher call his name, she remembers watching her family die and feels overwhelmed with fear.

If left untreated, PTSD can become part of a person's personality and can prevent them from functioning normally. Children with untreated PTSD often believe they will not live into adulthood. They also may become much more aggressive if the violence they have seen becomes a part of their play and behaviour. For adults and children alike, PTSD can lead to secondary disorders such as depression.

Conclusion on mental health disorders

Mental health disorders can be recognised as signals of severe and persistent stress. One may even fear that displaced populations would be unable to resume normal physical and psychological function after being settled in a more secure and less traumatising setting. The majority of people affected by humanitarian emergencies do have the capacity and ability to cope, with or without external help, and avoid the long-term effects of their negative experiences. There are also reports of displaced people becoming more mature and active within their community than they might have become under normal circumstances. A solution, however, is necessary for the few displaced people who are at risk of developing or actually have depression or other severe mental health disorders. Community-based mental health care is the best solution.

General measures

This section does not intend to provide or recommend detailed programme design and assessment protocols. Assessments are covered at length in the epidemiology chapter of this book. The Inter Agency Standing Committee Guidelines on Mental Health and Psycho-social Support in Emergency Settings[12] and the Sphere handbook[6] have comprehensive sections on psychosocial and mental health support. However, common guiding principles and strategies for the aid community in developing interventions for populations exposed to extreme stressors include:

- Contingency planning before the acute emergency;
- Assessment and, if possible, base-line studies before intervention;
- Inclusion of long-term development perspectives;
- Collaboration between agencies;
- Provision of treatment in primary care and community settings;
- Access for all in need to services, including for responders in need;
- Training and supervision; and
- Monitoring indicators including project impact.

Initial considerations for assessment and programme development

Culture can be considered, in part, to be a collection of 'coping mechanisms' or behaviours shared by a group of people. These behaviours are learned ways of navigating the world safely and, having been developed and refined over centuries, these behaviours are often recognised as defining a culture and its strengths. Strengths exist within an individual and the social structure within the community. Disasters, especially those resulting in displacement, involve upheaval to the extent that many of these behaviours are no longer appropriate or possible. To assist with supporting pre-existing coping strategies, psycho-social programming in the immediate period after a crisis should include support for and approaches aimed at making as many of these behaviours as

possible appropriate and possible once more. This consists in re-establishing many of the physical and social structures that existed prior to the disaster, including:

- Reconnecting families;
- Reconnecting communities;
- Re-establishing security; and
- Facilitating community motivation, ownership and control of the emergency response.

The psychosocial and mental health response in the immediate post disaster period often emphasises this type of approach. This can include, but is not limited to, the re-establishment of schools, the development of appropriate employment strategies and the reintroduction of social structures that are important to the local population. In addition, a programme of what is commonly referred to as

*Chad - Photo:
International Federation*

'Psychological First Aid' can be introduced. It is both an assessment strategy as well as an intervention and entails basic, non-intrusive pragmatic care with a focus on listening but not forcing talk, while assessing needs and ensuring that basic needs are met, encouraging but not forcing company from significant others and protecting the affected population from further harm. With this approach, many of the 'symptoms' of mental health disorders might be resolved, increasing the likelihood that those who continue to have symptoms have specific disorders that require specific treatment.

In Palestine, a school-based programme has been implemented by the Palestine Red Crescent Society, supported by the Danish Red Cross, the French Red Cross and the Icelandic Red Cross. The programme's objectives are to enhance the psychosocial well-being of children and their families, to improve the interaction between children, peers and their teachers as well as the interaction between parents and the schools, and to strengthen the social fabric in the communities. The primary beneficiaries of the programme are children in fifth and sixth grades who attend weekly workshops, facilitated by teachers, which aim at reducing the stress and insecurity experienced by the children in their daily life. The children's parents are an important secondary target group who are sensitised on the reactions of their children and how they might support a healthy child development.

Three indicators are defined for the programme: playfulness, trust and tolerance. In order to document the effects of the programme, children and parents are given at the outset of the school year a self-reporting questionnaire which provides information on each of the three indicators, asking them to rate a number of statements on a scale. This exercise is repeated at the end of the school year where it is complemented by focus group discussions that explore the same issues and provide qualitative data to complement the statistical information. Throughout the school year continuous monitoring takes place by the teachers who run the workshops for children. These various tools provide an excellent opportunity to follow both the progress of implementation and the qualitative changes that are seen from the programme.

Mental health assessment, monitoring and evaluation

The development of a locally and culturally valid, evidence-based intervention programme begins with the assessment of the existing mental health and psycho-social strategies and their capacity and capability to function in a crisis situation. Assessments should use standardised approaches which are discussed in the epidemiology chapter of this book and must be easily applied by relief organisations. The authors begin mental health assessments with a *qualitative* study of the target population in order to understand local perceptions of problems and resources. This information is necessary in order to select which problems to address, to design both accurate assessment tools and feasible interventions. Using qualitative methods in this way increases the likelihood that interventions will be both feasible and effective as well as increasing the accuracy and appropriateness of assessment tools. The qualitative data informs the development and adaptation of indicators for identifying people with psycho-social and mental health problems, indicators for evaluating the effectiveness of programming to address these problems and information for the adaptation of interventions to ensure local appropriateness. From the beginning of the programme's design, its monitoring and evaluation, qualitative data gathered from the community is used specifically to guide a crisis monitoring and evaluation workshop to:

- Train those involved in mental health programmes how to design programmes around goals;
- Train in designing indicators (see programme indicator section below); and
- Use these skills collaboratively to design the project with aid community staff.

Making contacts with the affected community

In developing countries, most people in rural communities associate with people they know well. Observing traditions and customs is highly valued. Bringing in outsiders to create and deliver a mental health programme can create communication barriers between staff members and the people they want to help. Any mental health programme that is introduced to a community as part of emergency relief services needs to first link with the affected community. A top priority of the incoming programme officers should be to identify and consult with community leaders, to seek their advice, and to make sure they participate in decision-making throughout the life of the project.

Measuring need and resources

A multi-sectoral assessment team, which includes members of the displaced population, can be organised to gather the priority information for setting up a mental health program. Carrying out a mental health assessment helps to identify the unmet physical and psychosocial needs as well as to reassure displaced people that they are under caring, concerned and competent emergency service providers. Areas to assess include the ability of the displaced individuals to do what they need to do everyday and to assume an active social role in the community. Efforts should be made to carefully adapt any assessment checklist or survey brought in from the outside to assess the people being served. The following checklist may be used for a mental health assessment only after being adapted to the local situation:

Background on disaster:	**Mental health symptoms**:
▪ Demographic profile — total population, number of men, women, children, elderly. ▪ Disaster experiences — pre-flight, flight, camp, etc. ▪ Population characteristics — language, religion, rural or urban culture, level of education.	▪ Physical – fatigue, headache, aches and pains, etc. ▪ Emotional – feeling sad, hopeless, anxious, lack of interest ▪ Behavioural – alcoholism, drug abuse, aggression ▪ Difficulty in recognising real from unreal

Health status: ■ Common causes of deaths (serious injury, disease) ■ Common causes of illness (serious injury, disease) ■ Nutritional status and micro-nutrient deficiencies **Trauma events (experienced, witnessed, or heard about):** ■ Rape or sexual abuse ■ Torture or isolation ■ Unnatural death or murder of family or friend ■ Forced family separations ■ Lost or kidnapped ■ Any other frightening event	events, frequent, painful memories of past events Resources available: ■ Local services: PHC, schools, mental health care ■ Social support network (family, peers, neighbours) ■ Community services: traditional healing, religious or traditional ceremonies ■ Technical resources of mental health and social workers, drugs, and health services ■ National curriculum on mental health training ■ National policy on mental health care

In addition to the above information, special surveys should be carried out. These surveys are listed and are discussed in detail below.

- a) **Identify local beliefs and customs about mental illness.**
- b) **Screen the general population and identify those with mental health problems.**
- c) **Individual evaluation of anyone identified as having a mental health problem.**

a) Identify local beliefs and customs about mental illness

It is important to identify local terms and traditional beliefs about the causes of mental health problems. This will help identify coping behaviour and the resources available locally for mental health care. The displaced people classified mental illness into two categories — *traditional illnesses* and *illnesses from God*.

Traditional illnesses were defined as those due to evil intent of the living (e.g., witchcraft), bad spirits, or the dead. These illnesses are not recognised by western medicine and cannot be treated by them unlike illnesses from God. In fact, an important way of diagnosing traditional illnesses is for a doctor not to find anything wrong with the patient. Most of what developed countries describe as mental illness falls into the traditional illness category and is, therefore, often ignored by clinics and hospitals.

b) Screen the general population

Because individual screening is not practical for a large displaced population, it will be necessary to first identify people that have the greatest difficulty functioning. There are various ways of collecting this information including carrying out interviews, focus group discussions, surveys. The following sources of information may be approached:

- *Community health workers*—to identify individuals with frequent physical symptoms, e.g., headache, gastrointestinal disorders, respiratory symptoms, etc.
- *Health workers*—to identify cases of attempted suicide of other illness of uncertain cause.
- *Social services workers*—to identify and assist individuals who cannot function, e.g., mothers neglecting their children, families with reported domestic violence, etc.
- *Field officers/Camp officials*—they may have access to a wide range of information about the health and well-being of a displaced population in a settlement.
- *Community leaders/officials*—they are often aware of families and individuals facing more difficulties then others in the community, e.g., substance abuse, malnutrition, etc.
- *Family system*—family members often endure common stressors. Ask parents to identify troubled children and then investigate the whole family.
- *Traditional health care providers*—they may report on those who visit them most frequently or have major health problems.

■ *School teachers* (in formal or indigenous schools)—to identify children and adolescents who have problems paying attention or are withdrawn.

c) Individual Evaluation

Every person suspected of having a mental health problem through the general screening should be referred to the health facility for an individual mental health evaluation. This will help identify the nature of the problem and determine the effects of the emergency experiences. Standard evaluation instruments may be used, which allow an individual to disclose more about his/her psychological state and trauma experiences than they might otherwise do.

Programme indicators

Indictors to monitor a programme's process, satisfaction and outcomes should be defined for each objective or activity. The Inter-Agency Standing Committee on Mental Health and Psychosocial support in emergency settings has created guidelines that include sample process indicators for each of a series of actitivies.[2] Generally, the key psychological and psychiatric functional indicators based on Sphere standards for interventions are:

■ Individuals after experiencing acute mental health distress after exposure to traumatic stressors must have access to psychological first aid at health services facilities and in the community;

■ Care for urgent psychiatric complaints must be made available through the primary health care system;

■ Individuals with pre-existing psychiatric disorders must continue to receive relevant treatment. Harmful and sudden discontinuation of medications must be avoided. Patients' basic needs in custodial psychiatric hospitals must be addressed; and

■ If the crisis becomes protracted, plans must be initiated to provide a more comprehensive range of community-based psychological interventions for the post-crisis phase.

In many situations ethnographically informed quantitative measures will have to be generated for each programme because cultural and context specific issues can vary widely across crises. When possible, indicators should cover macro-level factors (e.g. economic opportunities, social capital and human rights violations), individual-level factors (e.g. mental health symptoms, disabilities and differences in targeted behaviour) and access to and availability of psycho-social and mental health resources. Indicators should encompass data collected at multiple levels of programming and include access to services (culturally-based and those being provided by international NGOs), aspects of programme implementation and daily functioning of beneficiaries.

Programme monitoring and evaluation

Programme monitoring is focused on implementing and analysing programme process indicators which assess whether the programme is implemented as planned and identify if it can maintain its *quality*. On the other hand, programme evaluation should focus on the programme's impact including its goals. While this approach is important, it has its limitations because it does not consider the potential for the programme's unexpected positive and negative effects. A brief qualitative study conducted after a programme is completed will be useful to identify the unexpected outcomes from the perspective of the programme's participants. This process can be used further in progress reports and briefings where comparison data, based on questions asked at baseline and after the intervention is complete, provide a measure of change from pre- to post-intervention.

Evaluating the programme after it has begun can help ensure that the programme stays on course and that objectives are being met. The following table highlights information that may be useful for evaluating a mental health programme.

1. What were the objectives of the programme? To what extent were they achieved?
2. Was the strategy valid, appropriate, and adequate?
3. How was the programme started, organised, and run? Was the organisation and decision-making favourable for achieving the objectives?
4. Did the programme help the growth of new links and networks between different communities and with concerned agencies?
5. What were the benefits of the programme? Who was supposed to benefit and who actually did benefit?
6. What effect did the programme have on the affected community's coping mechanisms for their situation?
7. Did the programme foster or damage these coping mechanisms? Was dependency created?
8. What effect did the programme have on the social processes in terms of how things got done in the affected community?
9. What effect did the programme have on the ways in which the affected community interact?
10. What effect did the programme have on the ways in which groups of the community participate in public life?

Risk factors and intervention strategies

This section presents information about risk factors that not only increase the likelihood of individuals and populations developing psycho-social and mental health problems but also compound the problems for those with pre-existing problems. Intervention strategies will be presented that focus on the three important subpopulations mentioned at the beginning of the chapter.

Risk factors

Various factors increase the risk of developing new and also compounding both new and old problems that already exist among populations exposed to severe stress. These factors include, but are not limited to:

▪ Poor health and nutrition;

▪ Suboptimum prenatal care and increased risk of birth injuries;

▪ Separation from family and caregivers;

▪ Neglect and under-stimulation of children;

▪ Exposure to chronic communicable diseases that affect the brain;

▪ Risk of traumatic epilepsy; and

▪ Exposure to extreme and repeated stress.

Furthermore, conditions provoked by disasters, conflict, displacement or prolonged vulnerabilities often place those with pre-existing problems at greater risk of:

▪ Abuse, including gross dereliction, stigma, ostracism, sexual violence;

▪ Child abduction, youth violence and death;

▪ Family separation and displacement;

▪ Neglect or abandonment by family and caretakers;

- Exploitation;
- Destruction of supportive institutions and services including psychiatric facilities and medications;
- Life threatening physical illnesses and suicide;
- Conditions that foment hatred and revenge; and
- Unremitting conditions that lead to worsening disability and premature death, especially among the elderly.

The behaviour of neglected and abused mentally ill people in an emergency or post-disaster setting can lead to an erosive impact on displaced communities' already fragile social fabric.

Interventions

Immediate psycho-social interventions should focus on supporting public health activities to reduce mortality and morbidity, to mitigate the community's burden from having to manage the seriously mentally ill who need specialised psychiatric care and to help mobilise community-based resiliency and adaptation to new circumstances that affect people in an emergency. Initial research indicates that these immediate interventions might mitigate more serious mental illness in a large proportion of the affected population.

In Pakistan, following the earthquake in October 2005, a massive humanitarian intervention was launched aiming to reduce the immense suffering experienced by the population. With over *Photo: International Federation* 80,000 dead and several hundred thousand people displaced, this was an immense challenge, bearing in mind that the area in which the earthquake hit was remote and mountainous, making access a crucial issue. In order to ensure a coordinated approach to addressing both physical and emotional wounds that were evident, a unified approach was set in motion, in which the International Federation, the French and Danish Red Cross collaborated to organise outreach medical teams that could cover a large geographical area as well as provide a comprehensive response in terms of targeting needs in the areas of physical and mental health, water and sanitation and community-based first aid. Such emergency interventions pave the way for a sustainable and long-lasting return to normal life by addressing the needs in the local settings in which people live.

Disabling psychiatric illnesses

Pre-existing psychoses and severe mood disorders which include the DSM-IV defined diagnoses of major depression and bipolar disease cause considerable disability in every culture worldwide. How these disorders are conceptualised, recognised and managed across cultures and in a conflict or post-conflict situation might differ considerably. While it may be possible to diagnose pre-existing psychotic disorders after a crisis event, providing sustained and effective treatment can be difficult. This places considerable stress on families whose members have severe illness and might exacerbate the present stress on the camp population especially if there is any disruptive behaviour within the camp. For pre-existing anxiety and mood disorders, it is often impossible to distinguish the symptoms of these disorders from normal responses to an overwhelming crisis event.

While emergency health services usually do not have many mental health personnel at all including psychiatrists, there is some promise in programmes that have used local

psychiatric nurses and community volunteers to provide services. Whenever possible, psychiatric interventions should be included as part of the established primary healthcare system, but even these resources might be severely lacking.

For the severely mentally ill, the impact of treatment is often dramatic with the reintroduction of antipsychotic medications and supportive community follow-up which can also include rehabilitation within traditional family structures. In camps, community volunteers can provide outreach services, family education, support and links to other agencies that can assist with rehabilitation.

It must be acknowledged that newer psychotropic medications, particularly those that are often familiar to foreign aid workers with experience in psychiatric treatment, are both scarce and prohibitively expensive. Aid workers, however, must advocate for what is best for the populations they are working with and co-ordinate all requirements with the ability of local healthcare workers to sustain any medications from outside resources.

Severe psychological reactions to trauma

Researchers talk of the 'power of displacement,' the cultural shock of which can cause cognitive and emotional disorganisation in a popu- lation. This is often catalysed by a degree of 'experienced brutality,' which, because of the fear of possible reprisal and stigma, might not be easily or readily recognised by healthcare workers. Beyond the physical suffering that occurs, displaced people are deprived of their

A survivor from Balakot sits on a collapsed roof looking at the destruction around him.
Photo: Till Mayer / International Federation

livelihoods and often suffer a loss of identity, purpose and community. Displacement camps are frequently overcrowded, poorly designed and poorly serviced. When war and conflict damage traditional ways of life, cultural and individual bereavement can be key determinants of psycho-logical distress. It is common for a population after experiencing success in ethnically relevant community programmes aimed at the severely mentally ill to see the same programmes have a sudden increase in people presenting themselves with acute trauma related symptoms. This suggests that the initial barriers of stigma and suspicion tend to decrease with time.

Options for programming include both community-based interventions and more conventional 'western-oriented' one-to-one therapies. Identifying the local population's problems and needs will assist the decision about which direction to focus on. Mental health problems common to populations without a history of pre-existing mental illness but with a history of trauma exposure and problems particularly experienced by children and adolescents include several of the psychiatric diagnoses defined in the DSM-IV:

▪ Situational depression and major depressive disorder;

▪ Drug and alcohol abuse;

▪ Somatisation;

▪ Anxiety;

▪ Post-traumatic Stress Disorder (PTSD); and

▪ Co-morbidity of depression and post-traumatic stress disorder.

Historically, researchers and health care providers have assumed that, given the experience of trauma, high rates of post-traumatic stress disorder in the population would naturally be present. The claims of large populations experiencing post-traumatic stress disorder have only limited evidence: research is showing that only a minority of those exposed to mass violence suffer from this disorder; numbers vary from 4% to 20%. A

purely medical model of intervention that focuses on post-traumatic stress disorder to the exclusion of other diagnoses is, therefore, problematic because it might fail to address other problems present in the population. Epidemiological evidence, however, indicates that symptoms commonly associated with both post-traumatic stress disorder and depression have been identified in most cultures that have been investigated. Ethnographic assessments have determined that just having a language for relevant symptoms helps communities be able to identify individuals suffering from these disorders.

Temporary psychosocial and/or behavioural problems

There is a natural overlap of those with temporary psychosocial and behavioural problems and those who have severe psychological reactions to trauma. However the complaints presenting in those suffering from only temporary psychosocial problems generally differ in degree and often demonstrate a greater ability to cope and adapt. For this population, when culture and community cohesiveness determines, generally, how war, trauma and displacement are experienced and coped with, programmatic emphasis can be placed on community-based programmes which focus on 'strengthening family and kinship ties, promoting indigenous healing methods, facilitating community participation in decision-making, fostering leadership structures, and re-establishing spiritual, religious, social, and cultural institutions and practices that restore a framework of cohesion and purpose for the whole community.'[4] The goal of programmes for this population is to encourage and strengthen the population's pre-existing coping and adaptive capacities. Strategies could also be developed that reduce stress and encourage normal activities and active participation of those who have been displaced. Examples are:

- Establishing cultural and religious events, including funeral ceremonies and grieving rituals that involve spiritual and religious practitioners;
- Restarting formal or informal schooling and recreational activities;
- Promoting adult and adolescent participation in relief activities, especially those that facilitate the inclusion of social networks of people without families;
- Organising community-based self-help support groups that are especially focused on problem-sharing, brainstorming for solutions, effective ways of coping, mutual emotional support and community-level initiatives; and
- Economic redevelopment initiatives such as micro credit or income-generating activities.

3. Setting goals and objectives

It is important to set goals and objectives of an emergency mental health programme to provide a basis for all activities as well as for evaluating the program's success. Below are examples of **goals** that may be appropriate:

- to restore normal functioning among the affected population,
- to relieve and alleviate stress and psychological suffering resulting from the emergency situation,
- Immediate and long-term **objectives** should be defined that can help achieve the goals that have been set. Objectives are useful for monitoring the effectiveness of the program.

Below is a list of possible objectives:
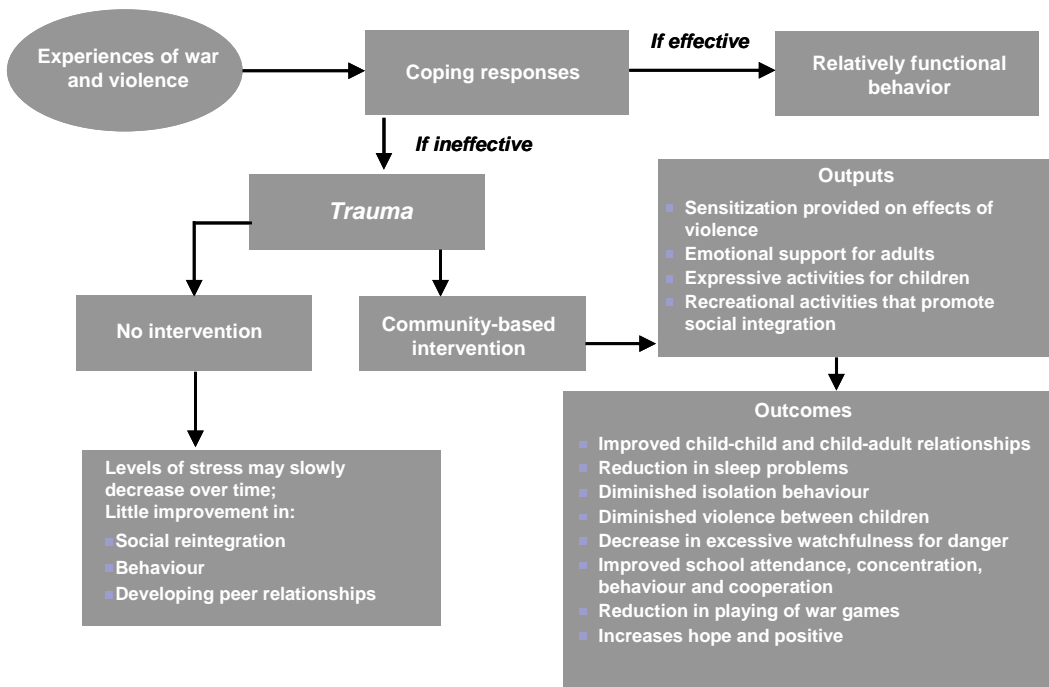
- to help the people in the affected community understand the current situation and their options,
- to increase awareness about normal and abnormal reactions to stress,
- to mobilise social support within the community,
- to reinforce normal coping mechanisms,
- to identify those individuals who are unable to cope,
- to offer support to those who cannot cope with the current situation,

- to effectively prevent milder mental health problems from becoming long-lasting mental health disorders,
- to reduce the need for medical treatment in somatisation disorders.

Psychosocial responses and action

```
┌─────────────────┐          ┌─────────────────┐  If effective   ┌─────────────────────┐
│ Experiences of  │ ───────▶ │ Coping responses│ ──────────────▶ │ Relatively functional│
│  war and violence│         │                 │                 │      behavior        │
└─────────────────┘          └─────────────────┘                 └─────────────────────┘
                                      │
                               If ineffective
                                      ▼
```

Outputs
- Sensitization provided on effects of violence
- Emotional support for adults
- Expressive activities for children
- Recreational activities that promote social integration

Trauma

No intervention   Community-based intervention

Levels of stress may slowly decrease over time;
Little improvement in:
- Social reintegration
- Behaviour
- Developing peer relationships

Outcomes
- Improved child-child and child-adult relationships
- Reduction in sleep problems
- Diminished isolation behaviour
- Diminished violence between children
- Decrease in excessive watchfulness for danger
- Improved school attendance, concentration, behaviour and cooperation
- Reduction in playing of war games
- Increases hope and positive

4. Developing the right approach

Emergency mental health programmes differ from traditional mental health care systems in terms of who benefits and how services are provided.

During the *acute emergency stage*, most relief agencies focus on providing basic needs such as food, water, sanitation, health care and shelter. Because most of the survivors appear to cope, establishing an emergency mental health programme may not be a priority at this stage. However, mental health needs, can still be addressed in a general way, to prevent long-term consequences. The following measures may be adequate:

- Reinforcing normal everyday routines, such as fetching water and cooking.
- Encouraging the population to form communities.
- Linking vulnerable groups such as children, women, or the elderly to existing services and resources.

During the *post-emergency stage*, some degree of social order and daily routine may have become established among the affected population. Having adequate family support under these circumstances can help most displaced people to recover over time, without need for emergency mental health services. However, certain people, because of their individual characteristics or exposure to more stressors, may experience persisting mental health problems. These individuals should be evaluated to determine the appropriate level of mental health services they need to help them achieve the reconstruction phase.

5. Working toward a sustainable programme

Ways of sustaining a programme should be determined at every step of programme planning. Displaced people may suffer from mental health problems for years after the emergency is over. Many people continue to suffer long after the relief agencies pull out from the program, and the effects can be felt well into future generations. Even though there is much sympathy for these problems, resources for promoting mental health care

for displaced populations are extremely limited. Therefore, the design of the programme should not be too ambitious and planners should develop cost-effective ways of complementing the program, which focus mainly on local resources and volunteers. From the start, relief agencies must decide how long they are going to support mental health services.

Well-established mental health services may not be suitable for relief programmes that are supported for two years or less. Programmes that intend to go on longer should have a well-developed plan in place that shows how the programme will continue both financially and administratively.

It is important to gain the support of the local health system, locally-based relief groups, and any NGOs. Externally supported mental health programmes often bring resources that local health care systems lack, such as transportation, and technical and financial support. Below is a list of the benefits from mental health programmes that link with local health care systems:

- . gaining the co-operation of all health care providers,
- . increasing likelihood of being able to educate general health care providers about mental health. This increases the network of individuals who can provide services.
  . more easily overcoming misgivings and misunderstandings the local community may have about mental health services.

6. Train the trainers model

A word of caution may be in order for programmes that are considering a "train the trainers" model. This model is built on the idea that the number of service providers can be greatly expanded when each newly trained and third generation of trainees. The quality of the overall programme deteriorate worker trains a new group of workers, and so on. While this model sounds good in theory, in practice there is often no quality control over the secos rapidly.

Selecting mental health services

A basic building block of any mental health programme is choosing the types of services to be provided. The best choice depends on the needs and traditions of the people being served, and the resources available. The following services have been included in existing mental health programmes:

General measures

Most of the mental health problems (e.g., somatisation, mild mental health disorders, behaviour problems) can be managed through simple, measures that target the entire displaced community, for example:

1. Aiding people to resume normal cultural practices

Every individual, family, and group has some social practices or rituals they engage in to heal themselves. For some, it is prayer. For others, it may be getting together with others to eat, dance, or sing. Sometimes healing for the society as a whole can begin through national holidays, the media, or installing leaders who will bring peace.

In humanitarian emergency situations, individuals, families, and communities may lose touch with the rituals they rely on to cope with hardship and tragedy of everyday life. Displaced people should have the freedom and opportunity to practice their customs, beliefs, and traditions according to their culture. Mental health programmes working through cultural leaders can build on the strengths of a community by taking active steps to reintroduce cultural practices into everyday life. For many affected people, this type of support may be enough to help them cope with any mental or emotional problems they are having.

2. Educating the community

When people are educated about health and disease they are able to take better care of themselves. So, by making people aware of mental health problems, they are able to tolerate their negative reactions to the emergency situation and cope better. In addition, the stigma of seeking mental health care will be overcome and they will be more willing to accept services. Programmes can spread information in several ways:

- through the media, by putting educational programmes on the radio or in the newspapers
- by making leaders from the affected community aware of common mental health problems
- by giving additional training on mental health to health workers and social workers
- by training local staff about mental health problems so that they can educate other support groups

3. Linking people with other services

Displaced people often need food, shelter, and health care, as well as non-emergency social services. For the affected population to fully benefit from a mental health program, relief workers must pay attention to the people's material needs as well as their emotional needs. Linking people with other essential services can help them take the first steps toward regaining their health and normal routines.

In addition, relief agencies and the host community should help the affected people find opportunities for meaningful work. This includes involving the displaced people in delivering relief services as much as possible.

The following table identifies some of the needs of displaced people. Even though some needs may be of a non-emergency nature, meeting these non-emergency needs will help them cope better with their situation.

Summary

This chapter is aimed at providing guidance to the community supplying aid to address the psycho-social and mental health needs of populations exposed to crisis events. The humanitarian community's challenge is supporting the community within the displacement camp or damaged areas and shouldering the burden of reintegration and eventual reconciliation. The humanitarian agencies and organisations usually have limited resources and are faced with disaster affected populations whose needs are overwhelming. Unfortunately, many of the psychosocial and mental health interventions promoted over the last three decades are not based on sound scientific evidence or best practices. This is partly a result of the lack of appropriate assessment tools for evaluating the impact of these programmes as well as a result of a lack of evaluation standards. What is emerging however is that psycho-social and mental health services need to be provided through both primary health care and community settings. It is encouraging that more evidence-based studies are emerging that can direct programme design, monitoring and evaluation and that can serve as future templates with which psychosocial and mental health indices can be developed and tested.
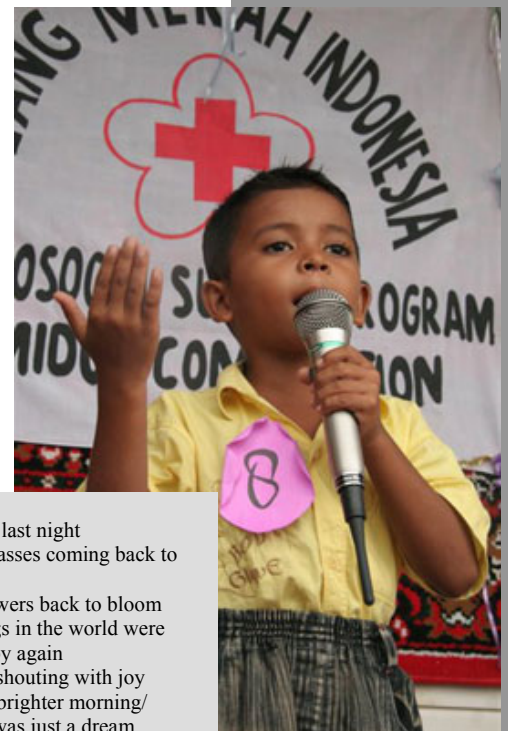
"I had a dream last night
I saw all the grasses coming back to green
And all the flowers back to bloom
All living things in the world were becoming happy again
Everyone was shouting with joy
To welcome a brighter morning/
But all of this was just a dream
That will never come true
All the disasters,
The earthquake and tsunami
They have destroyed my dreams
Will my dreams ever come true again?"

One of hundreds of great singers who have performed in Pelang Merah Indonesia.

Epidemiology and surveillance

Treguine Refugee Camp, Chad, November 2006
684 children were vaccinated and 1302 women were vaccinated against tetanus.International Federation

Epidemiology and surveillance

Description

This chapter provides an overview of the key epidemiological principles and the epidemiological tools needed in managing emergency public health programmes. The main goals are to reduce morbidity and mortality among disaster affected and displaced populations.

Objectives

- To provide a basic understanding of key epidemiological principles and terminology;
- To develop skills for defining and calculating indicators;
- To describe standard methods for conducting needs assessment;
- To define the steps for setting up a surveillance system for emergency situations;
- To describe the main principles and practical methods for conducting a population survey;
- To identify key steps in investigating disease epidemics;
- To develop skills in analysing and presenting epidemiological information.

Key competencies

- To recognise the main constraints in applying epidemiological methods to emergency situations;
- To calculate key indicators of the health status of a population;
- To plan a rapid needs assessment;
- To set up a surveillance system for emergency situations;
- To conduct a population survey using the appropriate sampling and analysis methods;
- To investigate an epidemic and apply findings to an epidemic control programme;
- To analyse and present epidemiological data in a logical manner for use in programme management.

Basic principles of epidemiology in emergencies

Epidemiology is the study of the causes and distribution of disease in human populations. An epidemiological approach helps planners to focus on the main problems of a *community* rather than of *individual patients* and to identify measures for improving the health of the community as a whole. Commonly used terms in epidemiology are defined in the glossary at the end of this chapter.

Epidemiology can increase the general understanding about a disease and particularly how it is transmitted even when the cause is unknown. In epidemiology, the assumption is that diseases do not occur randomly, but follow predictable patterns that can be studied and expressed in terms of

what, who, where, when, how, why, and what next.

Epidemiology and surveillance

6

The goal of epidemiology is to identify subgroups of the population who are at a higher risk of disease than usual and who will benefit the most from disease specific interventions. Epidemiological information can be used to develop prevention strategies according to:

- *Time* (peaks at a particular season);
- *Place* (limited to specific geographic areas); or
- *Person* (groups at risk).

In emergencies, epidemiology has three elements:

- Descriptive Epidemiology determines the distribution of a disease among displaced populations. It describes the health problem, its frequency, those affected, where, and when. The events of interest are defined in terms of the time period, the place and the population at risk.
  *Examples***:** Monitoring the health status of a population to detect cholera cases, such as, by age, sex, location, water source and duration of stay in a dispersed population or camps.
  Conducting a nutritional survey to determine the prevalence of acute malnutrition among children under five.

- Analytical epidemiology compares those who are ill with those who are not in order to identify the risk of disease or protective factors (determinant of a disease). It examines how the event (illness, death, malnutrition, injury) is caused (e.g. environmental and behavioural factors) and why it is continuing. Standard mathematical and statistical procedures are used.
  *Example***:** Investigating an outbreak of an unknown disease in a displaced population settlement.

- Evaluation epidemiology examines the relevance, effectiveness and impact of different programme activities in relation to the health of the affected populations.
  *Example***:** Evaluating a malaria control programme for displaced populations.

Role of epidemiology in emergencies

Epidemiology in emergencies goes beyond simply understanding how diseases are contracted and spread. Humanitarian relief programmes can be managed better if decision-making is based on epidemiological findings. Relief workers need training to help them collect more reliable information and use it to improve health care for the displaced population. During the emergency response, applied epidemiology can be used to define the long-term needs of communities. Community capacity to respond to emergencies can be strengthened if members are engaged to learn 'shoe-leather' epidemiology including how to map their villages, conduct reliable needs assessments and identify groups who are at a particularly high risk from disease. Developing such skills can also be highly valuable for communities long after emergencies have been resolved.

Objectives of epidemiology in emergencies include:

- Identifying the priority health problems in the affected community;
- Determining the extent of disease existing within a community;
- Identifying the causes of disease and the risk factors;
- Determining the priority health interventions;
- Determining the extent of damage and the capacity of the local infrastructure;
- Monitoring health trends of the community;
- Evaluating the impact of health programmes.

Epidemiology has many uses in emergency situations, including:

- Rapid needs assessment;
- Demographic studies determining the population size and structure of affected communities in camp settings or dispersed within a host population;
- Population surveys for determining health status (death rates, incidence/prevalence of disease, nutrition and immunisation status) and assessing programme coverage;
- Investigating a disease outbreak;
- Public health surveillance and management information system;
- Programme monitoring and evaluation.

Constraints of epidemiology in emergencies

Constraints in using epidemiology in emergencies include:

- Poor understanding of basic epidemiological principles and measurement techniques;
- Rapid turnover of skilled staff;
- Limited access to a significant fraction of the affected population due to chaos or insecurity;
- Limited resources for processing information;
- Difficulty in estimating the population size;
- Survey samples might not represent all the affected population;
- Difficulty in investigating long-term needs of an affected population;
- Lack of support to undertake assessments and address needs of Internally Displaced Persons (IDPs).
- **Note:** governments might be part of a conflict and are thus less likely to care for the IDPs while the original mandate of UNHCR does not cover IDPs.

Key epidemiological indicators

Indicators are measures that reflect the state of a population in terms of health, socio-economic status etc. They might also reflect the process and outcome of existing services. In humanitarian emergencies, indicators are useful for measuring and describing the effects of a disaster on a population and for providing baseline measurements. Later, these measurements will help determine the outcome of the relief response.

Indicators may be defined from surveys or an existing health information system. They might be quantitative or qualitative in nature. Quantitative indicators are easily calculated from numeric information such as the total number of people, the number of people according to age and sex etc.

Examples of quantitative indicators include:

- **Incidence**—the number of cases or events that occur within a defined population that is divided by the total population in which the cases or events occurred in a specific period e.g. the incidence of measles among children.
- **Prevalence**—the proportion of the population with a particular condition that is divided by the total number of persons at risk for the condition during that period e.g. the prevalence of HIV/AIDS in a population.
- **Morbidity rate**—all persons in the population under consideration e.g. belonging to a specific gender or age-group who become clinically ill during the specific period.
- **Mortality rate**—the number of deaths occurring in a population in a specific period (usually a year) divided by the number of persons at risk of dying during that period e.g., mortality rate of infants during their first year of life.

Qualitative indicators that measure people's attitudes and knowledge are more difficult to measure. These indicators might be critical in explaining unexpected values of quantitative indicators. Social processes influencing health outcomes might also be elucidated by using qualitative indicators. Examples of qualitative indicators include:

- **Awareness of the value of immunisation**—low awareness may explain the high incidence of measles in a population living within five kilometres from a health facility;
- **Adherence to preventive interventions against HIV/AIDS**—poor compliance from youths in preventive interventions (e.g.; A lack of understanding about the "Abstinence, Be Faithful, Use a Condom" (ABC) programme)) might explain the increasing prevalence of HIV/AIDS in a population;
- **Equity in distribution of resources**—inequitable distribution of food might explain the increased mortality detected in a subgroup of a population;
- **Barriers to seeking treatment for malaria**—barriers to seeking treatment such as unaffordable health services, might explain an increase in malaria-specific mortality.

The following qualitative indicators are commonly used for assessing programme outcomes:

- **Access**: the proportion of the target population that can use the service or facility;
- **Coverage**: the proportion of the target population that has received service;
- **Quality of services**: the actual services received compared with the standards and guidelines;
- **Availability**: amount of services compared with total target population. This should be based on minimum standard requirements.

The following table summarises the quantitative and qualitative indicators that can be used to evaluate an emergency health programme's process and outcome.

Table 6-1: Quantitative and qualitative indicators for emergency health programmes

Indicator	Examples
Health policy (might be difficult to measure)	▪ Degree of political commitment ▪ Adherence to agreed/national case definitions and treatment protocols ▪ Level of community participation ▪ Degree of inter-sector collaboration ▪ Equity in distribution of resources ▪ Inter-agency co-ordination ▪ Adherence to universal precautions against HIV/AIDS ▪ Adherence to minimum standards of the Sphere Project
Demographic profile	Estimated size and structure of displaced population: ▪ Age and sex composition ▪ Migration patterns (proportion moving in and out) ▪ Proportion of high-risk groups ▪ Ratio to local resident population
Health status	▪ Rate and causes of death (crude, infant, under fives, maternal) ▪ Incidence and prevalence of common disease ▪ Rate of under-five malnutrition
Programme inputs	Availability of the following resources: ▪ Facilities and equipment (health centre, beds) ▪ Staff (beneficiary population, local, expatriate) ▪ Basic supplies (food, shelter material, domestic equipment) ▪ Energy sources (fuel, charcoal) ▪ Transport

Epidemiology and surveillance

Indicator	Examples
Programme process	Access, coverage, and quality of the following services: ▪ General food distribution and supplementary feeding ▪ Potable water supply ▪ Latrine construction ▪ Immunisation ▪ Reproductive Health ▪ Health services at all levels i.e. community health, peripheral clinics/second and tertiary facilities

Estimating population size

A reliable estimate of the total population size including age and sex distribution is important for the following reasons:

▪ To be aware of the true population that is at risk of death and disease including the host population;

▪ To have a census for planning and political reasons (required by host authorities, donors, media, etc.);

▪ To estimate the amount of basic needs required (food, water, shelter, health resources);

▪ To draw budgets for relief programmes and estimate needs in recovery phase;

▪ To calculate the value of indicators for programme monitoring and evaluation;

▪ To plan long-term solutions including contingencies and future mitigation.

Different methods for estimation

Estimates of the total population, the population of children aged less than five years or women of child-bearing age etc. represent **critical denominators** that are required for calculating indicators. The most critical denominator is the estimate of the *total population*. This estimate must be **valid** since it provides the basis for all planning in humanitarian programmes. These estimates might exist from a prior registration exercise or census. However, they might be grossly unreliable e.g. over-stated or understated especially during disasters with major displacements. One might either accept the best available data or apply current epidemiological knowledge about the effects of similar disaster situations on the population structure.

The ideal method for estimating the population size is by a census or a registration system, which can only be carried out several weeks or months after the relief operation has been established.

Acute emergency situations

This can be most challenging since many decisions have to be made on incomplete, inconclusive and inaccurate information and data. It requires very experienced professionals to lead the operations.

Epidemiological procedures can be used to get better estimates of the population size and structure. For better estimation of the population size during the acute emergency phase, the following surveys or sampling methods can be used for the rapid assessment:

▪ Water Usage: Determine the total amount of water the whole population in the dispersed population/camps consumes in one day. Then, interview a sample of people at their household or water collecting point to estimate the average amount of water used by each individual:

If 200,000 litres of water are consumed in one day and individual water usage is

estimated as 20 L/person/day, the total population in the dispersed population/camps should be 200,000/20 = 10,000 people.

Note: The total food distributed and individual food baskets may be used to estimate the total population in the same way as water usage. However, these estimates should be interpreted carefully since food rations may be collected for sale or families may collect more than one ration.

- Nutrition Screening: Screen and count a specified fraction of children under five years. In emergencies, the number of women, children and elderly is very high. If birth records are not available, use the cut-off height for all children aged less than five years as 110 cm. Assuming that the under-five children make up about 20% of the total population, multiply the estimated fraction of under-fives by five to estimate the fraction of the total population for the total population estimate.
Note: Mass immunisation campaigns can be used to estimate the population size in a similar manner assuming that the immunisation coverage is 90% or more.

- Aerial Mapping: Maps are useful tools for gathering additional information. A map can be used for sampling people from various ethnic and socio-economic groups for interviews or for sampling households for rapid surveys and for planning and evaluating programmes. If no maps exist, one can either take a photograph of the settlements while flying or manually sketch maps to locate the affected population. The population might either be settled in its own camps or integrated within the host population. Begin with a tour around the boundary of the location(s) to define its approximate shape and the maximum and minimum length and width. The key landmarks (e.g. river, lake), the roads and any Primary Health Care facilities around the catchment area should be included in the map (see Figure 6-1 below). If possible, the varying population density within the location(s) should be shown. Make a rough estimate of the population size using this information or continue to step 4. **Note:** Aerial mapping is indeed useful, but in floods, where many landmarks are hard to find, A Global Positioning System (GPS) is convenient. However, without appropriate scaled maps and their coordinates, it will not work. Such maps and pilot charts are used by military and civil aviation.

Figure 6-1: Map of catchment area
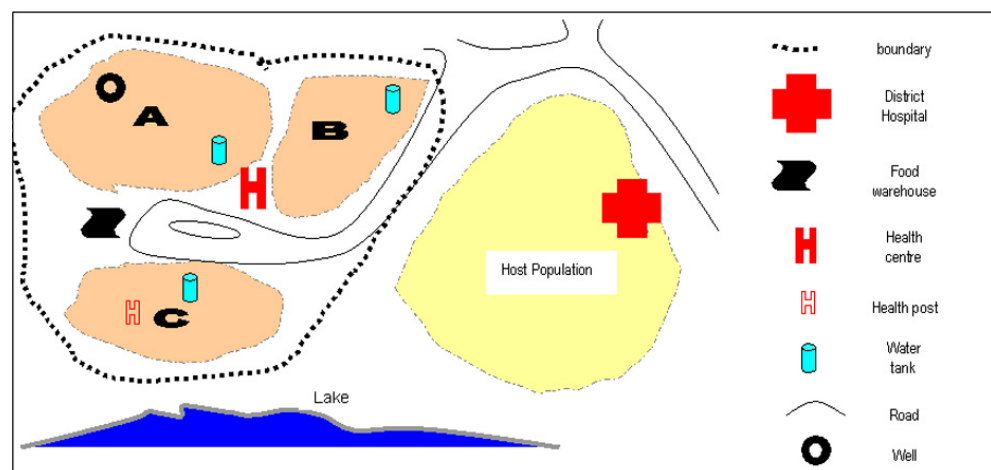
Note: The legends (symbols and colours representing structures and boundaries) should be consistent and recognisable for all maps. Maps of sub-catchment areas might also be drawn to show varying target groups for different primary health care services.

- **Determining the population's size and composition**: Divide the entire map into sections containing approximately equal numbers of households. To estimate the number of households in the entire location, count the number of households (shelters or cooking fires) in a typical section and multiply this by the total number of sections. Carry out convenience sampling and select a reasonable number of households (e.g.,

fifty) that can be easily reached. Record the number of persons living in each household including their age and sex breakdown. Calculate the average number of persons per household and multiply this by the total number of households. The age-sex pyramid can be plotted to show the estimated population structure (see data analysis section for an example an of age-sex pyramid).

Note: The above-mentioned **convenience** (or non-probability) sampling is useful for making crude estimates of the population size/composition and possibly for identifying the immediate health needs during the rapid assessment. Results from convenience sampling are biased and not representative of the entire population. They cannot be used for comparison with results from other surveys. Where possible, probability sampling surveys should be organised as soon as possible to obtain more reliable results. See the section on population surveys for details about probability sampling methods.

Post-emergency situations

To estimate population size during post-emergency situations, other techniques can be used if the information from census or registration exercises is unreliable:

- **Participatory mapping** of the catchment area can be done by inviting a group of the affected population to sketch a map of the entire community on the ground or on large paper. They should first be asked to define the physical boundaries of the location of the affected community (see Figure 6-1 above) and the location of all key landmarks (e.g. rivers or lakes, roads, health facilities/services, water pumps, cemeteries etc). Distances should be shown as accurately as possible. They should be asked to identify where different ethnic communities and the most vulnerable group(s) (e.g. the poorest or most malnourished) are located in the map of the catchment area.

  Note: The above approach can easily capture the population in camp settings. However, when the affected community is dispersed within a host population, it is important to invite members from the disaster affected as well as the host population to either separately or jointly participate in the mapping exercise depending on the level of hostility between the two groups.

- **Household registration**: If the information from the census or registration exercises is unreliable or more information is required as dispersed population/camps services are set up, household and dispersed population/camps registers should be developed. Reviewing existing administrative records or interviewing key persons can help in designing the registers and in determining the target groups for emergency health services. Community health workers can be trained to visit all households and gather the required information e.g. record the households on the map and register each household member's personal details (name, age, sex) and any existing risk factor (malnutrition, illness and disability). Household registers

*International Federation refugee camp
Photo: International Federation*

can later be used by health workers to locate vulnerable individuals who are most at risk

of disease or death and to target them for specific primary health care interventions. Dispersed population/camps registers can be developed from summaries of household registers. They are useful for identifying the priority health needs of the population in the dispersed population/camps. Examples of dispersed population/camps and household registers are shown in the following table.

Table 6-2: Camp register

Camp	Popu-lation	# House-holds	Camp leader	CHW volunteer	Health problems		Access to health facility	Available transport	Remarks
					Priority	Addressed			
Omega	1000	150	Jacob	Sarah	sanitation Immuni-sation	no yes	10 km	Donkey carts	Water source not reliable
Delta	1075	210	Noah	Adam	Immuni-sation Malnu-trition	yes no	5 km	none	Easily floods in rainy season

Table 6-3: Community health worker household register

Household ID: 02/90/12
Head of household: Aladdin Ali

Registration date: 23/7/68
Prior occupation: Teacher
Camp/zone: Omega/blue

Relation to HoH	Name	DOB/Age	Sex	Health problem	Date of death	Migration	Risk factor	Remarks
wife	Delilah	17	F	pregnant			local beliefs	Poor access to formal health care, low literacy
son	Sinbad	3 months	M	diarrhoea			not breastfeeding	
father	Ali Baba	58	M	TB	20/6/68			

Caution: Keely et al. (2001) cite several potential reasons for the overestimation of the number of beneficiaries.[19] These include hiding people who are not Internally Displaces Persons (IDPs) or legitimate refugees, registering more than once to increase food rations, under-reporting of out-migrations and deaths and when members of the local population can attempt to register to access services provided to IDPs or refugees. On the other hand, under-estimations might result if IDPs or refugees who settle outside camps in the local population are hard to find and count, or if persons who are sick or malnourished do not access services that are being used to count beneficiaries.

Calculating rates, ratios and proportions

The most readily available data is usually in the form of absolute numbers (e.g. the total number of measles cases, the total number of diarrhoea cases). Absolute numbers can be used to report on the health of a specific population in a confined area over a short period. However, they cannot be used to compare events within the same population between population groups of different sizes or at different locations because absolute numbers can lead to invalid conclusions. For example, no conclusion can be drawn from reports of twenty-one deaths in Refugee Camp A and fifteen deaths in Refugee Camp B. To understand the significance of these reports and compare the death toll in the two camps, the frequency of deaths must be expressed as fractions such as **rates**, **ratios**, or **proportions** (percentages). These fractions contain a numerator and the best estimated population size as the denominator.

$$\text{Rate} = x/y \ \times \ \text{factor}$$

This formula expresses the likelihood that a particular event, case, or episode (*x*) will occur in a specified period of time among a population at risk (*y*). Examples of rates include the crude mortality rate, cause-specific mortality rate and incidence rate. These are described in greater detail below.

- ▪ **The Crude Mortality Rate** is the total number of deaths per day and the number of under-five deaths. As with determining population data, counting the number of deaths in an emergency is difficult. It is even harder to count events among beneficiary populations that are not living in camps. Deaths often do not happen at or get reported to service sites such as health facilities or feeding centres. As a result, two additional approaches that can be used to estimate the number of deaths include retrospective mortality surveys and community-based surveillance. Standardised methods for retrospective mortality surveys (such as SMART) are being developed.[11] Community-based methods include having volunteers and making home visits to ask about recent deaths, hiring grave watchers to count the number of burials or counting the number of shrouds or other burial material distributed.[11]

Note: Checchi and Roberts provide an easy to read description of both retrospective mortality surveys and community-based mortality surveillance in 'Interpreting and using mortality data in humanitarian emergencies: a primer for non-epidemiologists.' This paper can be downloaded from the Humanitarian Practice Network. It provides information on sample sizes, sampling methods, question procedures and interpretation of retrospective mortality surveys. These surveys provide relatively good quality information about past mortality experience. However, they should be led only by very experienced people.

For prospective, community-based surveillance, Checchi and Roberts recommend a system whereby trained home visitors go to homes within assigned sectors daily or weekly. During their visits, the home visitors inquire about deaths (day of death, age, gender). Home visitors can also use this opportunity to help update information about the size of the beneficiary population (total size, under-five count and eventually age and gender distribution). This system requires substantial supervision and a significant number of home visitors, however. The authors recommend at least one home visitor for every 1,000 beneficiaries.

Checchi and Roberts site potential problems with an alternative community-based method: grave-watchers hired to watch burials sites twenty-four hours a day. The potential problems they cite include the difficulty distinguishing new from old graves especially after rain, incomplete knowledge of all burial sites (e.g. some newborn deaths might be buried within or near shelters) and difficulty distinguishing graves of members of the local population from those of the refugee population.[21]

The notes below show how to calculate these rates assuming there is an existing surveillance system that documents the number of deaths occurring after identifying the total number of the population at risk of death. Both numbers are needed to make the calculation.

Note: Retrospective surveys are a good source of information for the number of deaths and the population at risk of death. Experienced persons are needed, however, to calculate the precision of the rates derived from surveys.

Crude Mortality Rate (CMR): The rate of death in the entire beneficiary population (includes both sexes and all ages).[1] The most commonly used expression of CMR is the number of deaths per day per 10,000 persons in the population. The population size most commonly used in the calculation is the estimated population size at the mid-point of the time period---the time period that the number of deaths represent (say the number of deaths during a month or a week or a day). The formula for this calculation is provided below:

$$\frac{\textit{Total number of deaths during the time period}}{\textit{Total population at mid-point of time period that is at risk of death}} \quad X \quad \frac{\textit{10,000}}{\textit{\# of days in time period}} \quad = \quad \textit{\# deaths/10,000 persons/day}$$

Under-5 mortality rate (U5MR): The rate of death among children below 5 years of age in the beneficiary population.[1] This is a type of age-specific mortality rate. As with the CMR, this rate is most commonly presented as the number of deaths (among < 5s) per 10,000 persons per day. The formula for this calculation is provided below:

$$\frac{\textit{Total number of deaths in children < 5 years of age during the time period}}{\textit{Total number of children less than five years in the population at mid-point of time period that is at risk of death}} \quad X \quad \frac{\textit{10,000}}{\textit{\# of days in time period}} \quad = \quad \textit{\# deaths/10,000 persons/day}$$

Crude Mortality Rate and the Under-Five Mortality Rate (U5MR) are typically calculated on a population level; that is, the total number of deaths in the population is counted (surveillance) or estimated (surveys). In contrast to CMR and U5MR, the numerators for other key rates of mortality and morbidity are often based on information collected only at service sites such as health facilities, cholera treatment centres and feeding centres. This is because information about the trends in rates (as opposed to population-based rates) is often sufficient for disease control; obtaining rates on a population-basis for specific causes of death and disease is costly to do on a regular basis. The following rates described below are considered key rates for health information systems to collect and utilise.

▪ **Cause-specific mortality rates**: This rate looks at the number of deaths due to a specific disease or other cause during a specified time period. The rate is reported as the number of deaths due to a specific cause per 1,000 individuals in the population during the time period (weekly during emergency or monthly in the post-emergency phase). Daily reporting should be considered during an epidemic.[17]

Note: Calculate rates for the causes of death requested by the lead health authority and include on standard mortality reporting forms. The Sphere handbook includes sample weekly mortality surveillance reporting forms that can be used until a standard is defined by the lead health authority.[1] Any enquiry on specific deaths needs to include diseases of epidemic potential such as acute watery diarrhoea, dysentery, cholera, measles, malaria and meningitis. Other causes of death typically requested in many emergencies include pneumonia, injury as well as maternal and neonatal illnesses that kill scores worldwide (between 7 to 10 million per year depending on sources). This information is used to select, monitor and evaluate health interventions.

Example: The significance of twenty-one deaths in Camp A and eighteen deaths in Camp B depends on the period that they occurred and the size of the population at risk. Assuming they all occurred over a seven-day period, the crude death rate can be calculated for each camp based on the estimated total population—A (50,000 people) and B (5,000 people) as follows:

Crude mortality rate (CMR)	$=$	$\dfrac{\text{Number of deaths} \times \text{factor}}{\text{Total mid-interval population} \times \text{time period}}$		
Crude mortality rate for population A	$=$	$\dfrac{21 \times 10{,}000}{50{,}000 \times 7}$	$=$	0.6 deaths/10,000/day (indicates a stable situation)
Crude mortality rate for Population B	$=$	$\dfrac{15 \times 10{,}000}{5{,}000 \times 7}$	$=$	4.3 deaths per 10,000 per day (indicates a critical situation)

Note: A **factor** of 100, 1000, or 10,000 can be used to convert calculated rates into whole numbers. During the initial phase of the emergency, a factor of 10,000 is used for calculating **daily** death rates in order to detect sudden changes. A crude death rate of one death/10,000/day indicates an acute emergency phase. The post emergency phase begins once the Crude Mortality Rate (CMR) drops below one death/10,000/day. Thereafter, death rates may be analysed once a month using a factor of 1,000 to calculate **monthly** death rates.

To convert CMR expressed as *deaths/10,000/day* into *deaths/1000/month*, divide the daily CMR by ten and then by the total days in a month. From the above example:

4.3 deaths/10,000/day	$=$	$\dfrac{4.3}{10 \times 30}$	$=$	0.014 deaths/1,000/month

- **Incidence rates for common causes of mortality and morbidity** is the number of new occurrences of an event included on standard morbidity reporting forms (disease, injury, malnutrition, scabies etc.) during a time period in a population at risk for the event.

Incidence rates: The Sphere handbook includes sample weekly morbidity surveillance reporting forms that can be used until case reporting is standardised by the lead health authority.[1] The specified events may include diseases of epidemic potential such as acute watery diarrhoea, dysentery, cholera, measles, malaria and meningitis. Other events typically requested include pneumonia, injury, skin diseases, sexually transmitted infections including AIDS, and eye diseases. This information is used to select, monitor and evaluate health interventions. The *weekly* reporting formula for this calculation is provided below:

$\dfrac{\textit{Total number of event during the week}}{\textit{Total population at mid-point of the week that is at risk of having the event}}$	$\times$	*1,000*	$=$ *# events/1,000 persons/week*[*]

[*]*Meningococcal meningitis is usually calculated per 100,000 persons/week*

- **Case-Fatality Rates (CFR)** is the proportion of persons with a disease in a specified period that dies from the disease. It is reported as a percent such as 'the case-fatality rate of persons with cholera in the last week was 35%'.

CFR: If cases on a disease arrive at a health facility shortly after the onset of the disease, this rate is a reflection of the quality of care provided in health facilities. Otherwise, this rate is a reflection of the effectiveness of outbreak control measures. The maximum acceptable CFRs are as follows: cholera (1%); Shihe formulgella dysentery (1%); typhoid (1%); meningococcal meningitis (varies; up to 20% during outbreaks).[1] Ta used to calculate the weekly case fatality rate is provided below.

$$\frac{\textit{Total number of people dying from the disease during the last week}}{\textit{Total number of people who had the disease during the last week}} \times 100 = X\%$$

- **Health facility utilisation rate** looks at the number of out-patient visits per person. The rate is converted to an annual rate even if the time period during which the information is collected on visits is less (usually one week).

Health facility utilisation rate: 'Among displaced populations, an average of 4.0 new consultations/per person/per year may be expected. If the rate is lower than expected, it may indicate inadequate access to health facilities. If the rate is higher, it may suggest over-utilisation due to a specific public health problem (e.g., infectious disease outbreak), or under-estimation of the target population (pg. 268).'[1] While it is recommended that new visits be counted separately from old visits, it is often difficult to do; during an emergency the total number of visits is typically counted. The formula used to calculate this rate on a weekly basis is provided below.

$$\frac{\textit{Total number of visit in one week}}{\textit{Total population at mid-point of the week}} \times 52 \text{ weeks} = \textit{\# visits/persons/year}$$

- **Consultation rates per clinician per day:** This looks at the total number of patients seen by each clinician per day on average.[1] No effort is made here to distinguish new from repeat consultations.

Number of consultations per clinician per day: The Sphere standard is that clinicians are not required to regularly consult more than fifty out-patients per day. The decision to hire additional clinical staff should be triggered if this threshold is regularly exceeded. Clinical staff is defined as a 'formally trained clinical provider, such as a physician, nurse, clinical officer or medical assistant (page 267).'[1] Note that Primary Health Care workers (non-physicians) can often see more patients than physicians because physicians tend to manage more complicated cases. The formula used to calculate this rate on a weekly basis is provided below.

$\dfrac{\textit{Total number of patient in one week}}{\textit{Number of FTE}^* \textit{ clinicians in health facility}}$	$\div$	*Number of days health facility open per week*	$=$	*# consultations/ clinician/day*

* FTE = Full-Time Equivalent. This number represents full-time staffing. Consider a clinic that is open six days per week. If two persons each work all day three days per week, this is one full-time equivalent. If three persons each work all day six days per week, and one person works ½ day six days per week, this is 3.5 full time equivalents. If one person works ½ day six days per week, this is 0.5 full-time equivalents.

Ratio = x/y

This formula expresses a relationship between a numerator (x) and a denominator (y), where x need not be part of y.

Example: If the estimated size of the displaced population is 20,000 with 8,000 males and 12,000 females:

Then, the ratio of males to females	$\dfrac{\textit{Total number of males}}{\textit{Total number of females}}$	$=$	$\dfrac{8{,}000}{12{,}000}$	$=$	2:3

This ratio is better interpreted by dividing each side of the equation by the value on the left side i.e.:

Male: Female = 2/2:3/2 = 1:1.5

Proportion = x/y

This formula expresses the relationship between a numerator (x) and a denominator (y), where x *is* part of y.

- **Proportionate mortality** is not a rate by definition. Proportionate mortality looks at the proportion of all deaths in a population during the period due to a certain cause (the denominator is the same as for the Crude Mortality Rate). For example, during one week period, we might find that cholera was responsible for 70% of all deaths in that week. This information is used to select, monitor and evaluate health interventions.

Example 1: If the 21 deaths in camp A were of patients diagnosed with malaria during the same month:

Proportional mortality (%)from malaria in hospitals	=	$\dfrac{\text{Number of deaths due to a certain disease x 100}}{\text{Total deaths during that period}}$	x 100 =	$\dfrac{21 \times 100}{100}$	=	21%

Example 2: **Coverage** is also calculated as a proportion as follows:

	=	$\dfrac{\text{No. of beneficiaries of a service}}{\text{Total target population}}$	x 100
Immunisation (%) Coverage	=	$\dfrac{\text{(No. of children aged 12-23 months who got immunised)}}{\text{(Total number of children aged 12-23 months)}}$	

Interpretation of epidemiological data

The main uses of the Crude Mortality Rate and Under-Five Mortality Rate (U5MR) are to

(1) Decide if humanitarian assistance is needed;

(2) Decide if humanitarian assistance is adequate or should change; and

(3) Advocacy.

- **Need for humanitarian assistance**: Mortality rates that are double the expected baseline levels are an indicator of significant excess mortality and a justification for initiation or continuation of humanitarian assistance. We recommend the use of Sphere standard thresholds for initiation/continuation of humanitarian assistance as these reflect the doubling of expected baseline levels. The Sphere thresholds are provided in Table below. When baseline rates are unknown, a Crude Mortality Rate (CMR) of >1.0/10,000/day or U5MR of >2.0/10,000/day are used.

Table 6.4. Mortality thresholds used to define emergency situations[11].

Agencies	Assumed baseline	Emergency thresholds
Centres for Disease Control, Médecins Sans Frontièrs Epicentre, Academia	Fixed at: CMR: 0.5 per 10,000 per day U5MR: 1 per 10,000 per day	Emergency if: CMR ≥1 per 10,000 per day U5MR ≥ 2 per 10,000 per day
UNHCR	Fixed at: CMR: 0.5 per 10,000 per day U5MR: 1 per 10,000 per day	CMR > 1 per 10,000 per day: 'very serious' CMR > 2 per 10,000 per day: 'out of control' CMR > 5 per 10,000 per day: 'major catastrophe' (double for U5MR thresholds)
Sphere project	Context-specific CMR (U5MR): Sub-Saharan Africa: 0.44 (1.14) Latin America: 0.16 (0.19) South Asia: 0.25 (0.59) Eastern Europe, Former Soviet Union: 0.30 (0.20) Unknown baseline: 0.5 (1.0)	Emergency if CMR (U5MR): Sub-Saharan Africa: 0.9 (2.3) Latin America: 0.3 (0.4) South Asia: 0.5 (1.2) Eastern Europe, Former Soviet Union: 0.6 (0.4) Unknown baseline: 1.0 (2.0)

▪ **Need to change humanitarian interventions**: Sites with ongoing CMR or U5MR at emergency level should consider re-prioritizing the health interventions provided (see Standard 1 for Health Systems and Infrastructure). Use available information about causes and age of deaths to decide how current health interventions need to change, or if other interventions such as food distribution, supplementary feeding, water and sanitation need improving.

▪ **Advocacy**: When the needs of populations in crisis are being ignored by media and political leaders, mortality studies can be used to raise awareness and apply pressure for adequate humanitarian assistance.[11]

However, before disseminating or using any assessment data, its quality should be examined for potential biases. Quality of mortality data can vary depending on whether surveillance or surveys are the source. Because health needs assessments are done rapidly, the analysis or conclusions might not be accurate. Triangulation might be performed to improve the quality of findings as described in the table below.

Triangulation: Confidence in the data collected can be improved by cross-checking in various ways: (1) by different sources, (2) about different persons and (3) using different methods.[7]

▪ By including persons with diverse perspectives and backgrounds on the assessment team, the potential bias that the information exclusively represents a limited point of view (e.g., views of one technical area or gender, outsider perspective only, etc.) can be overcome.

▪ By collecting data about and from persons with diverse characteristics (gender, leadership role, service provider, beneficiaries, ethnicity etc.) the bias that the information only represents the interests of a narrow group of people can be overcome.

▪ By using several data collection methods (review of secondary information, interviews with individuals, group discussions, observations) the biases that come with particular methods can be overcome. For example, it might be expected that people might change their behaviour during observation; if we only use observation we may never learn about what people do when not observed. If we only use group discussions, important but sensitive information might not be shared. If we rely only on interviews, we may miss important but complex information that can be picked up by observation.

There are specific guides addressing issues of bias, such as the one by Checchi and Roberts discussed previously in this chapter, which is available for download from the Humanitarian Practice Network.[21]

Judging the quality of mortality surveillance data should only be used by persons with significant experience and expertise should lead or conduct mortality and those who are able to consider the following when interpreting survey data:

▪ The Crude Mortality Rate (CMR) and Under-Five Mortality Rate (U5MR) calculations are very sensitive to the number used to estimate the population size (denominator). When interpreting the data, judge whether or not the population size is likely to be over- or under-estimated. Analyze how this might affect the true rates.

▪ With small populations, CMR, U5MR and other indicators are less reliable and 'jump' within days. To judge the situation requires experience and a great deal of common sense.

▪ Some deaths can be missed by any surveillance system especially if death reports are limited to what is collected at service sites. Similarly, a single death can be recorded twice if several sources of data are used to count deaths. When interpreting the data, consider the sources of the death reports (e.g. facility registers only, community-based surveillance, or both) and judge whether or not the number of deaths is likely to be an over- or under-estimate and how this might affect the true rates.

Rapid health assessment

Objectives of rapid health needs assessment

Key decisions in a health emergency, such as the need for intervention and the type and size of the intervention, must be made rapidly. Unfortunately, precise and reliable data often require weeks to organise, collect and analyse. The methods used are more complex. This means that some decisions must be made using less precise and less reliable data. The assessment should be started within a short time frame, ideally within the first three days after the event.

A rapid needs assessment is carried out to determine:

- The magnitude of the emergency and population size affected;
- The vulnerable population groups with high risk of death or disease;
- What are the present health priorities and potential public health problems;
- Availability of food, water and shelter, clinics and hospitals;
- Environmental conditions;
- What the government or military is doing, what the plans are;
- Presence, plans and activities of international or local organisations;
- Whether or not external support or intervention is needed; and
- Critical upcoming hazards, like winter conditions.

Preparing for rapid health needs assessment

Adequate preparations are needed before a rapid assessment can be made. This includes the following steps:

1. Before the field assessment, collect background information about the emergency situation's geographic location, the population affected and any political factors. Also collect the pre-emergency health data and information on the existing health system. Try to confirm all information with the UN, the host government and other NGOs;

2. Coordinate with other organisations, government and military and assessments;

3. If a multidisciplinary assessment team cannot be recruited locally, get the proper authorisation (work permits, travel permits, vaccinations etc.) for additional personnel from outside the country. Local representation is absolutely essential and teams made up of expatriates must be avoided;

4. The assessment team should then plan the field assessment as follows:
   - Define the terms of reference and the objectives of the assessment;
   - Based on the nature of the emergency, determine the priorities to be considered;
   - Select how and in what order the information will be gathered. If existing assessment checklists are to be used, coordinate with other agencies. They must be carefully reviewed and adapted to the local situation. All should use the same checklists;
   - Design or adapt the forms for recording and analysing the information collected. All should agree on how and when the information will be reported;
   - Estimate the time frame and the resources needed (stationery, data processing tools, personnel) for each stage of the assessment, such as training field staff and volunteers, collecting and analysing data;
   - Assign specific tasks and responsibilities to each member of the assessment team;

5. Inform all departments within the organisation that need to be directly involved with the assessment—logistics, finance, human resources etc. Identify the person at headquarters who can be contacted from the field during the assessment;

6. Collect essential equipment. All members must have double communication means, survival gear and GPS as deemed important, apart from maps, first aid kits etc.;

7. Check the security situation in the field and make contact with local authorities and other organisations;

8. Ensure there is someone based locally to arrange the assessment team's transportation, communication, accommodations and meals;

9. Be aware of the common mistakes that can occur during any assessment. Try to prevent errors by using the actions shown in the following table.

Table 6-5: Preventing common errors during a rapid health needs assessment

Common errors	Preventive action
The assessment is poorly co-ordinated between various Non-Governmental Organisations (NGOs) and excludes the host government and the affected community.	Appoint a team leader to co-ordinate the assessment with the host government, the affected community's leaders, and other agencies so that the results are shared, are not duplicated and ensure future support of relief activities.
The assessment team lacks the expertise needed.	Select members of the team with disaster-specific (prior experience), site-specific (geography, language, culture) or speciality-specific skills (epidemiologists, physicians, public health nurses, logisticians, environmental engineers). Psychological trauma and reproductive health are often not assessed. Health related sectors like shelter, water and sanitation, relief needed.
The needs assessment is conducted too late. Collecting information requires time, yet often time is limited.	Strengthen disaster preparedness by establishing an early warning system for detecting humanitarian emergencies.
The data collected is often incomplete (due to poor access) or inappropriate (does not cover all the important areas).	Plan the field assessment: define the objectives, the relevant information needed and methods for collecting data. Discuss plans with local authorities, community representatives and other agencies.
The data collected is not linked to an ongoing information system. More data is collected than is needed or used.	Ensure that one of the main objectives for carrying out the needs assessment is setting up an information system. Collect only data that can be processed.
The estimated size of the target population—the critical denominator—is unreliable.	Make better estimates by mapping the location and dividing it into sections. Determine the average family size in selected households of some sections and apply findings to the entire map.
The survey sample does not accurately represent the affected population.	Follow epidemiological procedures when carrying out population-based surveys.
The assessment report does not consider the affected population's perceived needs.	Involve representatives from the affected population at every stage of the assessment, including drawing conclusions from the local response and outstanding needs.

Common errors	Preventive action
Causes of death are incorrectly attributed to the disaster even for slow-onset disasters, such as drought and famine.	Collect background information: interview former staff, local authorities, and the media; review field reports, country profiles, and Internet/Medline.
Assessment team members do not complete their tasks as they are drawn into establishing initial activities. Thus, there is insufficient time for accurate assessments, the assessment period is extended and serious delays in vital action can occur.	Arrange for a local emergency response team (health, fire, police) to take care of the injured and limit harm from hazards (fire, disease epidemics, etc.) so that the assessment proceeds smoothly.
Information is not shared with government, other agencies and clusters.	Discuss before assessment when and how to share common planning and priority settings.

Defining the information needed

Defining in advance what information is needed about the emergency can improve the coverage and quality of the needs assessment. It can also help to identify the sources of information to be contacted on arrival at the site. Many checklists for rapid assessments have been developed, some of which classify indicators under different data categories. They are supposed to guide assessment teams in thinking about the information they might want to collect in the rapid needs assessment as well as to ensure that they have covered the key issues. Assessment checklists should not be considered as simple exercises for filling out data forms. Checklists that are used should first be adapted to the context and culture of the specific emergency. Not all the information in the checklist might be needed or be relevant for every assessment.

Table 6-6: Sample checklist for rapid health needs assessment[13]

Preparation
- Obtain available information on the disaster-affected population and resources from host country and international sources.
- Obtain available maps and aerial photographs.
- Obtain demographic and health data from host country and international sources.

Security and access
- Determine the existence of ongoing natural or human-generated hazards.
- Determine the overall security situation, including the presence of armed forces or militias.
- Determine how much access humanitarian agencies have to the affected population.

Demographics and social structure
- Determine the total disaster-affected population and proportion of children under five years old.
- Determine age and sex breakdown of the population.
- Identify groups at increased risk, e.g. children, women, older people, disabled persons, people living with HIV, members of certain ethnic or social groups.
- Determine the average household size and estimates of female- and child-headed households.
- Determine the existing social structure, including positions of authority/influence and the role of women.

Background health information

- Identify pre-existing health problems and priorities in the disaster-affected area prior to the disaster. Ascertain local disease epidemiology.
- Identify pre-existing health problems and priorities in the country of origin if refugees are involved. Ascertain disease epidemiology in country of origin.
- Identify existing risks to health, e.g. potential epidemic diseases;
- Identify previous sources of health care;
- Determine the strengths and coverage of local public health programmes in refugees' country of origin.

Logistics

- Assess transport, fuel and storage of food, vaccines and other supplies, communication.

Mortality rates

- Calculate the Crude Mortality Rate (CMR).
- Calculate the Under-Five Mortality Rate (U5MR) which is the age-specific mortality rate for children under five.
- Calculate cause-specific mortality rates.

Morbidity rates

- Determine incidence rates of major diseases that have public health importance.
- Determine age- and sex-specific incidence rates of major diseases where possible.

Available resources

- Determine the capacity of and the response by the Ministry of Health of the country or countries affected by the disaster.
- Determine the status of national health facilities including total number, classification and levels of care provided, physical status, functional status and access.
- Determine the numbers and skills of available health staff.
- Determine the capacity and functional status of existing public health programmes, e.g. Expanded Programme on Immunisation (EPI), maternal and child health services.
- Determine the availability of standardised protocols, essential drugs, supplies and equipment.
- Determine the status of existing referral systems.
- Determine the status of the existing Health Information Systems (HIS); make recommendations for what should be done if none exists.
- Determine the capacity of existing logistics systems, especially as they relate to procurement, distribution and storage of essential drugs, vaccines and medical supplies.

Consider data from other relevant sectors

- Nutritional status;
- Environmental conditions;

Food and food security.

When possible, use standard guidelines and forms, and include information about other sectors. Before carrying out the assessment, check with the lead health agency in the emergency to identify if a standard assessment form is being recommended, as this is usually common. If so, use the standard assessment form and process.

Depending on the situation, look at specific items, such as norms and attitudes regarding gender and gender based violence, existing protection and response systems and the nature of gender based violence in the community.

Initially, it might only be feasible to collect age-specific data about under fives and for those above five (<5 years and >5 years).

Sources and methods for collecting data

Good sources of information for the initial assessment can be identified according to the background information and the type of information needed. Review available health records at health facilities to determine the major causes of death and illness during the initial assessment. If records are poor or not available (e.g. destroyed by floods), establish the commonly perceived causes of mortality and morbidity by interviewing local health workers and health officials. To minimise bias, the beneficiary population can also be consulted during the initial assessment or shortly after. Ask specifically about children to identify if the beneficiaries have problems utilizing health services. This also helps involve beneficiaries in the design of health services from the outset. Selected beneficiaries should be from diverse backgrounds such as age, gender, and ethnicity.

The dispersed population/camps administrator and health workers are also important sources of information. How the data will be collected during field assessment depends on the nature of the emergency and the time and resources available for the assessment including the skills of the assessment team. Data can be collected using quantitative and qualitative methods such as observation, reviewing existing records, key informant interviews, patient narratives, focus group discussions and surveys. Possible sources and methods of collecting data in emergencies are summarised in the table below. (For details about qualitative research methods, consult texts listed under references and suggested readings).

Table 6-7: Sources of information and methods of data collection
for a rapid health needs assessment

Source	* Information to be collected	Method of data collection
Affected population	Background information, pre- and post-disaster community health information, environmental conditions, needs and available resources, future prospects.	Surveys, observation, mapping, interviews, focus groups.
Host government authorities	Background information, demographic profile of local and displaced population, needs and available resources, future prospects.	Mapping, interviews, review census and survey reports (e.g. Demographic Health Survey).
Health authorities (local/central ministry of health (MOH))	Morbidity and nutritional status, reproductive health needs, environmental conditions, health policies, needs and available resources.	Interviews, review registers, surveys, reports.
Health facilities (MOH, private, NGO)	As above for local (and perhaps displaced) populations, needs and available resources.	Observation, interviews, review registers, surveys, reports.
Humanitarian agencies (international and local), multi-lateral agencies (e.g., UN), media, internet web sites	Background information, pre-/post-disaster demographic and health status data, needs and available resources, future prospects.	Interviews, review registers, surveys (e.g., demographic health survey), situation reports.

* Refer to the previous checklist for full details.

Conducting the rapid health needs assessment

A needs assessment can be carried out by following the same logical sequence as individual patient assessments, which includes: briefly observing patients on arrival, taking their history (interviews and review existing records), physical examination, interim diagnosis, planning a follow-up assessment if necessary. Similarly, after collecting the background information, the following steps may provide a logical approach to a field assessment:

1. Preliminary observations should be done if possible when approaching the site by vehicle or aircraft. Assess the environment and extent of the disaster's damage and population displacement.

2. Interview officials from the local government, the public health sector, local organisations, volunteers, health workers and the affected community (leaders of different ethnic groups, women) etc. in order to:

    ▪ Confirm or update background information on the health needs and local response;

    ▪ Identify individuals or groups of people in life-threatening situation;

    ▪ Whether the host government will accept intervention.

3. Review existing records at the local or national level (host country, agencies, media, and health facilities) including maps, aerial photos, census health data etc. This helps establish baseline information on demography, the displaced and the host populations' health status, the existing services' function and capacity (e.g. relevance of the health information system).

4. Detailed visual inspection: walk around the displaced community and surrounding areas to investigate rumours and gather valid impressions about the following:

    ▪ The layout of the camp or settlement (from the highest level e.g. from the top of a hill, tree, or building), the estimated number of people involved, the local infrastructure and the resources;

    ▪ The living conditions and access to sanitation, water supply, food supply, health services and the level of insecurity;

    ▪ How much normal life and the social structure has been disrupted, the affected populations' coping mechanisms and any other issues of secondary priority such as reproductive health needs and mental health.

*Interviewing affected
community members in
Guatemala
Photo: International
Federation*

Note: where the disaster affected community is widely dispersed within a host population, a walk-through tour may help provide insight on their distribution. Some areas might be more densely populated than others for various reasons. The more populated areas might have worse living conditions.

5. **Rapid surveys:** Conduct rapid surveys using convenience or cluster sampling of households to estimate the demographic profile, health status including immunisation status and priority health problems of the affected population. Innovative methods of sampling can be adopted to sample enough displaced persons per cluster where a disaster affected community is dispersed within a host population setting. Examples include snowballing technique (locating the first subject and enquiring for

information on the next subject with similar characteristics) or measuring the proportion of displaced persons among all the subjects surveyed within a cluster and projecting this number to estimate the entire disaster affected population.

6. **Prepare a basis for ongoing health information**: Use the assessment findings to set up a health information system. Ongoing collection and analysis of information over time will refine the findings of the initial assessment. Population surveys can be organised soon after the assessment to:

   ▪ Provide valid base-line information if missing;

   ▪ Determine the priorities for the programme (e.g. cholera prevention and control, selective feeding, measles immunisation, etc.).

7. **Preliminary analysis**: A timely and careful analysis of the assessment findings is necessary to provide a basis for programme planning. However, the skills or the resources to carry out a detailed analysis may not exist. Simple analysis procedures may be performed in the field, including summarising statistics, frequency tables, calculating percentages, rates, and plotting graphs.
   Key results must be compared to normal reference values or standards to improve understanding and conclusions regarding the disaster situation and help determine the appropriate response. For more details, please refer to the annex on data analysis.

Assessment findings help guide the identification of priority actions for the acute emergency phase. Initial interventions often focus on the prevention and control of diseases of epidemic potential (such as acute respiratory infection, diarrhoea, measles, malaria, meningitis). Priority interventions can include the provision of a sufficient and safe water supply, adequate sanitation, measles immunisation, disease surveillance, and distribution of bed nets, food aid and food security, shelter as well as provision of basic clinical and reproductive health services (Minimum Initial Services Package). As the situation stabilises, the range of services can expand according to the needs of the affected population, the evolving disaster situation and the available resources. This requires a more comprehensive Health Information System. The table below summarises emergency and post-emergency interventions as recommended by the Sphere Humanitarian Charter.

Table 6-8. Priority health services in emergencies by phase

Health service	Emergency phase	Post-emergency phase
Child health	▪ Immunisation (measles, Vitamin A), ▪ Growth monitoring ▪ Curative (acute respiratory infection, diarrhoea measles, malaria, skin infections, anaemia), ▪ referral for danger signs,	▪ Expanded Programme on Immunisation programme (measles, diphtheria, polio, whooping cough, TB)
Curative care	▪ Basic health care (triage, outpatient, referral, inpatient, dressing/injection) ▪ Referrals	▪ Treatment of TB and other chronic diseases (diabetes mellitus, hypertension, arthritis)
Surgery	▪ Manage minor injuries ▪ Referral of emergency conditions and injuries ▪ Temporary field unit if poor access to referral hospital	▪ Surgery for chronic conditions such as hernia or uterine prolapse

Health service	Emergency phase	Post-emergency phase
Reproductive health	Minimum Initial Service Package (MISP):	Comprehensive reproductive health care: ▪ Antenatal care, emergency operations centre, prenatal care, Family planning, STI/HIV Prevention and treatment
Pharmacy	▪ 'Push' system for drug kits ▪ New Emergency Health Kit	▪ 'Pull' system for ordering drugs ▪ Essential drugs supply ▪ Standard treatment protocols
Laboratory	▪ Initially clinical diagnosis or referral of specimens; ▪ Seek to provide tests for detection of outbreaks (cholera, dysentery or meningitis) or high drug-resistance (malaria, dysentery)	Basic laboratory investigations (malaria, helminths, haemoglobin, gram stain, sputum smear, blood sugar, HIV test). Possibly blood transfusions
Mental health	▪ Prepare plans.	Community-based programme for the emotionally traumatised
Health Information System (HIS)	Initial assessment Establish surveillance system using simple indicators	▪ Ongoing surveillance ▪ Population-based surveys ▪ Periodically review and update HIS
Preventive health	Community based activities include: IEC, ORT, disease surveillance, population estimates	Community mobilisation for disease control activities Tertiary care for physical disability

For more detailed descriptions about specific interventions for the acute emergency and post-emergency phase, please refer to the relevant chapters.

8. **Report findings**: After the analysis, write an assessment report as soon as possible about the key findings and recommendations under the following headings:

    ▪   The assessment methodology;

    ▪   The disaster situation;

    ▪   The affected population;

    ▪   The local response and capacity;

    ▪   The external resources needed;

    ▪   The recommended actions.

Vital assessment data or findings can be immediately transmitted via the Internet, by voice or SMS. All findings and analysis must be shared with government authorities, coordinating body and/or cluster and other agencies to ensure full coordination and preparation for a unified and prioritised set of interventions.

The following information about the assessment must be clearly stated in the report:

▪ *Time* for monitoring trends by mapping when events happened, (e.g. before and after flight);

▪ *Place* for comparing different sites, (e.g., camp A and camp B, or with host population);

▪ *Person* for calculating *age-specific* and *sex-specific* rates to identify the population subgroups at increased risk.

9. **Dissemination**: Give feedback to everyone who participated or has a stake in the assessment. The report should include information about the following:

   ▪ The assessment;

   ▪ The disaster;

   ▪ The affected population;

   ▪ The local response and capacity;

   ▪ The external resources needed;

   ▪ The recommended actions.

10. **Recommendation for follow up surveys**: Try to indicate as early as possible, which in-depth assessments are required urgently.

11. **Special considerations during response**: The findings should have some bearings on future surveillance and intervention in recovery and long term rehabilitation efforts. Many health care systems are disrupted after major disasters. Facilities left standing might be only operating at a reduced capacity especially at the disaster's peripheral level mainly due to the lack of resources and mismanagement. This health care gap will likely widen over time with a brain-drain of doctors and nurses from the periphery. As disasters become more frequent, the time for recovery and return to any sense of normalcy will become a bigger problem for future governments because many continue to spend large proportions of the health care budget (even 60 to 80%) on higher level of care. These challenges must be considered during the emergency response in most developing countries: how to set up emergency operations with incompetent health care systems.

Surveillance

Surveillance is defined as the ongoing, systematic collection analysis and interpretation of health data, linked with giving feedback to people at all levels of the data collection system as well as applying the information to disease prevention and control measures.

Setting up a surveillance system

A surveillance system for emergency health care should be started from the initial needs assessment. The goal of surveillance is to give timely information about health problems so that diseases and outbreaks can be detected early and health services respond more effectively. Objectives of surveillance include:

▪ Monitoring a population's health and identifying priority immediate and long-term health needs;

▪ Following disease trends for early detection and control of outbreaks;

▪ Assisting in planning and implementing health programmes;

- Ensuring resources are targeted to the most vulnerable groups;
- Monitoring the quality of health care;
- Evaluating the coverage and effectiveness of programme interventions.

The capacity and use of surveillance will vary according to the phase of the disaster. The following table presents differences between surveillance systems set up in the acute emergency and post-emergency phases.

Table 6-9: Surveillance systems in emergency and post-emergency phases

	Emergency phase	**Post-emergency phase**
Duration	1-4 months	From the first month(s) onward
Method of data collection	Screening initial assessment, Simple surveys, Observation by walking around	Regular population-based surveys, Ongoing Health Information System
Main Priority	Reduce mortality rates	Detect disease outbreaks, Design and monitor programmes, Monitor quality of programmes
Type of data collection	Mostly active collection, Largely qualitative	Both passive and active collection, More quantitative
Defining population Size	Sample survey methods	Census and supplemental surveys
Case definition	Simple clinical signs and symptoms, A few common conditions	May include lab confirmation, More in number
Outbreak investigation	Informal, Watch for measles, cholera	Formal with process in place, Reportable disease list
Surveillance and use of data	Simple, Data needed for immediate actions	Comprehensive, Used to assess quality, For longer term health needs, Addresses less urgent issues, (Emphasises public health approach)

Indicators and sources of information

Good surveillance requires standard data collection, analysis and reporting procedures. Because the time and resources for collecting, analysing and reporting data are limited particularly in the acute emergency phase, only the most essential indicators should be selected based on practical use. The following indicators should be included in surveillance systems for all phases of an emergency:

- **Demographic indicators** estimate the total population, vulnerable groups and in-and-out migration;
- **Health Status indicators** estimate mortality rate, morbidity rate and nutritional status;
- **Programme process indicators** estimate the coverage of immunisation, health services, food distribution, water and sanitation.

The sources and methods of gathering information should be carefully selected. The following table defines specific indicators and potential sources of information commonly used in emergency surveillance systems.

Table 6-10: Surveillance indicators and sources of information

Surveillance	Indicators	Sources of Information
Demographic	▪ Total population ▪ Population structure (age, sex) ▪ Rate of migration (new arrivals, departures) ▪ Identification of vulnerable groups ▪ Births	Registration records, Population census, CHW reports Volunteers
Mortality*	▪ Crude Mortality Rate (CMR) ▪ Age-specific Mortality Rate (<5, >5) ▪ Cause-Specific Mortality ▪ Case Fatality Rate (CFR)	Hospital death registers, Religious leaders, Community reporters (including Community Health Workers), Burial shroud distribution, Burial contractors, Graveyards, Camp administration
Morbidity 1. Routine 2. Outbreaks (daily)	▪ Incidence rate (new cases) ▪ Prevalence rate (total existing cases) ▪ Age-/sex-specific morbidity rate ▪ Proportional morbidity rate	Outpatient and admission records, Laboratories Feeding centre(s) records, Community health worker records
Nutrition (Frequent surveys while malnutrition rate is high)	▪ Global malnutrition rate ▪ Severe malnutrition rate ▪ Rate of weight gain/loss in MCH clinics ▪ Incidence of micro-nutrient deficiency disorders ▪ Incidence of low birth weight ▪ Average daily ration ▪ Delayed age of menarche	Nutrition surveys MCH clinic records Feeding centre records Birth registers Camp administration
Programme process	▪ Shelter coverage (link with incidence of ARI) ▪ Feeding centre enrolment and attendance ▪ Water and sanitation (quantity, quality, access, monitor against diarrhoea incidence) ▪ Immunisation coverage ▪ Reproductive Health (Ante natal care attendance, deliveries, family planning uptake, STI/HIV prevalence) ▪ Outpatient and inpatient attendance ▪ ORS distribution ▪ Community based mental health care (number of people reached, cases with non-specific illnesses)	Facility records, Immunisation surveys (annual), Traditional birth attendant records

*Note: The **mortality** or **death rate** is the most important indicator of serious stress affecting a displaced population. Death rates in acute emergency situations have been known to exceed five to sixty times that of normal situations. However, measuring this critical indicator during emergency situations may be difficult because data from health facilities' death registers might be incomplete; other methods of data collection must be, therefore, considered (e.g. hiring graveyard monitors, interviewing grave-diggers and shroud distributors as well as doing community surveys). Each method or source of gathering information should be evaluated for quality and reliability.

Alternatives to surveillance

Surveillance systems are often biased because they collect information passively, i.e. they mainly focus on people who use existing services. Other methods of gathering information are necessary for detecting health problems and cases occurring outside the existing facilities. Other methods of collecting information will follow.

Community-based surveillance

In community surveillance, a limited amount of health information is gathered directly from the community (e.g. new cases with a common disease). This might require training volunteers, community health volunteers and extension health workers to recognise and manage cases according to their diagnostic skills. Broad case definitions can help community outreach workers to recognise and refer all possible cases to health facilities. Qualified health workers in higher levels of the emergency health system can be trained to use more specific (but less sensitive) case definitions, which may require laboratory confirmation. This will ensure the surveillance system does not miss any person that is a probable or definite case with a communicable disease. The table below gives examples of case definitions that may be appropriate for workers at different levels of a primary health care programme.

Table 6-11: Case definitions from home to hospital

Diagnosis level of care	Possible case home	Probable case first level facility	Definite case hospital
Malaria	Fever only	Fever + periodic shaking + chills	Rapid diagnostic test or Positive slide for malaria parasites
Measles	Fever only	Fever + rash	Fever + rash + cough or Koplik's spots

Disease surveillance can be improved by encouraging the use of standard case definitions for diagnosing and managing patients and recording data in health facility registers. All patient and hospital records must be monitored regularly to ensure that the recorded diagnosis accurately represents the patient's condition.

Note: Cases diagnosed at different levels of care should be analysed separately.

Surveys

Sometimes it is necessary to organise focused assessments to gather information that is not immediately available through the existing surveillance system. For details on surveys, refer to the next section on population surveys. Key differences between surveys and surveillance are described in the following table.

Table 6-12: Differences between surveys and surveillance

Surveys	Surveillance
Intermittent, focused assessments that collect population-based health data (active).	Ongoing, systematic collection, analysis, and interpretation of facility-based data (mainly passive).
Collect information on demography, morbidity, mortality, nutritional status (acute malnutrition) and programme indicators (e.g., Expanded Programme on Immunisation, reproductive health, and use of health services).	Collect information on demography, morbidity, mortality, births, nutritional (micro-nutrient deficiencies), health services and environmental health indicators.
May be limited to concerned agency/facility.	Should involve all health agencies and facilities.
With appropriate sampling, allows for filling of information gaps in community-level data.	Captures those who attend facility-based services, therefore not representative of all needy groups.
Requires more time and resources to organise, but is a one-time cost only.	Less costly since integrated within routine services and the existing system.

Outbreak investigation

A surveillance system should be sensitive enough to pick up the first few cases with diseases that have epidemic potential (see table below). This can be achieved by training all data collectors to recognise cases with reportable diseases. They should also be given guidelines for immediate reporting of a suspected disease outbreak. All reports should prompt immediate action by the appropriate health authorities beginning with a preliminary investigation to confirm whether there really is an outbreak. (Refer to the section on outbreak investigation for further details).

Table 6-13: Examples of diseases that can cause outbreak

Reportable diseases	Diseases of public health importance
▪ Measles	▪ Rabies
▪ Cholera	▪ Tetanus
▪ Meningitis	▪ Sexually transmitted infections (gonorrhoea, syphilis, chlamydia, genital ulcer disease, chancroid)
▪ Hepatitis	▪ HIV/AIDS
▪ Tuberculosis	
▪ Yellow fever	
▪ Haemorrhagic fever	

Analysing and reporting surveillance data

For a surveillance system to be useful, the information that is gathered should be analysed and reported in a timely manner. Data analysis includes summarising data into frequency tables, calculating rates, plotting simple graphs and comparing all information with earlier information. As much data analysis as possible must be done at the field level where it can be used. This will improve the programme's effectiveness. Staff responsible for analysing and reporting surveillance data need to do the following:

- Focus on mortality rates and key causes of illness;
- Display disease trends in form of graphs;
- Ensure information is passed promptly to decision-makers in a manner they can easily understand;
- Give feedback to the data collectors after analysing and interpreting the information. Refer to the data analysis section for further details.

Table 6-14: Example of a 2x2 Frequency Table

Age of patients	Cases with ARI		Total
	Males	**Females**	
Under five years	a	b	a + b
Over five years	c	d	c + d
Total	**a + c**	**b + d**	**a+b+c+d**

Since the main sources of information are health facilities, the most senior person at each health facility should be held responsible for performing simple data analysis (e.g. sorting and summarising data and calculating rates) and forwarding it to the health co-ordinator. At the project office level, the health co-ordinator might perform additional data analysis and interpretation before reporting the findings to the headquarter level and lead agency. The analysis and interpretation of all health information should be linked with feedback to the data collectors. Copies of the surveillance reports must also be forwarded to the district and national health offices (either on a weekly or monthly basis). when a potential disease outbreak, however, is suspected, the district health office should be notified immediately. (For more details, please refer to the section on data analysis and reporting at the end of this chapter.)

Evaluating a surveillance system

A surveillance system can be evaluated and updated from time to time. The following table describes the criteria for evaluating surveillance systems:

Table 6-15: Criteria for evaluating the function of a surveillance system

Criteria	Description
Simple	Data is easily collected and recorded in a logical, transparent manner.
Representative	Indicators used are in line with the defined problem, e.g., use Weight-For-Height, not Weight-For-Age to assess for *acute* malnutrition.
Relevant	Limited to relevant public health information that can and will be acted upon, e.g. prevalence of intestinal worms is not a priority indicator of health status during the acute emergency phase.
Timely	In detecting any outbreak (might depend on the frequency of reporting data)
Reliable	Information is gathered in a standard manner (case definition, tools, procedure) and can be reproduced.
Standardised	Indicators should mean the same to data collectors at a particular level, e.g. the case definition for malaria is the same for all community health workers
Continuous	Performs repeated measurement of the same indicator to detect trends.
Acceptable	To both the affected population and to the authorities.
Flexible	Can adapt to new health problems or sudden programme changes.

The following indicators might also be used for evaluating the surveillance system:

- Percentage of cases or deaths reported as 'Unknown' or 'Other';
- Suitability and use of standard case definitions;
- Ways of disseminating findings from surveillance;
- Who gets and who uses the surveillance data;
- Procedures for making inquiries and for direct reporting of epidemics;
- Use of surveillance findings in decision-making and action.

Population surveys

Surveys are defined as periodic, focused assessments carried out to collect additional health data from a population. They gather information that is not routinely collected by the existing information systems (e.g. to find out if the displaced population has access to food, water, health care etc.).

Basic principles

There are two types of surveys —exhaustive surveys that study the entire population and sample surveys that study a subset of the population. Exhaustive surveys might involve too much time, money, manpower and create many errors. Well-designed sample surveys can provide more valid information about the entire population than interviewing each member of the population.

The DPRK Red Cross has dispatched teams of specialists to Kangwon, South Phyongan and South Hamgyong provinces to make further assessments on the impact of the floods and monitor the distribution of relief packages to the affected people. Delegates from the International Federation are also taking part in the assessment visits.

Relief workers will encounter many situations where they might have to carry out a survey. Because surveys consume many resources (staff, time and money), relief workers might first confirm that the survey information is not available from all possible sources and that a survey is the best way of obtaining it. Surveys can investigate the entire population or only a fraction of the target population (sample surveys). Most health related surveys are sample surveys. The following table outlines the necessary steps for planning and organising surveys:

Table 6-16: Checklist for conducting surveys

Planning	Organising
1. **Plan the survey** ▪ Identify the health problem and its importance ▪ Determine what additional information is required to solve the identified health problem ▪ Establish why a survey is the best way of obtaining the necessary information 2. **Survey design** ▪ Define survey objectives, e.g., to determine the prevalence of malnutrition in children below five years ▪ List the main questions the survey should answer to achieve the survey objectives ▪ Outline methods and instruments for gathering data ▪ Estimate at least two weeks to train staff, conduct the survey and analyse data ▪ Arrange for four to five survey teams, each with a local supervisor and two interviewers ▪ Arrange for equipment and supplies: e.g. GPS, height boards, compass, computers, stationery 3. **Plan how results will be analysed and reported** ▪ Before the survey begins, write up the background and the survey methodology ▪ Work out the main end-results expected from the analyses in form of 'dummy tables' ▪ Draw an outline of the survey report: section headings, tables, graphs, etc. 4. **Sampling** ▪ Define the population to be surveyed and their location based on the survey objectives, e.g., under-five population may be assessed for malnutrition ▪ Decide on sampling method and calculate the sample size. Cluster and systematic random samples are most common. ▪ Outline the logistical plan for sampling 5. **Design the survey questionnaire** ▪ Select indicators and limited number of questions according to defined objectives. ▪ Translate and back-translate the questionnaire using different persons. ▪ Keep key terms in local languages ▪ Pilot test the questionnaire, methods, equipment and analysis procedure	6. **Prepare the community** ▪ Inform the community leaders about the purpose and method of the survey ▪ Get their agreement and co-operation 7. **Train the supervisors and interviewers (and translators)** ▪ To sample respondents as needed ▪ To keep their respondents interested during the interview ▪ To ask each question in a standard way ▪ To take measurements correctly and record data on the questionnaires ▪ Practice sessions may help identify problems in understanding questionnaire by data collectors and households. ▪ Make any corrections to the questionnaire or the training before starting the survey 8. **Conduct the survey** ▪ Involve community members and leaders ▪ Arrange for supervision and regular discussion ▪ Review completed questionnaires with the interviewers 9. **Analyse and interpret the data** ▪ Manually tabulate the data (tables, frequencies) ▪ Calculate averages, percentages, rates, etc. ▪ Graph and tabulate analysis results ▪ Nutrition measures may be tabulated and analysed using computer software such as Epi-Info (from CDC/Atlanta) ▪ Interpret results in light of other information 10. **Survey report** ▪ Write a survey report and present findings to and receive feedback from the community, MOH, other NGOs, and survey data collectors ▪ Incorporate data and feedback into health information system ▪ Develop recommendations and action plan from survey results and feedback (no survey without action) 11. **Evaluate the survey** ▪ If survey objectives were achieved, key lessons learned in the process ▪ Programme changes resulting from the survey ▪ Effectiveness of revised programme in addressing health problem and needs identified under step 1

Survey design

A population survey is carried out to achieve particular objectives. These will depend on the main problems affecting a displaced population. Objectives for the population survey can be selected from the following:

▪ To measure the incidence or the prevalence of a disease or health condition, such as malnutrition;

▪ To measure past events such as mortality rate during a certain period;

▪ To estimate the coverage or use of specific services such as immunisation and outpatient clinics;

▪ To identify groups at increased risk of specific conditions (vulnerable populations) that should get treatment or referral to health services;

▪ To learn about local beliefs, customs, practices etc. relating to health;

▪ To test a hypothesis (an educated guess or theory) about the link between risk factors (e.g. hook worm infection) and presence of a health condition (e.g. anaemia).

After setting the objectives, define the main questions that the survey will try to answer. For example, for a population with high levels of anaemia, a survey may help determine whether the presence of anaemia is related to hookworm infection. These questions can be compiled into a questionnaire to be used for gathering the required information.

Planning the analysis and reporting

How information from a population survey will be analysed and reported needs to be determined early in the planning stage. 'Dummy Tables' are useful for summarising survey findings, as shown below.

Figure 6-2: Examples of 'Dummy tables' for a hookworm survey

Distribution of hookworm infected people by age and sex

Age of patients	Cases with hookworm infection		Total
	Males	**Females**	
Under five years			
Over five years			
Total			

Distribution of hookworm-infected cases by levels of haemoglobin

Haemoglobin level	Hookworm infection		Total	% with hookworm
	Present	**Absent**		
Less than 10 g%				
10g % or more				
Total				
% with anaemia				

Estimating sample size

Table 6-17: Estimating sample size

Estimating sample size for sample random or systematic sampling	Estimating sample size for cluster sampling
$$N = \frac{Z^2 pq}{d^2}$$ ▪ N = size of sample ▪ Z = level of statistical certainty chosen, or confidence interval: ▪ 95 % => Z = 1.96; 90% => Z = 1.68 ▪ value of z usually rounded to 2 ▪ d = degree of accuracy desired = half the confidence interval ▪ p = estimated level/prevalence/coverage rate being investigated. ▪ (When in doubt, use 50% for maximum sample size.) ▪ q = 1 – p *Example:* To calculate the largest sample within a 10% margin of error and confidence limits of 95% (z = 1.96): $$N = \frac{(1.96)^2 (0.5)^2}{(0.1)^2} = \frac{3.84 \times 0.25}{0.01} = 96$$ **Note**: Confidence interval is the range of values obtained from the sample survey between which we are 95% confident that the true value in the overall population exists. The above calculations can easily be performed using the STATCALC function on Epi-Info[2]. Epi-Info is a public domain software package that can be used to process questionnaires, manage epidemiological databases and perform statistical calculations, including sample size calculations and data analysis.	$$N = 2 \left(\frac{Z^2 pq}{d^2} \right)$$ Because this type of sampling has some degree of selection bias, one should approximately *double* the sample size. Doubling would maintain the same degree of precision as simple random sampling: ▪ N = 2 X 96 = 192 ▪ WHO immunisation coverage survey uses a minimum of 7 subjects per cluster (7 x 30 clusters = 210, which is greater than 192). ▪ The rapid KPC 30-cluster survey (of Child Survival Projects) uses a sample size of 300 (10 per cluster) to ensure that sub-samples are large enough to obtain management type information within statistical margins adequate for making management and programme decisions. **Note**: A cluster sample is recommended for collecting information on condition that is common. It does not give sufficiently accurate estimates for rare conditions.

The above table shows formulas for calculating the appropriate sample sizes for different sampling methods. In general, the larger the sample, the more reliable the estimated results of the entire population will be. Therefore, the size of a selected sample should be large enough to give reliable estimates, but not so large that it wastes limited resources.

A sample size of 100 to 200 randomly selected individuals from a population of up to 20,000 is usually adequate to assess for a common condition. However, a larger sample size is needed when greater accuracy is required or to investigate conditions that have a low prevalence (e.g. maternal deaths).

Note: Sample size tables in standard statistics textbooks can be used to determine the actual sample size needed.

Sampling methods

Sampling is the selection of a specified number of persons in a population for study with the hope that they are *representative*, i.e. the characteristics of the sampled population (study population) are similar to the population from which it is drawn (reference population). In **probability sampling**, every person in the target population has the same known (and non-zero) chance of being included in the survey. It allows investigators to form conclusions about a reference population based on information collected only from a subset of the population. Probability sampling therefore enables the collection of reliable information at a minimal cost. Results from these surveys can also be compared with results of similar surveys performed in another time, place or population. The following are probability sampling methods.

Simple random sampling

- Begin by constructing the sampling frame. List every sampling unit (persons, household, village, etc.) from which the sample is to be drawn;
- Randomly select the required number of units from the sampling frame by drawing lots or using a table of random numbers.

Note: This method is more likely to produce a representative sample, but it can be expensive and difficult to make a sampling frame where a population is scattered.

Systematic sampling

- Begin by randomly selecting the starting unit to fulfil statistical requirements in systematic selection;
- The next sampling units are systematically selected by adding a certain number 'n' (e.g., ten, twenty and fifty depending on the sample size relative to the total population) to the starting unit.

Note: A systematic sample can be drawn without an initial listing (e.g. choose from a line of people or according to the time patients enter a clinic.

Cluster sampling

Cluster sampling begins with a list of clusters (community or administrative subdivisions, e.g., sub-location, village, zone, plot etc.). For the first stage, a certain number of clusters (usually thirty) are randomly selected, based on the cumulative frequency distribution of a population. For the second stage, a specific number of *sub-units* (a minimum of seven) are randomly selected *within each selected cluster*.

- Determine the direction line by spinning a bottle on the ground;
- The starting sub-unit (e.g. household) is randomly selected by picking a random number between one and the total number of households along the direction line between the geographical centre (e.g. market, mosque, church) and the cluster boundary;
- Subsequent households might either be the nearest household from the entrance of the one just sampled or every n^{th} household (where the sampling frequency might be the total number of households along the direction line, divided by the required number of subjects per cluster, (e.g., seven);
- In each *selected household*, a suitable subject (e.g., child younger than five) is sampled and examined if present. The selection continues until all the required *subjects per cluster* have been interviewed.
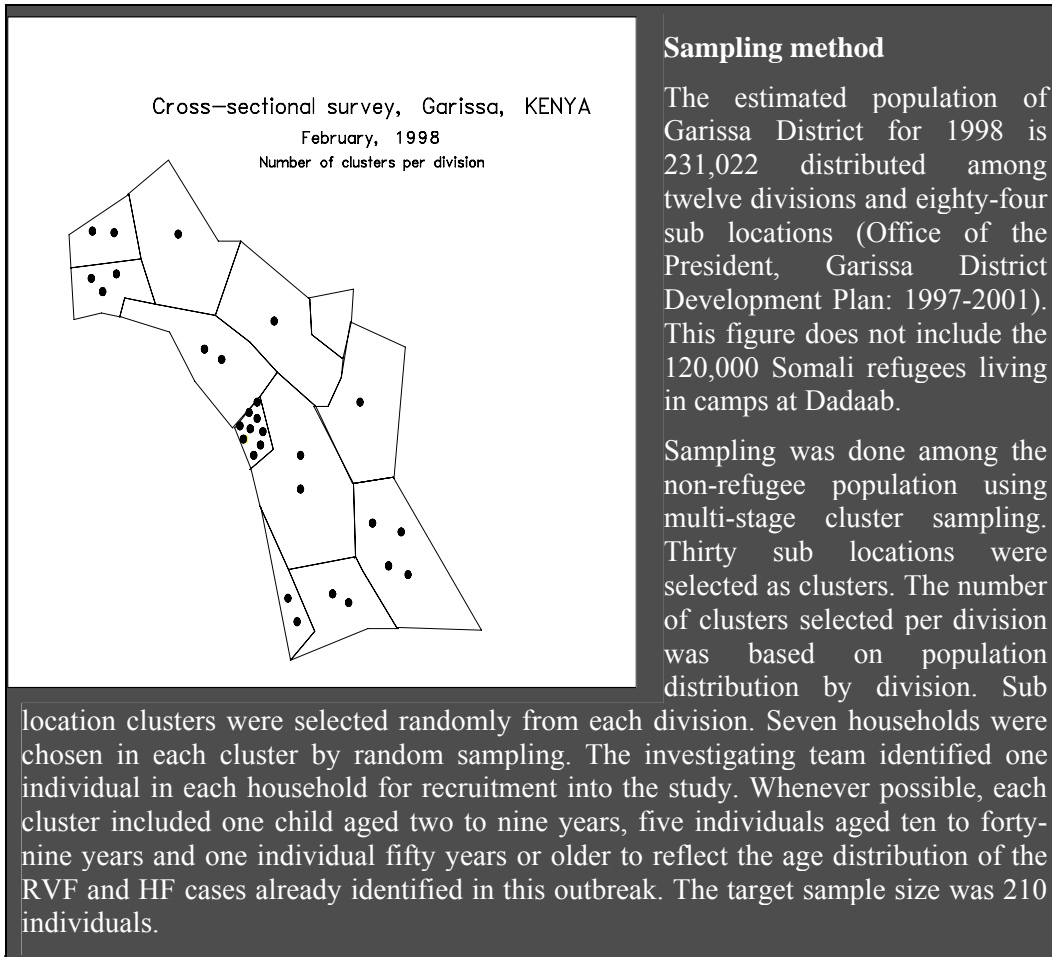
  Note: Consider the following points when selecting subjects in a cluster:

- If the suitable subject in a selected household is not available, select the next household in the same direction;

- If there are not enough subjects in the cluster, the survey team for that cluster should go to the next nearest house in the next nearest cluster;
- If the last household has more than one suitable subject present (e.g. three children less than five-years-old), include the other children in the survey.

The following figure shows an example of cluster sampling.

Figure 6-3: Example of cluster sampling (WHO)[16]

Sampling method

The estimated population of Garissa District for 1998 is 231,022 distributed among twelve divisions and eighty-four sub locations (Office of the President, Garissa District Development Plan: 1997-2001). This figure does not include the 120,000 Somali refugees living in camps at Dadaab.

Sampling was done among the non-refugee population using multi-stage cluster sampling. Thirty sub locations were selected as clusters. The number of clusters selected per division was based on population distribution by division. Sub location clusters were selected randomly from each division. Seven households were chosen in each cluster by random sampling. The investigating team identified one individual in each household for recruitment into the study. Whenever possible, each cluster included one child aged two to nine years, five individuals aged ten to forty-nine years and one individual fifty years or older to reflect the age distribution of the RVF and HF cases already identified in this outbreak. The target sample size was 210 individuals.

Exhaustive sampling

Sometimes, the entire population must be surveyed e.g. when investigating a disease outbreak or selecting only a group of people for the study can create a strong feeling of discrimination in the population.

Choosing a sampling method

The type of sampling method selected depends on whether a sampling frame—a list of individual people from which a sample is to be drawn—exists. When a map with a prior census is available, subjects can be selected using simple random sampling or systematic sampling. However, a 'second-best' cluster sampling procedure is the only option where a population has not been settled in an orderly manner (as is the case in many refugee camp settings). The most commonly used sampling methods are systematic sampling and cluster sampling. The following table describes the main differences between these two methods.

Table 6-18: Systematic sampling and cluster sampling

Systematic sampling	Cluster sampling
Ideal where shelters are arranged in an orderly manner.	Most suitable method when the site is not arranged in an orderly manner and the population is large and spread out in groups.
Requires more effort to construct a detailed list of individual subjects (from census or registration) as a sampling frame.	Survey is faster because people are grouped together. Less effort because only a simple sampling frame, lists of clusters (e.g., villages) with population estimates, is needed.
Systematic selection may not necessarily produce a random sample.	Potential for errors if the variable (e.g. disease) being studied is clustered within the population.
Provides more precise estimates of the reference population from a similar sample size.	Less precise, therefore, requires a larger sample. The sample size formula is used but, because of the design effect, 'n' is multiplied by two.

Designing a questionnaire

Questionnaires are useful for collecting information that may be difficult to obtain in any other way. Although designing a questionnaire might look simple, it is in fact difficult. Whenever possible, use pre-tested questionnaires from the local or international organisations (such as the host ministry of health, WHO, Demographic and Health Survey (DHS). Develop new questions for any additional information. Expanded Programme on Immunisation information can also be referred to as a useful data collection and analysis software. Pictures are useful for illustrating questions that are difficult to state in words or for illiterate data collectors. To develop complete questionnaires, focus group discussions can be used to develop the first draft.

Key steps for designing questionnaires

The following steps outline the process for designing a questionnaire:

1. Define indicators that meet the survey objectives, including definition of cases and events;

2. Identify the easiest method for assessing each indicator;

3. Develop questions that produce the required information for each indicator;

4. Check each question against the survey objectives. Keep only those questions that provide the most essential information;

5. Ensure each question is clear, simple, short and easy to ask;

6. Decide whether to make the questions open-ended (i.e. narrative response) or closed (i.e. coded);

7. Test new questions on dummy tables (see planning the analysis and reporting section) to confirm that they will assess the selected indicators;

8. Translate the questionnaire into the local language and then translate it back to the original language to identify any mistakes;

9. Ensure there is a logical flow of questions in each section. Begin with general questions and end with the more sensitive questions;

10. Place instructions for the interviewers at the beginning of each section;

11. Provide enough space between questions for recording responses;

12. Pilot test (try out) the questionnaire and other survey instruments (e.g. weighing scales, tape measures) in an area that is not to be surveyed. Check that no essential information has been left out and the interview is short (less than twenty minutes);

13. Consider all problems encountered during the pilot test of the questionnaire and make final changes.

Figure 6-4: Sample questionnaire for a childhood mortality survey

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Questionnaire for childhood mortality survey

1. Are there any children less than five years of age currently living in this household? (Yes/No) _____

    If yes, how many? _____

2. Have any children less than five years of age in this household died during the past year? (Yes/No) _____

    If yes, how many? _____

3. How old was each child at the time of death? _____

4. Did the child have any of the following during the week before death:

    ▪ Fever with cough?

    ▪ Fever without cough?

    ▪ Diarrhoea?

    ▪ Fever with rash?

    ▪ Accident?

5. Which other symptoms did the child have? _____
    _____

6. Which of the health problems do you think was the cause of death in your child?
    _____

7. Did the child visit the health post during the week before he/she died? (Yes/No)
    _____

Common problems with questionnaires

The following are common problems with questionnaires:

▪ Too many questions—after questions on personal details (name, age, sex, etc.), add another ten to fifteen questions to limit the interview to a total of ten to twenty questions;

▪ Leading questions—ensure questions are neutral. Do not suggest that a particular answer is correct;

▪ People are asked about events that they cannot recall. In general, the maximum recall period that can be relied upon is two weeks (except for major events such as admission to hospital or death);

▪ Interviewers are left free to interpret the answers. Use pre-coded answers or record exactly what the subject says;

▪ The questionnaire is constructed in one language but administered in another;

▪ Interviewees might be concerned about the nature of the questions and who will be informed of their responses. A full explanation about the survey should be given prior to the interview with strong reassurances about the confidentiality of their participation and use of the information.

Training and supervising interviewers

Train all interviewers to administer the revised questionnaire in a standard way otherwise they might influence how interviewees respond to the questions. They should be trained to ask questions in a neutral way and refrain from giving advice.

Even if samples are carefully selected, surveys' results can still mislead. Interviewers should be closely supervised to prevent the following:

▪ **Non-response bias** can occur if a high proportion of the sample population is missing or did not answer the questions. For example, a survey done during the day might miss young men and women who have gone to work. People might not be willing to answer sensitive questions. Non-response bias can be minimised by the following:

  - Ensuring that at least 80% of the original sample population responds during the survey;

  - Following up all non-responders at least once;

  - In many cultures it is important that women interview women and men interview men particularly for sensitive subjects like family planning, STDs and HIV/AIDS;

▪ **Observer error** can arise in commonly occurring inaccuracies because the interviewers recorded faulty measurements rather than because of faulty instruments or unreliable subjects. Observer errors can be reduced by the following:

  - Making all interviewers sign their names on each questionnaire they administer;

  - Checking that interviewers follow standard guidelines when taking and recording measurements;

  - Checking instruments daily and adjusting the zero reading on weighing scales.

Table 6-19: General outline for a survey report

Outline for a full survey report	
Introduction	**Survey results**
▪ Purpose of survey	▪ Highlights
▪ Survey area	▪ Graphs with charts and tables
▪ Dates of survey	**Conclusions and recommendations**
Methodology	▪ Significant findings
▪ Indicators	▪ Problem areas
▪ Sampling frame	▪ Potential actions
▪ Questionnaire used	▪ Further investigations

Analysing and reporting survey findings

After carrying out the survey, the information in the completed questionnaires must be processed and analysed to be meaningful. It might be transferred into dummy tables and simple calculations performed in the field by hand or with the help of a pocket calculator. Further analysis might only be possible at the project office and the ministry of health levels. In the early phase of a disaster, vital data and information must be transmitted immediately because the next day things might look different. For the best possible common analysis and coordinated and prioritised action, information sharing with all agencies, cluster and government is absolutely vital.

The following table shows a general outline of a report to present the data to programme decision-makers in a way that they can understand. A shorter report focusing on the survey results and recommendations from the survey must be sent to the affected community.

Case study: health survey among an internally displaced population in Liberia[22]

Background

In May 2002, thousands of Liberians were forced to flee as a result of clashes between government forces and dissidents. Nearly 70,000 people were displaced including Internally Displaced Persons (IDPs) previously living in the camps. This last wave of displacement created additional needs for shelter, health, sanitation and food aid.

All displaced persons were distributed in fourteen camps and sites located in Montserrado and Bong Counties. The full extent of the mortality and morbidity status in all camps following the forced migration in May was not well known. Nutritional status for at risk populations in all the camps and sites, particularly for the under fives, was not assessed. A baseline assessment was organised to determine the magnitude of the problem, the existing resources and the existing gaps so that all problems could be tackled.

Methods

Survey population

Eleven camps in Montserrado and Bong counties were included in the assessment. Five of the camps were located in the Montserrado County with an estimated population of 77,000, while the remaining six camps in Bong county had an estimated population of 39,000.

Sampling

The sampling method selected for the mortality and nutritional assessment was systematic random sampling. A minimum sample size for the mortality survey was calculated based on the June population estimate and a sampling interval of one in ten houses was defined. Deaths since interviewees arrived to the camp were recorded and the month and year of death identified using the events calendar. Crude Mortality Rate and Under Five Mortality Rates were calculated for the month of July.

Survey questionnaire

Age: the age of a child under five was noted in months and determined as accurately as possible using a calendar of local events. For adults, age was registered in years.

Anthropometric assessment: Mid Upper Arm Circumference (MUAC) was measured at the midpoint between the shoulder and elbow of the left arm while the arm was relaxed. MUAC is expressed to the nearest millimetre.

Measles vaccination: the mother was asked if the child had been vaccinated against measles and was asked to show the vaccination card or other official document proving the child had been vaccinated. Two data entries were recorded: yes proven by vaccination card or no if a vaccination card could not be produced.

Reproductive health care: any pregnant woman found in a selected house was asked if she had visited a health clinic for her pregnancy since her arrival to the camp. Any woman that had given birth since arriving at the camp was asked if she had gone with her child to the clinic to be checked within the first ten days of her delivery.

Mortality: mortality data was collected from interviews with the head from all the selected households including households with no children aged between six to fifty-nine months. Data included the number of people living in the household and number of people that had died in the household between their arrival to the camp and the date of the assessment.

Cause of death: inquiries were made about the presumed cause of each death, reported and registered as stated by the respondent.

Data collection

Four data collection questionnaires for demographic, mortality and nutritional data and a fourth for health services assessment were made in consultation with the International Rescue Committee health team in Liberia. The survey instrument was pre-tested in habitats and modifications done accordingly.

Five three-member teams administered the questionnaires after attending four-day training for the survey. A team leader was appointed for each team to scrutinise the record forms for errors and omissions, condense key information gathered and address any problems the other team members might encounter during data collection.

Before initiating data collection in each camp, one team met with key informants to draw a map of the camp that identified how displaced people were distributed at the time of the survey. Once all blocks in the camp were identified, they were divided among the teams. Each team met with block leaders or members to establish each block's limits. Once established, the first household of a block was selected using random numbers. After the first house was selected, every tenth house was visited until the block was completed.

Houses selected for the survey were grouped into four categories:

▪ Under construction with no one living in them;

▪ Constructed but unoccupied;

▪ Constructed and occupied with occupants present at the time of the visit;

▪ Constructed and occupied with occupants not present at the moment of the visit.

Whenever a house was found under construction or unoccupied the next house in the sampling interval was visited. When occupants where not present at the time of the visits they were revisited twice. If two or more eligible children for measurement were found, all of them were measured. Whenever children were not found in a house, the following house in the sampling interval was visited.

At each house, interviewers asked about basic demographic information, water source and mortality for the data. A local calendar of events was used to determine household members' ages and dates of death. Mid-upper arm circumference (MUAC) measurement was performed using a standard measuring tape. When a child's MUAC child was found to be below 135, the child was referred to the clinic for further assessment.

One team collected health services data on morbidity and data from existing registers in the health facilities. The team leader and interviewers held two separate focus group interviews with clients at the health facility: one with women and another with men to identify better the key health priorities and possible solutions as well as the resources needed to address them.

Data processing and analysis

Demographic, mortality and nutritional data was condensed in a spreadsheet designed for this purpose. Dummy tables were constructed beforehand for the analysis of each of the variables. Appropriate biostatistical and epidemiological programmes were used to process and analyse the data. Health services data was condensed in a spreadsheet and dummy tables were constructed beforehand to facilitate analysis.

Results

The study found crude and under-five mortality rates of 3.0 and 8.2, respectively, in Mont Serrado County. The major causes of death were diarrhoea (18%), febrile illness (11%), and respiratory infection (10%). The main causes of morbidity were malaria (43%) and ARI (18%). For children under five, 8.2% had moderate malnutrition when measured using mid-upper arm circumference as an indicator of malnutrition.

> *Conclusions*
>
> IDPs in the Liberia camps are facing a critical health situation: crude mortality rates are two times over the emergency threshold. The mortality rates for children under five years old are three times over the emergency threshold.

Rapid clinic-based fever survey for malaria

Clinic-based fever surveys generate information about the prevalence of parasitaemia among symptomatic patients who seek care at health facilities.[17] Using this approach, the proportion of febrile patients with malaria parasites can be quickly determined in emergency settings. The results of a clinic-based survey on fever at health facilities are presented below.

Conducting the survey

Table 6-20: Key steps in rapid clinic-based fever survey for malaria

Conducting the survey
Choose either microscopy or Rapid Diagnostic Tests (RDT) as a diagnostic method.   ▪ RDTs give quick and reliable results, but may be of poor quality;   ▪ Using proper staining techniques, microscopy remains the gold standard for malaria diagnosis.
Ensure that sufficient staff is available and trained in the selected method.
Using RDTs or microscopy, test all febrile patients attending selected high-volume, outpatient clinics. Up to 100 patients should be tested.
Conduct all testing within a short time period, preferably one to three days.
Record the total number of outpatients seen at the clinic while the survey is being done.
Record the age, sex, pregnancy status and place of origin of tested patients.
Repeat the survey weekly during the acute phase and monitor trends at least once every month.

Analysis and interpretation of survey results

Data analysis and interpretation can yield important information about malaria transmission. Using the survey data, calculate the total number of patients at the clinic and fever cases. Determine the proportion of fever cases among all outpatients. For the purpose of a rapid survey, 'fever' should be defined as patients with fever or a history of fever over the past forty-eight hours. Calculate the proportion of confirmed malaria among those with fever. Patients have 'confirmed malaria' if there is a presence of malaria parasites in their blood. This proportion can be represented as the parasite rate, slide-positivity rate, or positive Rapid Diagnostic Tests rate. For ease of interpretation, results can be presented by week and age group. Data can be interpreted as follows for the host and displaced populations.

Host population

Age group	Proportion of parasites in fever cases	Interpretation of malaria transmission
All children and adults	Less than 10%	Low transmission
Children under ten years	More than 50%	High transmission

| Children over ten years and adults | More than 50% | Possible onset of outbreak |

Displaced population

Among the displaced population, interpretation of survey results is more complex. Similar results might suggest different situations, particularly during the first few weeks of settlement. The following table outlines possible interpretations for high proportions of positive malaria among febrile members of a displaced population.

Scenario	Interpretation of malaria transmission
High local malaria transmission	If incoming population is non-immune, high morbidity and mortality rates will be recorded in all age groups.
	If incoming population is semi-immune, children and pregnant women are most at risk, showing high morbidity and mortality rates.
High malaria endemic in area of origin	If the incoming population comes from an area where malaria is often found but the local area is not receptive to malaria transmission, then over time there will be fewer and fewer malaria cases in the health care facilities, as only those who brought it from their home area will have it.
	However, if the area where people are relocated to is receptive to the type of malaria the incoming population is bringing with them, over time an epidemic may start.
High malaria endemic going to another area with high malaria endemic	The immunity acquired in the area of origin might not have the same protective capacity in the new area; the plasmodia are sometimes slightly different.
Travelled through high malaria endemic areas	As above.

Source: WHO

Community cross-sectional malaria prevalence survey

The population survey approach can be applied when information about the prevalence of malaria in a displaced population is needed. The purpose of the community cross-sectional malaria prevalence survey documents the baseline prevalence of malaria among an affected population; identifies groups (e.g. children under five) at particular risk for malaria; determines information about treatment-seeking behaviour; and uses this information to guide and monitor interventions. Information collected from community surveys can help distinguish between low (well under 10% of the population is infected) and medium/high malaria endemic (10% or more of the population is infected).[17] Generally, these rapid surveys take three to six days to complete.

Conducting the survey

Steps in conducting the survey are outlined here.

- **Define the study population**. See the population survey section above;
- **Determine the sample size**. See the population survey section above;
- **Choose a sampling method**. See the population survey section above;
- **Recruit and train survey team.** The team should include a community member to explain the procedure and obtain informed consent from households; one person to

register participants, record auxiliary temperature, the Rapid Diagnostic Tests (RDT) result and information on treatment-seeking behaviour; one person to take auxiliary temperature and conduct the RDT or make a malaria smear on a slide; one person to check for presence of an enlarged spleen; one person to administer treatment and advise about danger signs and follow-up;[8]

▪ **Ensure adequate supplies.** Essential supplies include diagnostic equipment (e.g. RDT or microscope and slides for smears), lancets, rubber gloves, cotton wool, alcohol for swabbing skin, clinic referral forms, consent and record forms, pens and pencils, anti-malarial drugs for treatment (if administered on the spot) and, if needed, funds to pay for transport to the clinic.

Community cross-sectional malaria prevalence surveys should be repeated in different seasons because malaria transmission varies between dry and wet seasons. For areas where high transmission exists all year, the survey can be repeated several weeks after the start of interventions to monitor their impact. Finally in areas with annual peaks in transmission, it will be helpful to repeat the survey after twelve months to assess effectiveness of interventions.

Analysis and interpretation of survey results

At least the following two indicators should be calculated and interpreted from the collected data:

▪ *Prevalence of malaria* can be calculated by determining the proportion of people from the entire population with fever or history of fever and who have a positive RDT result. The data should be analysed by age, sex and pregnancy status. Special attention should be paid to prevalence among children under age five.

▪ *Malaria Endemicity* can be determined by calculating the proportion of the entire population with a positive RDT (or slide result) or the proportion of the entire population who have splenomegaly. The following table offers interpretations of these calculations.[17]

Table 6-21: Classification of malaria endemicity

Malaria endemicity	Spleen rate		Parasite rate	
	Under five years	Over five years	Under five years	Over five years
Meso- and hyper-endemic	Very high	Low or zero	High (>50%), but lower than spleen rate	Low
Hypoendemic	Low (<10%)		≤ 10%, always higher than spleen rate	

Software programmes such as Epi-Info can be used for further data analyses.

Table 6-22: Distinguishing between rapid clinic-based fever survey and community cross-sectional malaria prevalence survey

	Rapid clinic-based fever survey	**Community cross-sectional prevalence survey**
Why	To gather quickly information about malaria prevalence among symptomatic patients seeking care at health facilities.	To document the baseline prevalence of malaria among an affected population in the community. To identify groups (e.g. children under five) at particular risk from malaria.
What	Determines the proportion of treatment-seeking febrile patients with malaria.	Used to determine levels of malaria transmission at the community and sub-population level.
When	Ongoing, continuous	Periodic, intermittent. Typically conducted at baseline (e.g. before implementing intervention) and used to guide and monitor interventions.
How	Using rapid diagnostic tests or microscopy, test all febrile patients attending selected high-volume, outpatient clinics. Up to 100 patients should be tested.	Use population survey methods by defining and selecting the population, determining the sample size and sampling methods, conducting the survey and testing participants in the community.
Cost	Cheap and requires less personnel.	More costly and requires more personnel.
Who	Can be conducted by clinic staff and administrators.	Requires a five member team (see above).
Interpretation	*For host population:* Among all children and adults, if proportion of fever cases with parasites is less than 10%, interpret it as low malaria transmission. Among children less than 10 years, if proportion of fever cases with parasites is more than 50%, then interpret as high malaria transmission. Among children over 10 years and adults, if proportion of fever cases with parasites is more than 50%, then consider outbreak onset.	Malaria is meso- or hyper-endemic if a) spleen rate among under 5 years is very high or among over 5 years is low or zero or b) parasite rate among under 5 years is high (>50%) or among over 5 years is low. Malaria is hypoendemic if the overall spleen rate in the population is low (<10%) or the overall parasite rate is low (≤ 10%) and higher than the spleen rate.

Outbreak investigation

Disease outbreaks or epidemics occur when many people in a community or region develop a similar illness—in excess of normal expectations—through a common source or carrier. An outbreak can be declared following the detection of a single case in a non-endemic area (such as cholera or measles) or after the number of reported cases reach the *threshold incidence rate* of a particular disease (e.g., threshold for meningitis is fifteen cases per 100,000 people in a two-week period). Please refer to the *Control of Communicable Diseases* chapter for more details about epidemic thresholds.

Objectives of investigating an outbreak

The following may be defined as objectives for investigating an outbreak:

- To identify the cause(s) and risk factors for the disease;
- To identify the appropriate prevention and control measures that will reduce the impact of the disease;
- To determine the extent of the disease;
- To provide a foundation for developing public health policy.

Key steps

Table 6-23: Checklist for an outbreak investigation

Key step	Description
1. Notify and coordinate with the host and international health authorities.	- Provide essential information on the affected sites, the time period, the frequency and profile of cases, the clinical presentation and disease outcome, a possible diagnosis and suspected source of infection; - Be sure to coordinate efforts with the national health authorities as well as inter-governmental investigations (e.g. WHO).
2. Confirm the outbreak.	- Define a 'case' and count the number of reported cases (the numerator): Is the disease known? Are the causes partially understood? - Define the denominator: What is the population at risk of developing the disease? - Calculate the attack rates; - Review previous levels of disease and local knowledge of disease outbreaks.
3. Describe the outbreak in terms of *time*, *place* and *person.*	- Graph reported dates of disease onset for all cases to establish the *timing* (incubation period) and the source of disease (single or multiple sources); - Map the residence of all reported cases to identify the most affected areas and the direction of the disease spread (see spot map in the data analysis section); - Calculate the age- and sex- specific rates to identify *who* is most vulnerable; - Collect population data for the communities at risk (more denominators).
4. Analyse *what* caused the outbreak.	- Look for links or interaction between relevant factors (e.g. floods increasing the *Aedes* mosquito population and reducing access to health care resulting in an outbreak of dengue fever).

5. If necessary, conduct additional studies.	▪ Interview cases with disease and non-cases to identify possible *sources* and methods of disease *transmission* (common source or person-to-person); ▪ Determine the proportion of cases and non-cases that had possible *exposure* to infection; ▪ Identify important differences between the cases and non-cases to define the individuals/groups at increased risk of contracting the disease; ▪ Collect specimens from cases and non-cases for laboratory investigation.
6. Assess the environment, if necessary, based on the analysis of the outbreak.	▪ Investigate for vectors, faecal contamination and toxic chemicals.
7. Initiate prevention and control strategies.	▪ Source reductions (treat cases and carriers, isolate cases, and control animal reservoirs); ▪ Prevent transmission (health education, personal and environmental hygiene, vector control, restrict movements); ▪ Protect vulnerable people (immunisation, chemo-prophylactics, personal protection, and nutrition); ▪ Continue surveillance: maintain routine reporting, follow-up suspects, and set up special surveillance for new cases.
8. Prepare a report on the outbreak that covers the following points:	▪ The causative agent and probable routes of transmission; ▪ Description of the trend in the disease outbreak, the geographic distribution and the clinical presentation among cases; ▪ The reason for the outbreak; ▪ Disease control measures that were introduced; ▪ Recommendations for prevention of future outbreaks.

Even though different disease outbreaks might occur, there are key steps to be carried out in most outbreak investigations. These steps are summarised in the table above. The order of the steps might depend on the nature of the outbreak and the existing knowledge about the disease. For example: in suspected cholera outbreaks, appropriate disease control measures must be initiated at the beginning before identifying the cause or risk factors for disease.

When investigating an outbreak, the first step is to confirm that there really is an outbreak. A local public health team might be capable of doing this and sometimes even identifying the possible causes and risk factors. The most effective ways of controlling the spread of disease should be initiated as soon as possible. Sometimes, there is not enough information for identifying either the cause of the outbreak or the appropriate control measures. If the outbreak seems to be spreading and causing many deaths rather than phasing out naturally, a special team of investigators (e.g. epidemiologists, entomologists, microbiologists etc.) might be invited to support the local team. The epidemiologists might help organise a case-control study that compares risk factors among people with and those without the disease. At the end of the investigation, a report should be written and shared with all concerned.

Carrying out the investigation

Because investigating a disease outbreak involves many people, it needs careful planning, organisation and supervision. Key procedures must be followed. If the disease is spreading rapidly, speedy carrying out of the investigation may be critical.

Planning the investigation

- Consider access to the site and the willingness of the community to help the investigation;

- Consider the local climate, the daily family activities and the migration patterns when scheduling the time for data collection;

- Design appropriate questionnaires based on how the information will be analysed;

- Train interviewers to ask questions in a standard way and to practice using the survey's questionnaires and equipment before the investigation;

- Arrange for translators and chaperones to be present during interviews if needed;

- Standardise the sequence of data collection procedures. Most investigations involve epidemiological, clinical, and laboratory procedures. Data should be collected as follows:
  - Collect information directly from the affected person or family member where necessary;
  - Perform a physical examination after the interview;
  - Finally, collect any required laboratory specimens (blood, stool etc.). Preserve all laboratory specimens appropriately.

Organising the investigation

- Involve local authorities for security clearance, publicity and introduce the investigation team to the affected community;

- Sketch an organisational chart that shows the lines of authority, the roles of different teams and the link between functions;

- Remember, 'no survey without services.' Prepare incentives to maintain community participation during the investigation. This might include providing some medical services or essential drugs.

Supervising the investigation

- Supervise field workers by checking how they conduct interviews during the survey and their accuracy in recording data;

- Evaluate the collection and processing of laboratory specimen for quality control;

- Carry out and check data entry daily and perform simple calculations;

- Conduct frequent staff meetings to identify and address any problems.

At the end of the investigation, organise a final meeting with all supporters and participants to thank and give them feedback about the investigation and recommend any long-term measures to prevent and control future outbreaks.

Case study: cholera outbreak investigation after the civil conflict in Liberia[20]

In June 2003 at the height of Liberia's civil war as rebel forces approached the capital city of Monrovia, an estimated 300,000 Internally Displaced Persons (IDPs) settled in private homes with family members, public buildings and in other sites. Because of fighting between June and July, the normal collection of health data by the Liberian Ministry of Health (MoH) was interrupted. In June, cases of cholera were confirmed by international nongovernmental organisations. To estimate the magnitude of the outbreak in August, WHO conducted a retrospective review of data collected by health organisations between June and August 2003 but did make a report to MoH. Additional data was collected from an emergency surveillance system that began operation on August 25. During the week ending October 20, a total of 1,252 cases of suspected cholera were reported (WHO, MoH, unpublished data, 2003). The epidemic began in June (see the figure below) and was associated temporally with increased fighting and the movement of IDPs. Because cholera transmission was probably attributable to an acute shortage of clean water, poor sanitation and crowded living conditions, international and Liberian organisations attempted to supply IDP settlements with sufficient potable water and began chlorinating wells.

FIGURE. Number of cholera cases reported, by week and month — Monrovia, Liberia, January–September 2003
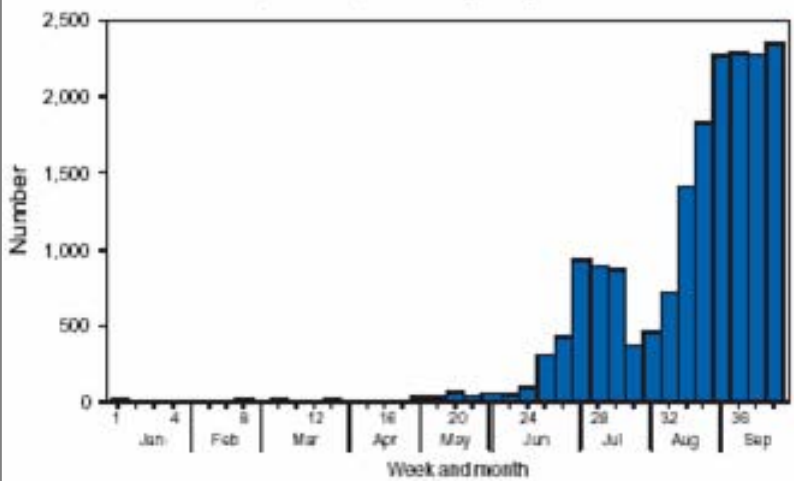
Cases most closely approximating the standard WHO recommended case definition for use in cholera outbreaks (i.e. acute watery diarrhoea in a person aged > five years) were included in retrospective case counts. After August 25, the majority of facilities that reported data to the emergency surveillance system used a case definition that included acute watery diarrhoea in children aged two to four years.

In June, the number of persons treated for cholera increased from forty-nine to 426 per week. Between June 2 to September 22, of an estimated one million permanent residents and 172,000 IDPs in Monrovia (*1*), 16,969 (1.4%) persons sought medical care for an illness consistent with the surveillance case definition for cholera. The number of persons treated for cholera increased sharply in early June and stool cultures confirmed the presence of *Vibrio cholerae* O1; the case-fatality ratio in cholera-treatment centres was <1%. The number of persons treated per week peaked in mid-July at 935, declined to 387 in the last week in July, and increased again to 2,352 between September 16 to-22, the last week for which data was available.

V. cholerae O1 was isolated in the laboratory of St. Joseph Catholic Hospital in Monrovia from stool specimens obtained from six patients during June 9 to 13; Three cholera-treatment centres operated by Médecins sans Frontières (MSF) reported that during June 2 to September 15, out of 4,746 hospitalized patients with illnesses consistent with a diagnosis of cholera, 37 (0.8%) patients died. During this period, 3,073 (64.8%) hospitalized patients had severe dehydration. Data from the cholera treatment centre operated at JFK Hospital by MSF Belgium were used to compare the outbreak in 2003 with the number of reported cholera cases in previous years. This centre, unlike other health facilities that provided services in Monrovia during the 2003 outbreak, has treated cholera patients for the previous four years. From June to August, a total of 2,648 cholera patients were treated in this facility, compared with 450 to 655 patients during comparable periods in the previous four years.

Appendix: Data analysis and presentation

Objectives of data analysis

- The following are objectives of analysing data:
- To identify the possible root causes of problems;
- To investigate further to verify the actual causes of a problem;
- To define needs that has not been met;
- To develop an action plan for dealing with problems;
- To improve the quality of programmes.

All data collected by whichever means—routine information system, surveillance systems, an outbreak investigation or a survey – needs to be processed, analysed and presented in a form that decision-makers can easily understand. The methods, time and resources needed to analyse data should be planned in advance. Projects can save time and effort by analysing only the priority problems being tackled by the project.

Analysing data can be simple and straightforward. Most of it can be done with a pocket calculator. Basic data analysis includes the following steps:

- Sorting the data records;
- Performing summary statistics (for numerical data);
- Summarising data into frequency tables;
- Calculating percentages and rates.

Where staff members lack the knowledge and skills for analysing data, on-the-job training should be organised with follow-up supervision. Where computers and staff with computer skills are available, Expanded Programme on Immunisation INFO see www.who.int/entity/chp/steps/resources/EpiInfo/en/index.html a public domain software might be used to set up questionnaires, store databases, perform basic and advanced data analysis and print results. Results of data analysis should be carefully interpreted and presented as tables and graphs, which are easier to understand.

Basic data analysis and interpretation

Data should be analysed and interpreted in a logical sequence. The following steps might be used to analyse data in the field:

Define the major end-results expected from the analysis

These are mortality and morbidity rates, coverage and access to food ration, water supply and sanitation.

Note: This step may have been done when planning for the data collection.

Process all data

Data on people attending health facilities or feeding centres is usually recorded directly from individual patient cards into facility registers on a daily basis. Data in these registers will usually be summarised as shown in the following table:

Table 6-24: Summary sheet for ARI survey data on 200 displaced people in camp A

Record No.	Date	Zone	Age	Sex	Weight	ARI infection
1	1/1	R	4	F	20	+
2	1/1	Q	6	F	25	-
3	1/1	S	8	F	30	+
4	1/1	Q	3	F	15	-
5	2/1	Q	4	M	15	+
6	2/1	P	4	M	20	-
7	2/1	P	11	F	40	-
8	2/1	Q	2	M	12	-
9	2/1	R	2	M	8	+
10	3/1	R	1	F	7	+
.	.	.	.	.	.	.
.	.	.	.	.	.	.
200	7/1	S	3	F	10	+
TOTAL						

Data from surveys is usually received in individual questionnaire forms. These questionnaires must be sorted by record number and date from the earliest to the most recent. The information must be recorded onto a summary sheet similar to the one shown above.

Note: All data received should be inspected for inconsistencies or for missing data and appropriate actions should be taken (e.g. verify, omit, etc.).

Analyse categorical data.

Categorical data such as age, sex, occupation, location, etc. must first be tabulated as follows:

- **Hand-tally data** from the above registers or summary sheets of observations into the corresponding box as shown below. Ensure that no observation is recorded more than once and that all the observations are contained in the table.

Table 6-25: Examples of two-way tally sheets

Example of a two-way tally sheet showing age and gender			
	Male	**Female**	**Total**
< 5	\\\\\ \\\\\ \\\\\	\\\\\ \\\\\ \	**26**
> 5	\\\\\ \\\\\	\\\\\ \\\\\ \\\\	**24**
Total	**25**	**25**	**50**

Example of a two-way tally sheet showing ARI cases by age			
	ARI +	**ARI -**	**Total**
< 5	\\\\\ \\\\\	\\\\\ \\\\\ \\\\\ \\\\\	**30**
> 5	\\\\\	\\\\\ \\\\ \\\\\	**20**
Total	**15**	**35**	**50**

- **Classify data into frequency tables**: Transfer total counts from tally sheets into corresponding *cells* (intersection of a row and a column) of empty but labelled **dummy tables** which should be prepared during the planning stage. These might be one-way or two-way frequency tables. One-way tables might be appropriate for classifying data by **PLACE**. Two-way tables might be used to classify data by **PERSON** (age and gender or other characteristics).

Table 6-26: Examples of one-way and two-way frequency tables

A one-way frequency table: Distribution of ARI cases by location					
CAMP	**P**	**Q**	**R**	**S**	**Total**
No. of ARI cases	10	30	70	40	150

A two-way table: Distribution of ARI cases by age and sex	No. of ARI cases		**Total**
	Male	**Female**	
< 5 years	50	50	100
> 5 years	10	40	50
Total	**60**	**90**	**150**

- **Calculate percentage of observations**: Divide the count in each cell by the grand total and multiply the result by 100. Percentages might be expressed to one decimal point or rounded to a whole number.

Table 6-27: Example of calculating percentage of observations

	ARI Male		ARI Female		ARI Total	
	No.	**%**	**No.**	**%**	**No.**	**%**
< 5 years	50	33.3	50	33.3	100	66.6
> 5 years	10	6.7	40	26.7	50	33.4
Total	60	40.0	90	60.0	150	100

Tables of categorical data can be used later for comparison with other data for the presentation of graphs or to carry out statistical tests.

- **Compare frequencies and percentages as follows**:

  - By **person**: compare frequency tables for gender/age (e.g. male with female, under-five with total population, etc.);

  - By **place**: compare frequency tables for different camps or population settlements;

  - By **time**: compare frequency tables with baseline or the previous month's frequencies to follow trends.

For all comparisons, ensure the population size and structures in the frequency table are similar. For example, the above results of Acute Respiratory Infection (ARI) distribution in one camp can be compared to results of another camp whose population size and structure is similar otherwise the conclusions drawn might not be valid. For details about how to compare populations with a different structure or size, please refer to the standard statistical texts.

These comparisons can also be illustrated with graphs. Information about the one-way frequency table is better understood on a spot map that shows where the disease distribution is greatest. A spot map is easily created by pushing pins on a map of the study areas. See presenting data for an example of a spot map.

Analyse numerical data
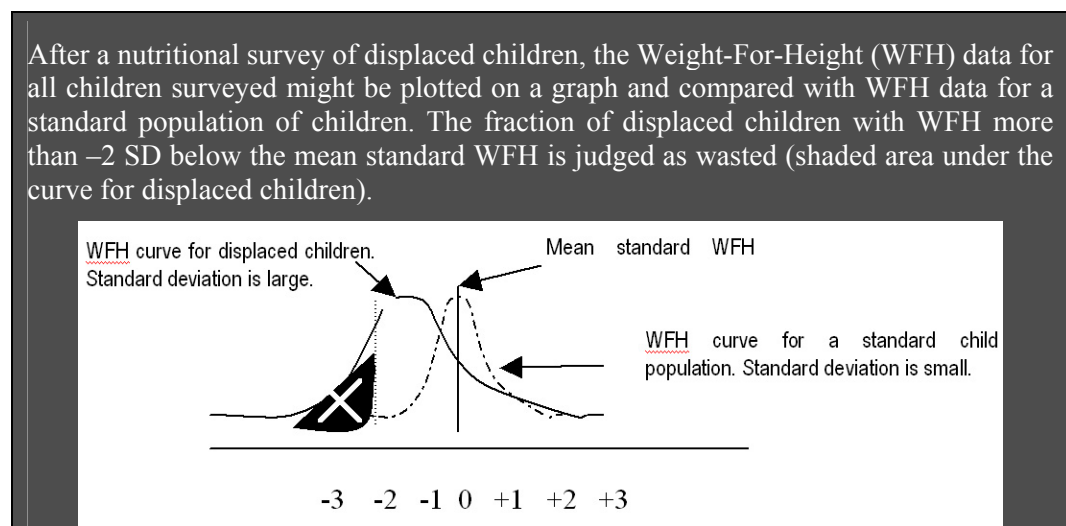
(e.g., age, weight, height, haemoglobin levels, etc.)

- Descriptive Analysis: Summarise data by defining the following:
    - **Range**—-scan the data set in each category. The range is the difference in values between the lowest and the highest observed values;
    - **Median**—-sort the data in each category from the lowest to the highest value and note the middle value that divides the data set into two equal halves. *Note: The* median *is referred to as the* mean *when the data is biased or tends to lie in one direction;*
    - **Mode**—scan the data set to identify the most common observation;
    - **Mean**—-calculate the *mean* also known as *average* by summing all the data in a category (e.g. birth weight) and dividing the total sum by the number of observations;
    - **Percentage**—-define the proportion of subjects above or below particular data categories.

Table 6-28: Examples of summary statistics

Data set for ages of 15 people with ARI infection	
Original data set	{2,21,3,1,4,2, 8,1,6,11,10} —can begin with a disorganised data set
Sort data set:	{1, 1, 2, 2, 2, 2, 3, 3, 4, 4, 6, 8, 10, 11, 21}
Age range:	1 – 21 years
Median age:	3 years
Mode:	2 years
Mean age:	(1+ 2 + 3 + 3…. + 10 + 11)/11 = 80/15 = 5.3 years
Percentage:	10/15 = 66.7% of people with ARI are below the mean age of 5.3 years

Standard Deviation (SD) describes the scatter of observations around their mean. A large SD implies a wide scatter in the observed data while a small SD implies a narrow scatter with little difference between the observations. In emergencies, the SD is commonly used to estimate the prevalence of malnutrition or to show the normal range of laboratory tests. For details on calculating standard deviation, please refer to standard statistical texts.

Figure 6-5: Applying standard deviation

After a nutritional survey of displaced children, the Weight-For-Height (WFH) data for all children surveyed might be plotted on a graph and compared with WFH data for a standard population of children. The fraction of displaced children with WFH more than –2 SD below the mean standard WFH is judged as wasted (shaded area under the curve for displaced children).

WFH curve for displaced children. Standard deviation is large.

Mean standard WFH

WFH curve for a standard child population. Standard deviation is small.

-3 -2 -1 0 +1 +2 +3

- Classify numerical data into frequency tables: Frequency tables can be used to classify numerical data under suitable class intervals. The class intervals in dummy tables might have to be revised after data collection according to the observed range of data. For example, dummy tables for a survey might have been drawn for two class intervals for age (< 5 years and > 5 years), but after the survey, the analysts might feel that they can draw better conclusions by classifying age as < 5, 5-14, 15-49, 50+ years.

Table 6-29: Population distribution by age and gender

Age	No. of males	No. of females	Total
< 5 years	20	20	40
5-14 years	45	35	80
5-14 years	45	35	80
50+ years	10	10	20
Total	**90**	**110**	**200**

Analyse indicators

- Calculate rates, ratios and proportions: Data for numerators and denominators for selected indicators can be obtained from frequency tables developed according to the previous steps. Calculate the values of each indicator (disease incidence, mortality etc.) as demonstrated earlier in this chapter.

- Compare selected indicators: Ensure the indicators being compared represent a similar population size and time period.

  - By **time**: to follow trends, compare indicators (incidence, mortality etc.) with baseline values or those from the previous week or month;

  - By **place**: to compare indicators for several locations or settlements;

  - By **person**: to compare indicators for a sub-group of the population (e.g. under-five mortality) with those of the total population or if data is available, compare indicators for two sub-groups (e.g. morbidity of male and female or of two different ethnic groups in the camp).

Interpret data

Consider normal reference values or targets when interpreting health indicators. Follow trends to determine if the situation is improving.

- *Demographic indicators*—-The following table lists the population structure of a typical developing country in percentages and ratios. The percentages can be applied to a total population estimate to define the estimates of population sub-groups when data about the displaced population is lacking or unreliable. Depending on the information in the demographic table available, the vulnerable population can also be estimated (e.g. all pregnant women, children less than five etc.). The population pyramid might also be drawn to display the age and sex compositions of a population (see the table and figure below).

Table 6-30: Population structure of a developing country

Population composition	p
Total population	100%
Infants (0-1 year)	4%
Children 0-5 years	18%
Sex ratio	1:1
Women of child-bearing age	24%
Pregnant women	5%
Expected births	4.4 cent

Figure 6-6: Example of a population pyramid

Demographic profile of
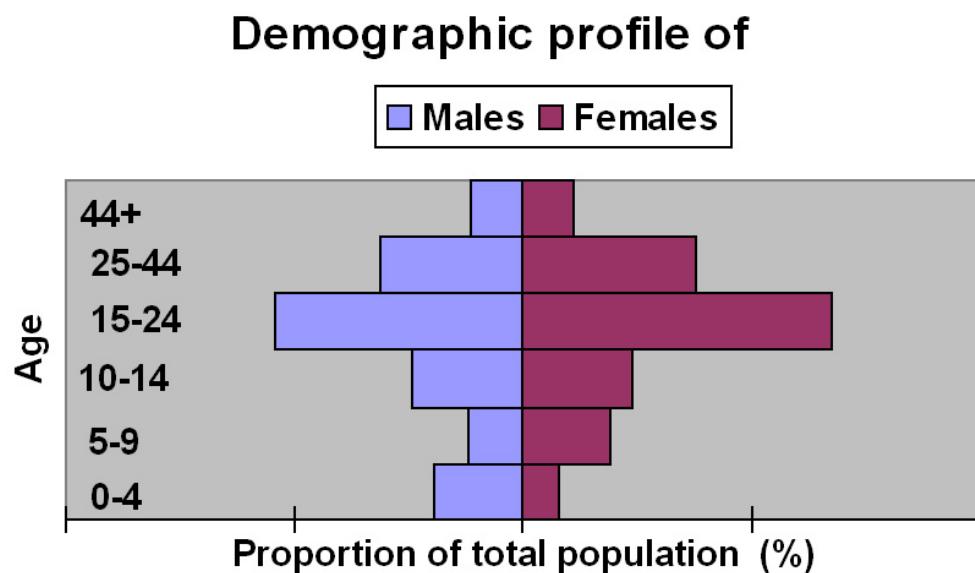
Health status indicators: Ensure the indicators being compared represent a similar population size and time period.

Mortality: The table below shows how Crude Mortality Rates (CMRs) can be used to assess the status of an emergency situation. A CMR >1 death/10,000/day implies an acute emergency situation. The crude mortality rate of displaced populations is expected to fall below 1.0 deaths/10,000/day within four to six weeks after starting a basic support programme that has provided sufficient food and water, sanitation and health care. For well run relief programmes, CMR should not exceed 1.5 times those of the host population. The baseline CMR from the initial assessment might be compared later with other CMRs to determine the effectiveness of the relief efforts.

Note: Cut-off values for the under-fives CMR are almost double the CMR for the whole population.

Table 6-31: Classifying emergency situations by crude mortality rates

Benchmarks for crude mortality rate		Indication
Total Population	**Age under Five Years**	
CMR 0.3-0.5 /10,000/ day	CMR 0.7-1.0 /10,000 / day	Normal for stable situations in developing countries.
CMR > 1.0 / 10,000/ day	CMR > 2.0 /10,000 / day	Very serious situation. Must be investigated.
CMR > 2.0 / 10,000/ day	CMR > 4.0/10,000 / day	Emergency out of control. Demands immediate actions.

Morbidity: Determine the importance of identified diseases in the following terms:

▪ How common each disease is and what the risk factors are;

▪ Whether the condition is potentially life-threatening or disabling (severity);

▪ Whether the control measures being implemented locally are effective for reducing the disease incidence, prevalence, severity or death from the disease;

▪ Whether the existing disease surveillance system is capable of detecting and monitoring the disease or if new indicators for the disease should be added.

Nutritional status: A displaced population's nutritional status might be projected from the nutritional status of children less than five years of age. Two types of indicators can be used:

▪ *Clinical indicators* of malnutrition include detection of oedema (excess fluid in tissues of lower extremities), skin changes (scaling, baggy skin), hair changes or signs of micronutrient deficiency disorders. Clinical indicators must be interpreted against anthropometric indicators.

   Note: The presence of oedema indicates severe malnutrition regardless of the Weight-for-Height (WFH) indicator.

▪ *Anthropometric indicators* are based on measurements of age, sex, weight and height. There are several anthropometric indicators, but the ones most commonly used for measuring malnutrition in children are WFH and Mid-Upper-Arm-Circumference (MUAC). The following table shows the MUAC and WFH cut off values for global and severe acute malnutrition:

Table 6-32: Cut-off values for MUAC and WFH for acute malnutrition

	MUAC	WFH	
		Percentile	**Z-score**
Severe malnutrition	11.5	<70	< -3 SD
Global malnutrition	12.5	<80	< -2 SD

Take are when interpreting findings from anthropometric surveys. WFH might be interpreted as a *percentile*, *median* or *Z-score*. For developing countries with lower 'normal' nutritional intake levels, up to 5% of children might have a Z-score below -2 Standard Deviation (SD) when compared to the reference population. Thus, relief organisations should consider that a nutritional emergency exists if more than 8% of children sampled have a Z-score below -2 SD. Finding even as few as 1% of children with a Z-score below -3 SD indicates the need for immediate nutrition interventions.

Note: See the nutrition chapter for details about calculating WFH.

After determining the global and severe malnutrition rates for a displaced population, it is essential to interpret these rates against the following factors:

▪ Morbidity and mortality rates for children under five;

▪ Time of year (e.g. harvest or planting season);

▪ Food availability and consumption;

▪ Trends in food security.

Programme process indicators

Identify any gaps in coverage and quality of services provided (food and water supplies, sanitation, immunisation, health services, etc.) by comparing the actual values of the process indicators to pre-defined targets or standards. The table below identifies where the practices and/or coverage of immunisation fall short of what would be desired or expected.

Table 6-33: Comparing standards to current practices

Set standard	Actual practice and coverage	Conclusion
80% access to immunisation	DPT1 coverage = 82%	Good practices and coverage
90% immunisation coverage	DPT3 coverage = 70%	Mixed practices and coverage
No drop-out	DPT1 – DPT3 = 12%	Mixed practices and coverage
80% Compliance	Measles = 50% Fully immunised = 45%	Poor practices and coverage
Latrine coverage: 1 per family	1 per 20-25 people	Good practices and coverage
Global malnutrition rate less than 8%	10-15% of children have Z-score < -2 SD of reference mean	Mixed practices and coverage

Graphs can also show the trends over time of the gaps between the actual practices and the set standards. Possible solutions can then be found to address the causes of gaps in service.

Programme input indicators

To assess availability of inputs consider the following:

▪ Availability of essential drugs;

▪ Daily staff attendance;

▪ Expenditures compared to budgeted amounts;

▪ Quality and use of food rations (food basket monitoring).

To assess the adequacy of inputs, check whether:

▪ Enough stocks are maintained and that the use of supplies is monitored;

▪ Minimum standards are being followed, e.g. pesticides being sprayed are safe for the user and the environment;

▪ Local skills and resources (including traditional healers) are fully used (e.g. most of the critical jobs should be assigned to the affected population).

Scan all analysis results

Before drawing conclusions about the data, scan all analysis results (summary statistics, tables, graphs, and indicators) as follows:

▪ Check that the results are:

  ▪ *Consistent*—-cross-check data gathered by different sources/methods to build a more accurate understanding of the results;

  ▪ *Convincing*—-findings should be consistent with existing scientific knowledge of disaster experiences;

  ▪ *Unbiased*—-search for systematic error at any stage of the study that produces results systematically differing from the true estimate due to selection, reporting or information bias.

▪ **Do not generalise findings from a small area to the whole population**: they might not be representative (e.g. hospital morbidity reports only represent those who use the services, not the entire population);

▪ **Look for patterns among data variables**: For example, if all children who were interviewed were weighed, check from the summary statistics and tables whether there are more ARI cases among underweight children compared to those with normal weight. Some of these patterns might become more obvious after graphing the data. Also consider the possibility of interaction between indicators (e.g. increased malaria incidence with season of the year, reduced water supply and under-five mortality, etc.).

Advanced data analysis

Sometimes, after carrying out special investigations or surveys, more advanced data analysis might be needed to determine the following:

Relative Risk (RR)

Relative risk compares the probability of disease in two different study populations: one with a risk factor and the other without. Relative risk is usually applied to longitudinal (cohort) studies.

Relative risk can be calculated by determining the ratio of the proportion of exposed individuals with the event of interest out of the total exposed divided by the proportion of unexposed individuals with the event out of the total number of unexposed. The following table and example illustrate the concept:

Table 6-34– Calculation of relative risk and odds ratio

Status	Diseased	Non-diseased	Total
Exposed	*A*	*B*	*a + b*
Unexposed	*C*	*D*	*c + d*
Total	*a + c*	*b + d*	*T*

Relative risk is:

Relative risk = [a / (a + b)] / [c/(c + d)]

For example, consider the following data obtained from a survey of incident malaria following a period of high malarial transmission. One purpose of the survey was to determine whether people who use Insecticide Treated bed Nets (ITN) have a lower risk for contracting malaria.

Table 6-35 – Calculation of relative risk for malaria among ITN
Users versus non-ITN users

Status	Malaria +	Malaria -	Total
Use ITN	20	30	50
Do Not Use ITN	40	10	50
Total	**60**	**40**	**100**

Relative risk is:

$$\text{Relative risk} = [20/(20 + 30)]/[40/(40 + 10)] = 0.5$$

This relative risk can be interpreted as follows. The risk of malaria among those who use ITNs is one-half the risk of malaria among those who do not use ITNs.

Odds Ratio (OR)

Odds ratio is used to compare the probability of having a risk factor in two different study populations: one with and the other without the disease. Odds ratio is usually calculated for case-control studies in a representative sample with results applied to the entire population.

Odds Ratio can be calculated by determining the odds of a risk factor among individuals with the event of interest divided by the odds of a risk factor among individuals without the event of interest. Table above calculates odds ratio as a cross-product ratio:

Odds ratio is:

$$\text{Odds ratio} = (a \times d) / (b \times c)$$

For example, consider the following data obtained from a community-based malaria prevalence survey. One purpose of the survey was to determine whether people with malaria are more likely to be under the age of five compared to those without malaria.

Table 6-36 – Calculation of odds ratio for age less than five among
those with and without malaria

Status	Malaria +	Malaria -	Total
Age < 5	*40*	*10*	*50*
Age ≥ 5	*20*	*30*	*50*
Total	**60**	**40**	**100**

Odds ratio is:

$$\text{Odds ratio} = (40 \times 30) / (20 \times 10) = 6.0$$

This odds ratio can be interpreted as follows. The odds of being less than age of five years are six times greater among those with malaria compared to those without malaria. Alternatively, odds ratio can be interpreted in the following way. The odds of malaria are six times greater among those less than five years of age when compared to those aged five or older.

Sensitivity, specificity and predictive values

These tools assess whether a screening test or procedure can sufficiently detect a condition or if further tests are needed (e.g. clinical diagnosis of anaemia, pneumonia, etc.).

Confidence limits

Confidence limits indicate the probability (usually 95%) that the estimate obtained from the sample will not differ from the true population rate by more than the range defined by the confidence limit. For example, in a sample of 100 individuals in which a prevalence rate of 20% is observed, there is a 95% probability that the prevalence for the whole population will lie between (20–5) = 15% and (20 + 5) = 25%.

The 95% confidence interval can be calculated using the following general formula:

Point estimate ± [1.96 × SE (estimate)]

Where the *point estimate* is the relative risk or odds ratio, as calculated above, and *SE (estimate)* is the standard error of the relative risk or odds ratio.

Referring to table 6-33, standard error for the relative risk can be calculated as follows, in the logarithmic scale: *SE (log relative risk) = √[b/(a(a+b))] + [d/(c(c+d))]*

Referring to table 6-33, standard error for the odds ratio can be calculated as follows, in the logarithmic scale: *SE (log odds ratio) = √(1/a + 1/b + 1/c + 1/d)*

Thus, the 95% Confidence Interval (CI) for odds ratio calculated above using table 4-33 is: 95% CI (log odds ratio) = log odds ratio ± [1.96 × √(1/40 + 1/10 + 1/20 + 1/30)]

Employing basic algebraic techniques, we can calculate the 95% CI for odds ratio: 95% CI (odds ratio) = exp [log 6.0 ± [1.96 × √(1/40 + 1/10 + 1/20 + 1/30)]]

Thus, the lower 95% confidence limit = $6.0 \times e^{-[1.96 \times \sqrt{(1/40 + 1/10 + 1/20 + 1/30)}]}$ = 2.44

Thus, the upper 95% confidence limit = $6.0 \times e^{[1.96 \times \sqrt{(1/40 + 1/10 + 1/20 + 1/30)}]}$ = 14.74

Using these confidence limits, we can say that the odds of malaria is six times greater among those less than five years compared to those greater than five with a 95% CI of 2.44 to 14.74. This means that true population's odds ratio would fall between 2.44 and 14.74 in 95% of all surveys conducted in a similar way among the same population.

Although not shown here, similar calculations can determine the 95% confidence limits for Relative Risk using the standard error formula given above.

Significance tests

Significance tests (e.g., Chi^2 test) are performed to establish whether two quite different factors, e.g. the diagnosis of anaemia and hookworm infection could be statistically associated, or whether the apparent relationship might have only occurred by chance. Results will be expressed as a statistical probability, where a **P-value** less than 0.05 implies association.

Significance tests can also be used to establish whether the observed differences between different study populations are real or due to chance alone. For example, following a malaria survey, a resulting P-value of less than 0.05 would indicate that there is a real difference between the spleen rates of males and females that is not due to chance factors from sampling. However, this finding should be interpreted against existing scientific knowledge about malaria transmission before drawing the final conclusion of confirming the finding or repeating the survey in another population.

The chi-squared statistic (X^2) for a two-by-two contingency table can be calculated by hand as follows:

$$X^2 = \frac{(ad - bc)^2 (a+b+c+d)}{(a+b)(c+d)(b+d)(a+c)}$$

with (r-1)(c-1) degrees of freedom.

The following X^2 can be calculated for table 6-33:

$X^2 = [(40 \times 30 - 10 \times 20)^2 (40 + 10 + 20 + 30)]/[(40 + 10)(20 + 30)(10 + 30)(40 + 20)] = 16.667$

The degrees of freedom (df) are $(2 - 1)(2 - 1) = 1$

Using a distribution table of chi-squared values (available in appendices in many statistical texts), the significance of this value can be determined. With a chi-squared value of 16.667 and 1 degrees of freedom (df), the obtained p-value would be less than or equal to 0.001. This means that the obtained Odds Ratio (6.0) is statistically significant. In other words, the higher malaria risk obtained among individuals less than five years of age compared to those aged five or more in this population is real and not due to chance.

Note: Carrying out the above-described statistical analysis procedures in detail is beyond the scope of this book. If EPI-INFO is available, it can be used to perform these tests. Otherwise, please refer to standard statistical texts for full details.

Presenting data

Data can be presented in the form of tables or graphs because they create a clearer impression than numbers alone. However, basic rules should be followed when drawing and presenting graphs and tables, such as:

▪ Neatly draw and label all presentations and include a description of the data;

▪ Present only the most essential features in graphs. Otherwise, the simplicity and clarity of the information is destroyed;

▪ Limit the number of graphs, tables, etc. because too many can be confusing;

▪ Each presentation should be of reasonable size—-not too big or too small;

▪ Use different colours/shadings/lines to increase contrast between data categories. This makes graphs easier to understand.

A few tables were shown in the previous section on analysing and interpreting data. Graphs are very useful because they help define patterns in the data. The figures below show examples of graphs:

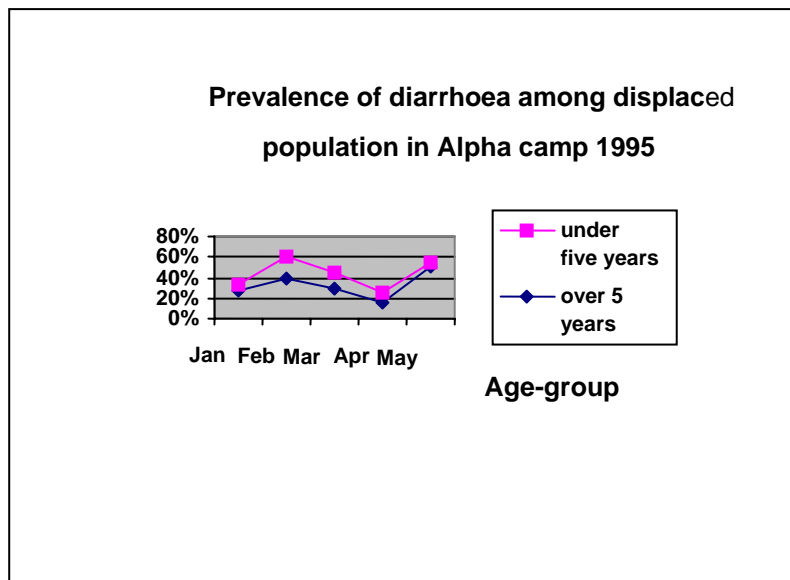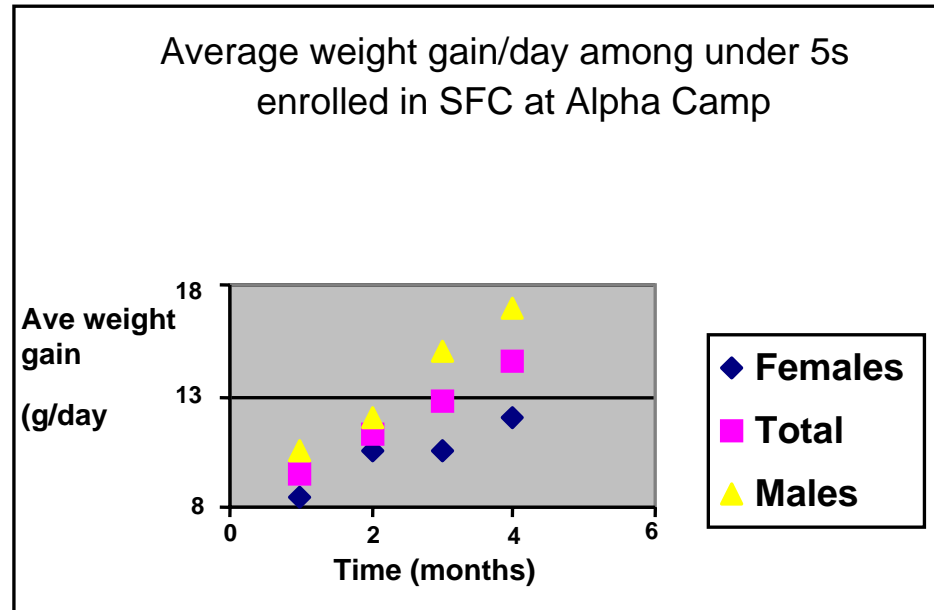**Histogram**—to show the frequency distribution of large samples of quantitative data.
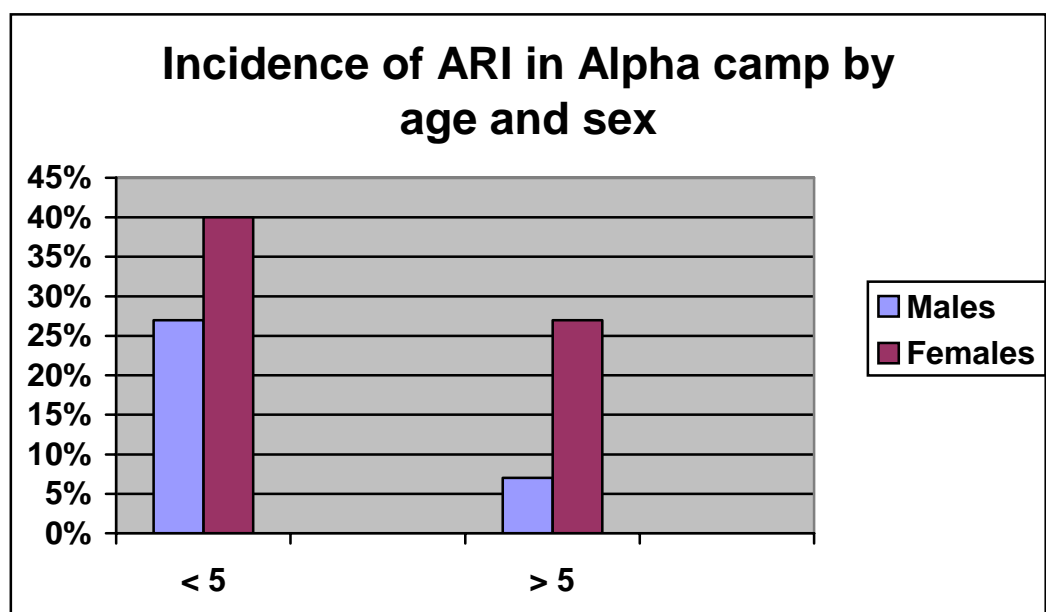
Pie chart—to show proportions of different segments of a whole, e.g. specific causes of death.
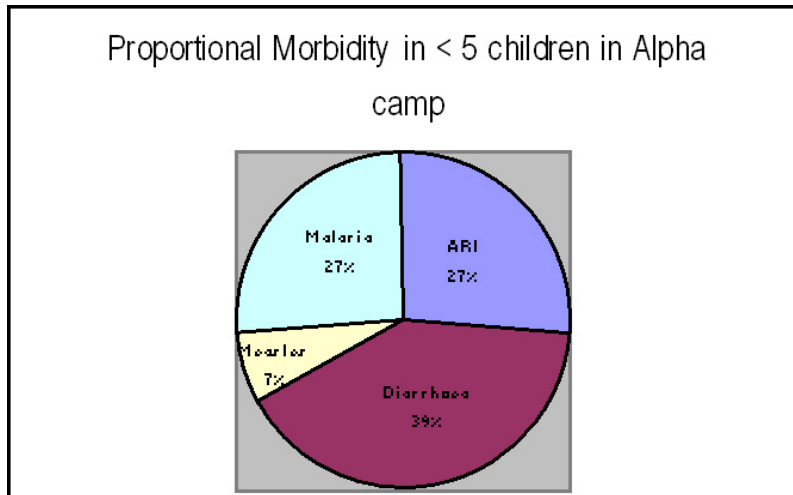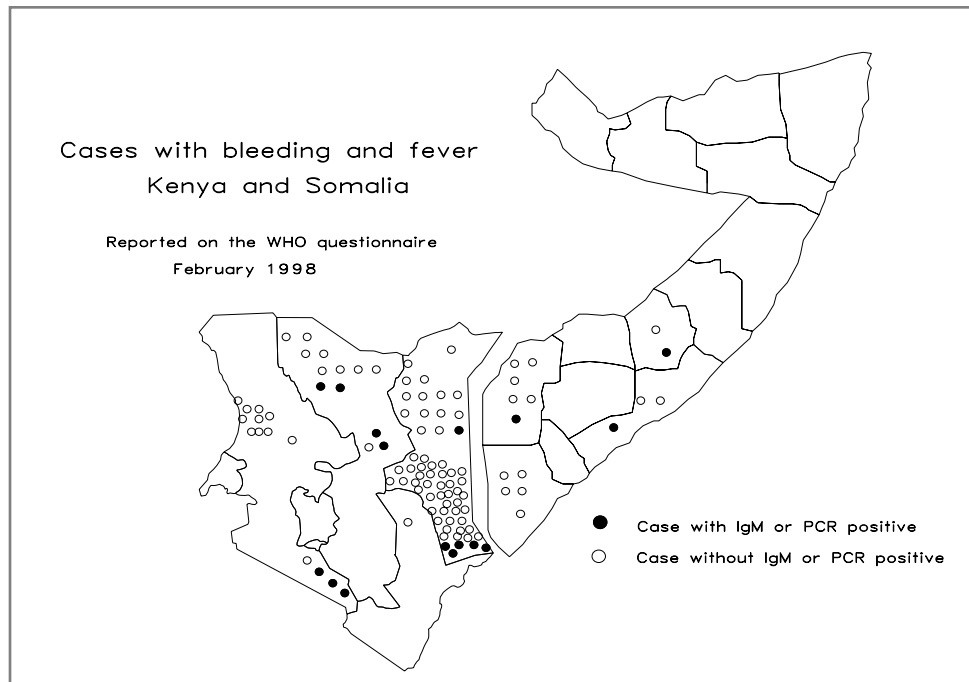

Time chart—to show trends and changes in health of the population and disease occurrence over time. The time variable is usually placed on the x-axis and the frequency or rate on the y-axis.

Scatter diagram—to show relationship between a limited number of observations.
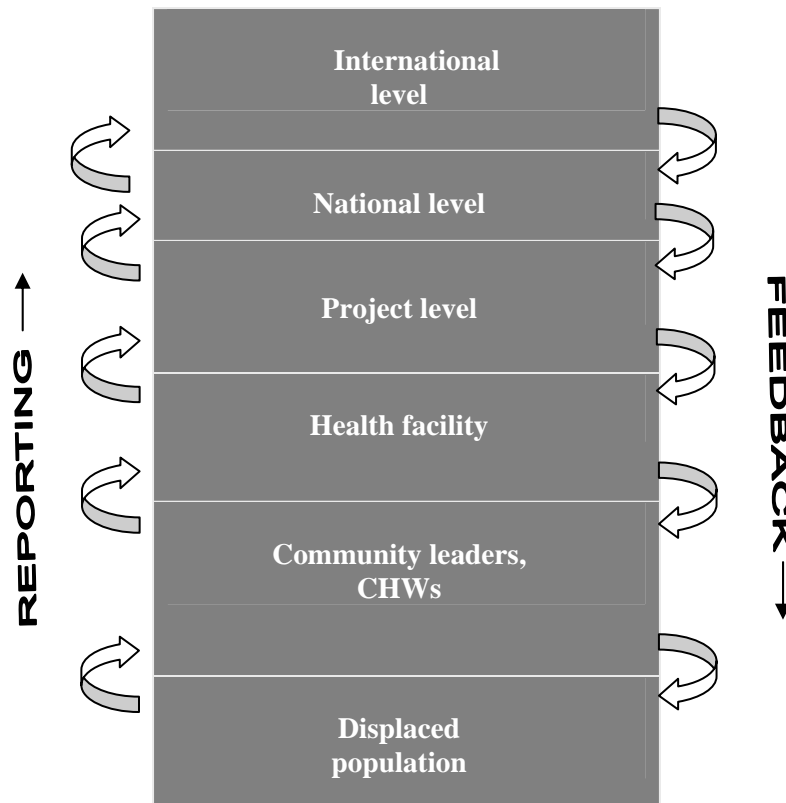

Average weight gain/day among under 5s enrolled in SFC at Alpha Camp

Spot map—to show distribution of cases within an area.[16]

Cases with bleeding and fever Kenya and Somalia

Reported on the WHO questionnaire February 1998

Communicating and using information

Figure 6-7: Flow of information in emergencies

Information in emergencies must flow two ways. The objective of surveillance, surveys, outbreak investigations and health information is not simply to collect and report data. The objective is to improve how the relief programme is managed as well as provide feedback to data collectors so that they feel motivated. Programmes also have a responsibility to distribute information to affected populations themselves. After analysing data, the results should be communicated in a form that everyone can understand. The table below gives a summary of the reports and recipients of the information.

Table 6-37: Description of different reports and recipients

Type of report	Recipient
Full detailed report for those in a position to improve situation and provide additional resources.	▪ Decision makers at the national and international level so that appropriate control measures can be organised; ▪ Agencies and service providers of similar programmes; ▪ Senior health workers responsible for data collection to improve diagnosis and management of disease cases.
Summary of report for those who gave support or helped to collect data.	Community health workers so that they will be motivated to continue collecting data.
Very brief summary of the most important findings and conclusions.	General population to be aware of health risks and to improve how they manage their illnesses at home.

This measles 'jab' will help prevent this child from the consequences of measles such as pneumonia, malnutrition, blindness and brain disease. Photo:Marko Kokic,Canadian Red Cross

Control of communicable diseases in emergencies

Description

This chapter gives an overview of common and emerging communicable disease threats among displaced populations because of natural and human-made disasters. General and disease-specific strategies for monitoring, preventing and controlling disease outbreaks are discussed.

Learning objectives

- To review communicable diseases of public health importance;
- To discuss the basic principles for communicable disease control in emergency and post-conflict situations;
- To plan a communicable disease control programme for emergency settings;
- To discuss simple but effective ways of preventing outbreaks of communicable diseases;
- To describe how to manage specific disease outbreaks in emergency settings;
- To review re-emerging and other diseases that may affect displaced populations;
- To discuss how to monitor and evaluate communicable disease control programmes.

Key competencies

- Identify communicable diseases of public health importance;
- Discuss the basic principles for communicable disease control in emergency and post-conflict situations;
- Discuss how to design and evaluate disease control programmes;
- Describe common disease control strategies including prevention, surveillance and outbreak investigation;
- Describe methods for promoting community-based and community-led communicable disease control approaches;
- Decide when to scale up and scale down disease control efforts;
- Discuss the causes, risk factors, clinical features and management of common diseases;
- Identify cases with zoonotic diseases and other re-emerging communicable diseases (such as SARS, bird flu, Ebola and Marburg) in emergency and non-emergency settings;
- Review key Monitoring and Evaluation (M&E) concepts, best practices and challenges;
- Design an M&E framework for malaria, Dengue, TB and HIV/AIDS control with standard indicators and tools;
- Explain the role of operational research and identify key areas for operational research in communicable disease control.

7

Control of communicable diseases

Introduction

Rapid and slow-onset natural disasters such as floods, earthquakes, hurricanes and droughts occur globally every year because of adverse weather conditions or poor land use. Climate change, together with population growth and urbanisation as well as ageing populations will increase the number of disasters, change the disease pattern. Furthermore, with an increased number of disasters, many governments will have an even bigger problem to recover a sense of normalcy and also cover the widening healthcare gaps due to high migration of health care staff to Europe and the US. External assistance will become even more important. Depending on their nature, duration and location, some natural disasters result in major disease outbreaks and deaths. Populations in developing countries are more disproportionately affected because of poverty, a lack of resources, poor infrastructure and inadequate disaster preparedness efforts. Communicable diseases also account for most of the reported deaths among conflict-affected populations due to displacement, malnutrition and limited access to basic needs. In addition to assessing the disease incidence and prevalence, the prevention and control of disease outbreaks require a thorough understanding of the environmental and host factors, the transmission pattern and other characteristics of causative organisms. More people are travelling more than ever worldwide; diseases and epidemics, therefore, will be more prone to spread rapidly. Communicable disease outbreaks respect no borders. Humanitarian actors must work closely with not only global bodies like WHO, Inter-Agency Standing Committee (IASC) cluster and local health authorities, but also the communities particularly when planning and implementing disease control programmes. Preferably one can prevent communicable disease outbreaks by engaging the communities and ensuring early detection and alert. Implementing disease control measures is quite straightforward provided one knows the starting point, the arrival point and how to get there. Without an effective monitoring of engaged communities and evaluation systems, measuring and reporting one's progress and the final result might be difficult. In addition, further research on the effectiveness of proposed interventions and the testing of new preventive or treatment measures will enhance national policies and guidelines as well as the reallocation of resources among various stakeholders.

Communicable diseases as public health threats

Water distribution at a refugee camp (Photo: Emily Christensen)

An epidemic is defined as the occurrence of cases of an illness with a frequency that is clearly in excess of what is expected in a given region, therefore, demanding emergency control measures. It might be preferable to report it as an outbreak because it appears to cause less panic than epidemic.

The media often reports that disease epidemics or outbreaks are 'imminent' after natural disasters such as flooding, hurricanes and earthquakes. However, humanitarian actors should not necessarily rely on what is reported by the media or other channels since there are common patterns in various types of disasters. Lessons learnt from similar situations can be used to predict when and which diseases are likely to cause epidemics. Outbreaks of diarrhoeal diseases have been reported after natural disasters particularly in developing countries with limited resources. However, disease outbreaks or epidemics do not occur spontaneously unless certain

factors are present to promote disease transmission in the local environment. Large-scale displacement is a key factor contributing to disease outbreaks after a natural disaster particularly among populations that are very poor and greatly lack access to basic needs such as food, shelter, safe water, sanitation and health care including vector control measures.

Disease outbreaks, rather than trauma, have also been the major cause of deaths in emergency and post-conflict situations, sometimes raising baseline death rates sixty times (Lancet, M. Connelly et al). Over the past decade, the top killers in most complex emergencies (apart from many deaths related to pregnancy and childbirth) have been malaria, diarrhoeal diseases and pneumonia with TB and HIV/AIDS gaining increasing attention more recently.

During the acute emergency phase, over 40% of deaths in camp situations are caused by diarrhoeal diseases, 80% of them among children below two years of age. Similar patterns occur in post disaster situations, where there are no camps at all. Because measles epidemics have declined since the 1990s, they are often overlooked in disasters. Yet wherever there is a major population displacement, there are see outbreaks even in countries claiming up to 90% immunisation coverage. Several conflict-affected countries reportedly have measles coverage below 50% and widespread outbreaks have been reported in Ethiopia, Democratic Republic of Congo (DRC) and Afghanistan. An estimated 30% of the 1 million deaths due to malaria occur annually in conflict affected countries in Africa and a massive malaria epidemic is reported to have affected 2.8 million among Burundi's population of 7 million people.

There is now evidence that malaria patients are more prone to acquiring HIV infection and vice versa. In 2002 during the dry season, several meningitis outbreaks were reported beyond the traditional meningitis belt into Rwanda, Burundi and Tanzania. Other diseases may become a bigger problem during the post-emergency phase. Over 80% of refugees originate from or settle in countries with a high burden of TB. Poor Directly Observed Therapy Short Course (DOTS) implementation might increase the risk of multi-drug resistant TB while the spread of HIV has reversed the declining epidemiologic curve. Many HIV-endemic countries in sub-Saharan Africa report more than 50% of TB patients have HIV and the situation is worsening due to the emergence of a new strain of Extreme Drug Resistance TB (XDR TB) that is not responsive to routine anti-TB treatment. Finally, every year up to four emerging bacterial and viral infections emerge, contributing to the global threat for pandemics. Some of them are not viscous, but others are associated with high case fatality rates such as SARS, bird flu and viral haemorrhagic fevers.

Experience has shown that the risk of disease outbreaks and deaths during natural disasters and complex emergencies might be minimised through early introduction of disease surveillance, epidemic preparedness, effective prevention and control including case management. Early detection, reporting and response are vital to limit the spread of outbreaks and epidemics. Failure to implement timely, effective and coordinated measures might result in the following:

▪ Re-emergence of old disease threats (malaria, TB);

▪ Outbreaks of changed disease patterns (e.g. malaria, meningitis, yellow fever, chikungunya, Dengue);

▪ Outbreaks due to changed vulnerability such as heavy urbanisation with more shanty towns (West Africa, India, Latin America and others);

▪ Further spread of neglected diseases (such as Guinea worm, cholera, leischmaniasis, sleeping sickness, leprosy, etc.);

▪ High morbidity and mortality from delayed epidemic detection and response (e.g. dysentery, meningitis);

▪ Emergence of a few 'super bugs' which are resistant to all antibiotics. They were limited to hospitals previously, but are now circulating in communities;

- ▪ Emergence and spread of new pathogens and diseases (e.g. monkey pox in DRC, SARS, Nipah, bird flu);
- ▪ Persistence or even spread of diseases targeted for eradication (polio, leprosy, Guinea worm).

# Principles of communicable disease control

A communicable disease is defined as an illness that arises from transmission of an **infectious agent** or its toxic product from an infected person, animal or reservoir to a **susceptible host**, either directly or indirectly through an intermediate plant or animal host, vector, or environment.

Note: Communicable and infectious have the same meaning; both terms are used interchangeably throughout this chapter.

Basic principles

A disease epidemic or outbreak occurs when there are more people suffering from a particular illness than what would normally be expected. Therefore, emergency control measures are needed. It is incorrectly assumed that 'epidemics and plagues are *inevitable* after every disaster.' The threat of communicable disease outbreaks *is* greater after a disaster than in non-emergency situations particularly when large populations have been displaced. However, an epidemic or outbreak will only occur if the equilibrium is changed between the population's *susceptibility* (host or reservoir), the *virulence* of the infectious agent (bacteria, viruses, parasites, or fungi or their products) and the environment that promotes the exposure are upset (refer to Figure 7-1 below).

Figure 7-1: Equilibrium between the population, infectious agent, and the environment
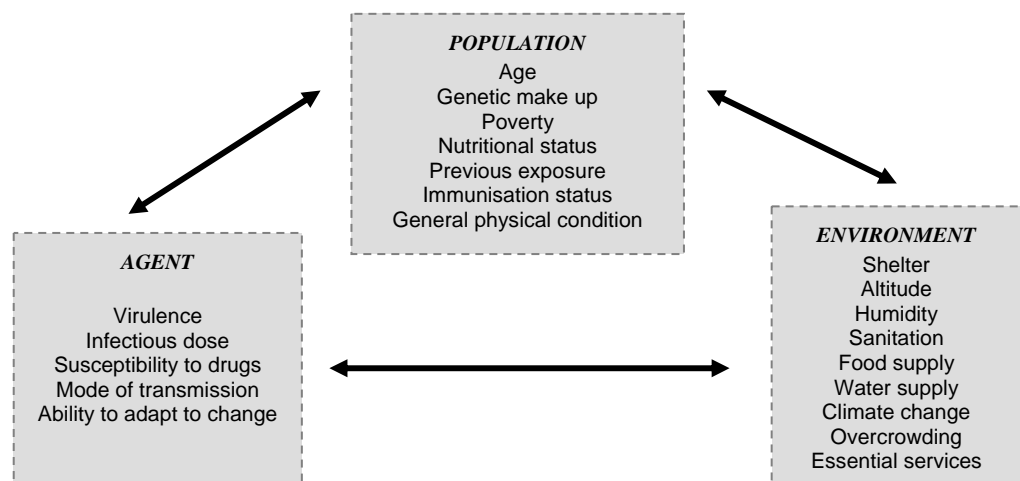
Although each emergency situation is unique, all emergencies are surrounded by the same factors that can upset the balance between the infectious agent, the host and the environment, as follows:

Agent

Infectious disease agents are constantly developing where it is possible to multiply most easily either in susceptible persons, vectors, animals or in the environment. Because their genes are mutated/changed at random quite rapidly, new features appear that might be better adapted to the environment and able to spread to new locations, disappear to re-appear and infect more vulnerable populations. Some infectious agents cause higher rates of illness and death because they have become resistant to available treatment (e.g., TB, malaria) or are more virulent, leading to major outbreaks (e.g. Shigella, Ebola, SARS).

**Note*:* A disease outbreak will not occur if an infectious agent of a particular disease is not present in the environment and is not introduced after a disaster, even if environmental conditions are ideal for transmission.

Population

Displaced persons might change the local environment or bring new or different strains of infectious agents. Displaced persons might also have low immunity to infections caused by a poor physical or nutritional status, underlying diseases or poverty. Certain individuals are more vulnerable to infectious diseases or the more severe form of the illness. Immunity deprived persons like those with poor nutrition, TB or HIV are an example. Children less than five years of age (usually about 20% of the displaced population) and the elderly are at the greatest risk of morbidity and mortality from infectious diseases particularly the malnourished. Initial assessment and ongoing surveillance is critical to identify the most at risk groups so that they can be protected.

Environment

Opportunities for infection might increase because of overcrowding, unhygienic conditions, a lack of safe drinking water, climate change, insecurity etc. Essential public health or medical services might also have been inadequate before the disaster and, subsequently, disrupted or overwhelmed by the emergency situation as a result of the breakdown of the health infrastructure and displacement of skilled health workers who might also experience a loss of family, property etc. Large population movements from one malaria endemic area to another might increase the risk for severe malaria among the displaced as well as the host population if the malaria species affecting the two populations are somewhat different.

Note: Because communicable diseases respect no boundaries. Outbreaks occurring within the displaced population can spread to the host population, and vice versa. The above risk factors can apply to either population.

The probability of communicable disease outbreaks occurring depends, therefore, on the type of infectious agents existing within the local environment and the displaced population's physical condition and health status. Sometimes it is easier to undertake control measures for disease outbreaks that affect a closed settlement such as a refugee or Internally Displaced Persons camp. Unfortunately for most epidemics related to natural disasters, people are not always in camps but dispersed within a host population. Targeting high risk persons in such a mixed setting might be challenging. Extreme poverty can also force these high risk groups to eventually move to camp settings thus increasing their vulnerability.

Communicable disease cycle

Communicable diseases do not always develop in the same way in susceptible hosts. Some diseases produce more non-clinical cases that experience vague, non-specific symptoms or none at all (e.g., TB, cholera, polio) and thus spread the disease without being aware. Other diseases produce more clinical cases with easily detectable symptoms (e.g. measles). However, once exposed, people with as well as people *without* clinical or

biological signs of infection are capable of spreading the disease to other susceptible persons. Such people are known as **carriers**. The figure below illustrates the cycle of communicable disease progression in susceptible hosts/persons. Understanding the unique pace of specific communicable diseases through the cycle helps to identify those individuals that are likely to transmit the disease as well as those at greatest risk of becoming ill or dying within the population.

Figure 7-2: The communicable disease cycle
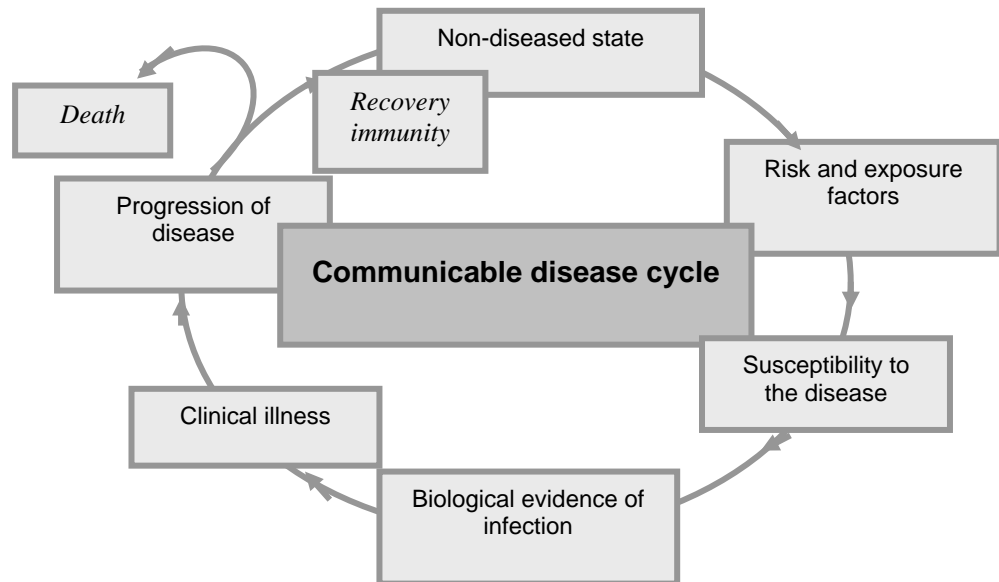
Some diseases spread very rapidly (within a few hours), while other diseases spread insidiously, triggering a range of effects that might be felt on a wider scale. For example, cholera spreads rapidly and within a very short time, the whole community has been exposed. The opposite situation is that although less than 5% of a population might be infected with HIV, the effects will gradually spread from the individual and household levels to the community. Because People Living with HIV (PLHIV) infection progress from the asymptomatic phase to develop opportunistic infections, then AIDS and finally succumb to death, they might leave behind many other HIV infected family members and AIDS orphans. Analyzing each stage of a particular disease progression together with other sectors helps identify all possible points for disease control both more holistically and comprehensively.

General approach to setting up disease control programmes

Designing a disease control programme

The aim of disease control programmes (prevention and treatment) is to reduce excess morbidity and mortality by limiting the spread of diseases of epidemic potential. Proposed interventions will usually include adequate quantities of safe water, sanitation, nutritional services, reproductive health, food aid/food security, shelter and basic clinical care. In addition to considering the effectiveness, feasibility, cost, and speed of implementation of proposed intervention, it is important to consider how it will be integrated within the overall response as well as the culture and behaviour of target populations. A disease control programme may be designed using the approach described below.

Assessment

Rapid assessment

During the first days and week after a disaster, information is confusing, inconsistent and incomplete. Decisions have to be made based on incomplete data, prioritising and deciding where the needs are highest. Partially informed decisions must later be adjusted. Some organisations insist on waiting endlessly for more information and data, thus hampering vital decisions. It is better to work in consultation with the local government and other emergency responders to facilitate information sharing. If an Inter-Agency Standing Committee health cluster is established, this is the ideal forum to facilitate collection and sharing of information and subsequent data analysis. Many agencies are reluctant to share their data for various reasons. As soon as a rapid assessment has been carried out, it is important to keep the agency headquarters posted, while starting to mobilise the necessary staff, drugs and equipment.

In depth assessment

Within the shortest possible time and based on information priorities from the rapid assessment, in-depth assessments might be necessary. Planning a more comprehensive disease control programme must be based on these in-depth assessments. Gathering essential background information on the burden of communicable diseases and factors influences the outcome of common diseases. Other very important elements of disaster response to be included in a rapid assessment for communicable disease control include: psychological trauma and maternal and infant mortality and morbidity. These are well-covered in other chapters. The following table provides a summary of the critical information that needs to be gathered during the assessment.

Table 7-1: Background information needed for planning disease control programmes

- Demographic composition of the displaced population;
- Annual disease incidence rates of common diseases in the place of origin;
- Annual disease incidence rates of common diseases in the host country. Note that government's Health Information Systems are often unreliable and incomplete;
- Disease control policies in the place of origin are often not well known or well practiced;
- Disease control policies in the host country, are often not well-known or practiced;
- Standard case definitions and treatment protocols are often not well known and hard to get. Use WHO standards until further notice;
- Especially TB and HIV/AIDS policies, guidelines and protocols must be carefully evaluated and put into context. They often corresponds to WHO standards, but equally often not implemented in full. (lack of resources);
- Performance of specific disease control programmes in the place of origin;
- Performance of specific disease control programmes in the host country;
- Women's status and functions in families and communities;
- Displaced population's knowledge, cultural beliefs and treatment of communicable diseases;
- Knowledge and experience of health workers in the control of communicable diseases;
- Resources available for implementing a communicable disease control programme ;
- Capacity of local institutions and NGOs to implement a disease control programme;
- The local population condition and needs.

After an in-depth assessment, representatives from the relief agency, the host authorities and the affected community might use the findings to plan an appropriate communicable

disease control programme in a coordinated manner. If the host government cannot lead the process, a health cluster or other capable agency may be appointed to ensure good coordination.

Recovery assessment

Some long-term approaches may be explored during an in-depth assessment. The challenge is whether to include the health needs of the local population if this is the government mandate, unless really necessary. Another challenge is to decide whether the assistance should cover only the needs and gaps of services caused by the disaster or to address apparent needs present before the disaster. In particular, this will become more of an important issue as disasters become more frequent allowing less time for recovery between disasters and few opportunities for preparedness and reconciliation.

Select priorities

Because it is often impossible to carry out all the actions recommended by the assessment team, planners must determine what the priority interventions are. Specific criteria can be used to rank different public health measures and determine the top priorities for a relief operation. Suggested criteria include the seriousness of a problem (whether it is associated with high morbidity and mortality), the ease of implementation (which depends on the specialty or mandate of an agency), the availability of resources (human, financial etc.). The following table illustrates how interventions for top killer diseases in an emergency situation (Acute Respiratory Infections (ARIs), diarrhoea, malaria, measles and motherhood diseases) are ranked.

Table 7-2: Ranking public health measures

Public health measure	Seriousness of problem 1 = minor 3 = major	Ease of implementing 1 = difficult 3 = easy	Availability of staff 1 = few 3 = many	Cost of implementing 1 = high 3 = low	Agency capacity 1 = low 3 = high	Overall score
ORT for dehydration	3	3	3	3	3	**15**
Sanitation – build latrines	3	2	3	2	2	**12**
Ensure access safe water via treatment and protecting sources	3	3	2	2	2	**12**
Supply/treat mosquito nets, spraying	3	1	2	3	2	11
Measles immunisation	3	3	2	3	2	**13**
Ensure basic shelter	3	3	3	2	2	**13**
Reproductive health	3	2	2	2	2	11
Control TB via DOTS	2	1	1	2	2	**8**

The above exercise ranks Oral Rehydration Therapy (ORT), measles immunisation, shelter, safe water supply and building of latrines as the priority measures for an initial relief operation.

Define the goals, objectives and strategies for disease control

The ultimate goal of communicable disease control programmes is to identify risks and prevent excess mortality among the displaced population by preventing and managing outbreaks of communicable diseases. Even though preventive measures might prevent most of these deaths by reducing the incidence of disease outbreaks, they might not successfully prevent all outbreaks. If possible, prevent the outbreaks even from occurring and equally important is to be prepared to manage the outbreaks that do occur.

Goals

- **Prevent** excess morbidity and mortality due to communicable diseases;
- **Reduce** the morbidity, mortality, and transmission of communicable diseases.

Objectives

The overall objective of an emergency response is to achieve a crude mortality rate of <1/10,000/day and an under-five mortality rate of < 2/10,000/day as soon as possible. Alternatively, the overall goal may be to reduce the Crude Mortality Rate to normal levels when it has doubled.

Specific objectives for disease control programmes might vary according to the disaster situation and whether the period is emergency or post-emergency phase. Examples of an emergency phase's objectives are:

Emergency phase:

- Immunise more than 90% of all children in the target group for measles;
- Reduce the incidence of acute respiratory infections to pre-disaster levels in three months;
- Keep the case-fatality rate of acute watery diarrhoea/cholera at less than 1%;
- Halve the burden of severe malaria cases;
- Reduce maternal, neonatal and infant mortality rates by 25%.

Examples of a post emergency phase's objectives are:

- Ensure that at least 85% of identified TB cases are cured and to detect at least 70% of existing cases;
- Double the number of people with comprehensive HIV knowledge and access to preventive measures (condoms, counselling and testing and nutritional counselling for the HIV infected).

Strategy

Because of limited resources, communicable disease control programmes should focus mainly on diseases that cause the highest morbidity and mortality. During the acute emergency phase, the priorities of the disease control programme might be limited to addressing basic food, water and shelter needs, carrying out surveillance for the top three or five diseases and providing basic treatment for acute illnesses. If possible, the data should be disaggregated by gender and age (simply below five and above five years of age). Once the emergency phase is over, an in-depth assessment should be carried out. In disaster prone areas, it is important to realise that interventions do not start from scratch. Some control measures might have existed before the disaster and responders must capitalise on that. For example, there are often local government officials, volunteers and local or international agencies on the ground that can together bring some experience with local disease prevention as well as preparedness efforts. However, these local services are often not adequate for controlling a sudden increase in common diseases especially epidemics. External support is nearly always needed and if there is evidence of increasing problems due to other diseases, additional control measures might be considered.

However, carrying out additional control measures should be coordinated with the government, the Inter-Agency Standing Committee health cluster or the agreed coordinating body, to make best use of resources and the future plans for the assisted population.

The following table summarises examples of disease control strategies for the acute and post-emergency phase.

Table 7-3: Examples of disease control strategies for emergencies

Communicable disease control strategies		
	Before outbreaks or epidemics	**Action plan during outbreaks**
Preparedness	▪ Agree on who is in charge, roles and responsibilities; ▪ Establish Plan of Action for tackling the and outbreak; ▪ Measles (vaccines, syringes, surveillance); ▪ Volunteers, peripheral health staff, outreach workers trained and prepared; ▪ Put surveillance system in place using communities and volunteers specifically; ▪ Assess and map clinics, operational status, capacity; ▪ Map water sources, food stalls, restaurants, sanitation, slaughter houses and transport routes in and out of the area(s); ▪ Availability of essential drugs and Inter Agency Emergency Health Kits for Acute Watery Diarrhoea/Cholera (ORS, Chlorine, training of volunteers, awareness, Cholera kits available); ▪ Acute Respiratory Infections (ARIs) (tents, shelter available; ▪ Tetanus (TT, sera available); ▪ Malaria (nets, sprays, RDT material, correct drugs available); ▪ Reproductive Health (Minimal Initial Service Package (MISP) Kits available); ▪ Referral system established ▪ Health care staff trained;	▪ Confirm who is in charge, roles and responsibilities; ▪ Limit the spread, take precaution in neighbouring areas, check transports in and out, and implement the 'Before outbreaks or epidemics' scheme in those areas; ▪ Further train and use volunteers to detect cases; ▪ Further train volunteers in community awareness and in vaccination campaigns; ▪ How to enhance existing basic health care services, how the health information system should be managed; ▪ Sanitation (hygiene promotion, latrines, waste management); ▪ Safe and sufficient water supply; ▪ Provision of soap; ▪ Adequate food and nutrition; ▪ Adequate Shelter; ▪ Basic health care and referral of emergencies; ▪ Safe mother hood and safe deliveries; ▪ Immunisation for measles;

	Before outbreaks or epidemics	Action plan during outbreaks
Preparedness	▪ Establish functioning sanitation system and safe and sufficient water supply; ▪ Undertake appropriate vector control; ▪ Provision of soap; ▪ Ensure adequate food and nutrition; ▪ Protection from environment (Shelter); ▪ Basic health care and referral of emergencies; ▪ Health education on Reproductive Health (especially STDs and HIV); ▪ Monitor for Gender Based Sexual Violence (GBSV); ▪ Immunisation for measles (< 5s).	▪ Expand immunisation efforts (measles for < 15 years, meningitis for certain areas); ▪ More aggressive vector control e.g. IRS (Indoor Residual Spraying); ▪ TB treatment under special conditions; ▪ Meningitis immunisation under certain conditions; ▪ Prophylaxis (e.g. cholera, malaria).
Containment and case management	Continue Prevention, including among host population or neighbouring areas: ▪ Clinical diagnosis; ▪ Basic diagnostic capacity with Rapid Diagnostic Tests (RDTs) or microscopy; ▪ Use referral laboratory *; ▪ Use Inter Agency Emergency Health Kits (IEHK) basic modules for peripheral basic care and complementary for Health Centres and Hospitals.	▪ Establish Contingency plans; ▪ Diagnostic and treatment algorithms, e.g., IMCI** ; ▪ On-site laboratory for malaria smear, stool ova/cyst, haemoglobin, gram stain, sputum smear, blood sugar, HIV test. (blood typing and transfusions also possible); ▪ Essential drugs and supplies (stratified for different levels).
Surveillance	Monitor illness and death due to: ▪ Most common diseases (ARIs, diarrhoea measles, malaria, in MCH); ▪ Health information systems capable of providing early detection of epidemics like Acute Watery Diarrhoea/cholera, malaria, meningitis.	Monitor illness and death due to: ▪ Most common diseases; ▪ Skin and eye infections; ▪ Urinary tract infections and sexually transmitted diseases (STDs); ▪ Parasitic infections; ▪ TB, HIV; ▪ Malnutrition and micronutrient deficiencies; ▪ Pregnancy and childbirth and other reproductive health problems.
Lessons learnt, building better systems for future	▪ Constant monitoring, reviews and evaluations.	▪ Experiences of all parties and at all levels to discuss improvement; ▪ In-depth evaluations.

An on-site laboratory may be set up in the acute phase if there is a major disease outbreak or high drug-resistance (malaria, dysentery)

** *Integrated Management of Childhood Illnesses (IMCI)*

Develop a plan of action

During the first phase, a couple of days or one week, action based on the available data and information, which often is incomplete or probably inaccurate, must be taken. Major decisions have to be made on a daily basis under these conditions and, essentially from the humanitarian assistance efficacy point of view, it is better to be >50% right than being completely wrong i.e. waiting for decisions because there is no data. Such decisions have to be combined with how disease patterns have developed in similar past situations. Despite a very high workload in this intensive period, a plan of action prioritising actions in areas of concern and a plan for key interventions for controlling diseases that are likely to cause high morbidity and mortality must be started. An example of a plan of action is shown below:

Table 7-4: Example of a plan of action for prevention and control of common diseases

Disease	Target group	Confirmation	Preparedness	Outbreak control/ prevention	Treatment	Common errors
Acute Watery Diarrhoea (AWD)	Young children	History/ physical examination	Obtain ORS Train volunteers, staff Raise community awareness about serious signs etc	Improve sanitation and hygiene ORS widely available	Rehydration Knowledge how and when to use Oral Rehydration Salts (ORS) or Therapy (ORT)	Over emphasis on IV fluids Scepticism on ORS – It is not a "DRUG" Belief that antibiotics are needed
Acute Respiratory Infections (ARIs)	Young children	History/ physical examination	Create awareness, obtain antibiotics, train staff handling and referral of severe cases	Improve shelter conditions	Antibiotics	Seeking medical care/ doctor too late Limited access to clinic Not affordable
Measles	Young children	Diagnosis by experienced health worker	Vaccination, how to trace contacts	Mass immunisation campaign* Vitamin A	Treat cases, supplementary feeding	Waiting for outbreak to occur
Malaria (Falciparum, vivax)	Young children, pregnant women and all non-immunes	Blood smear, Rapid diagnostic tests ("dip sticks")	Surveillance, understand disease pattern Procure diagnostics and treatment	Mosquito control, nets and spray	Effective anti-malarial drugs	No surveillance, failure to confirm illness
AWD/ Cholera*	AWD mainly affects children, cholera affects also adults	Stool culture, diagnostic sticks	Surveillance Procure ORS,IV fluids & chlorine	Improve sanitation, water supply, hygiene	ORS, antibiotics*	Seeking medical treatment late Delayed confirmation of cholera outbreak

* Might be carried out too late.

*2 **Note:** Cholera confirmation can be very elusive, and that for various reasons. Competent laboratory may be not easily available, and sometimes, the government is reluctant to declare a cholera outbreak, which may have serious implications on tourism,

business etc. Any AWD outbreak with mortality amongst adults must be considered as highly suspicious for cholera and action should be taken accordingly, even before cholera confirmation has been received.

*3 Antibiotics have little proven value, except in reducing the number of days of diarrhoea and the severity.

Communicable diseases do not discriminate between the displaced and host populations, therefore, national health authorities must be involved in planning and implementing the communicable disease control programme. The following areas should be agreed upon:

- Linking the disease control programme for displaced people with the national programme;
- Common treatment protocols to be used;
- Coverage of the local population in the communicable disease control programme;
- How and when to refer seriously ill people to local or temporary field hospitals;
- If possible, use host country referral laboratories, mission hospitals or others reference laboratories outside the country;
- Supply of essential drugs and laboratory re-agents for health facilities of the displaced and also the local population;
- What to do with already diagnosed chronic diseases. Refer them if possible. Do not start up treatment, if the patient cannot continue after the emergency care is terminated;
- How to follow-up on displaced persons with chronic diseases after repatriation;
- Disease surveillance and programme evaluation.

Estimate resource needs

A communicable disease control programme might require a significant amount of resources including infrastructure (e.g. special treatment centres), drugs and medical supplies, staff (for surveillance, health care and disease control), laboratory equipment and supplies, diagnostic and treatment guidelines, stationery, and transport.

- *Prevention*—Raising community awareness and mobilizing them to undertake simple preventive measures like personal hygiene, using bed nets if available and how to recognise and refer suspected cases. This calls for prior training of volunteers to detect suspected cases, report and initiate basic acre and sometimes to provide basic treatment (such as Oral Rehydration Salts (ORS);

- *Emergency treatment centres* – Special treatment centres, e.g., ORS corners, cholera treatment centres, TB manyattas (huts) and Shigella centres might be needed to improve treatment and limit the spread of diseases by infected persons. If the capacity of existing facilities is too little, temporary facilities equipped with adequate staff and supplies can be established in huts, school buildings or tents. The communities, health workers and caregivers should have facilities for hand-washing and also for disposing of excreta or other human waste;

- *Trained manpower* is often a major obstacle to deliver even basic care. Hiring locally available doctors and nurses simply depletes the local health care system of its most valuable asset in other localities. To estimate specific staffing needs, please refer to the Sphere Standards;

Angola cholera outbreak June 2006- Barrels of chlorine were distributed to cholera treatment centres. Photo: Tapiwa Gomo/International Federation

- *Drugs and medical supplies* – When selecting drugs and medical supplies, consider the host country treatment protocols. If not available, use WHO's recommended treatment regimens. WHO's guidelines or essential drug list defines the specific

drug dosages and patient treatment categories for the priority diseases. The amount of drugs and medical supplies needed might be estimated as follows:

- Calculate the drug requirement per patient for each disease;
- Estimate the number of expected cases, based on the assessment data;
- Estimate the number of expected patients in each category;
- Avoid syrups and injectables as much as possible because they can cause great logistical problems;
- Calculate the total drug requirements;
- For tablets that can be broken add 10% for children and for possible waste;
- Add 50% for reserve stock.

Note: It is important to assess possibilities for safe local procurement of drugs—in the quantities and quality that is required—and if not possible, what is needed to import. Advance procurement of Interagency Emergency Health Kits (IEHKs) for starting up emergency operations saves time. They are prepared and ready for dispatch and kept by many suppliers in Europe.

Note: When importing drugs or accepting donations, the Interagency Guidelines for Drug donations should be followed. According to these guidelines, only drugs that are registered in the country of operations can be imported.

Note: Pre-packaged drug kits have been developed that might be used during the initial phase. If patients see that the drugs are effective, other patients might be encouraged to get treatment. IEHK is designed to treat 10,000 persons with common illnesses during the first three months of an emergency situation. It consists of ten basic units and a supplementary unit. (See the health system chapter for more details on the IEHK). The basic units can be ordered separately and used by people with no training in health.

Note: Host government employees, i.e. doctors, have different prescription habits, often practice multi-pharmaceutical approaches: e.g. often two or more antibiotics are prescribed for an infection and preferably, of the latest fashion—and expensive. Such practices rapidly deplete stocks and financial resources.

Define standards and indicators for monitoring the programme

Setting standards of performance is essential to ensure that the disease control interventions are appropriate and of acceptable quality. Some host governments might have some standards or they might have adopted WHO standards or supporting Non-Governmental Organisations (NGOs). The Sphere Project Minimum Standards for all sectors might also be applied for the planning and evaluation of communicable disease control programmes where there are inappropriate or no standards. Progress in achieving standards in one sector often influences and even determines progress in other sectors. The disaster-affected communities' participation in the selection, implementation, monitoring and evaluation of standards for communicable disease control is essential. The following table defines the recommended minimum standards for the prevention and control of communicable disease threats during natural disasters and complex emergency settings.

Table 7-5: Minimum standards for communicable disease prevention and control[33]

Intervention	Minimum standards	Target diseases
Shelter and site planning	Existing shelter and settlement solutions are prioritised via the return of hosting of disaster – affected households and the security, health, safety and well-being of the affected population are ensured.	Diarrhoeal diseases, ARI, meningitis, TB, HIV
Water supply	All people have safe and equitable access to sufficient quantity of water for drinking, cooking and personal and domestic hygiene.	Diarrhoeal diseases, typhoid, scabies
Sanitation and hygiene	People have adequate numbers of toilets, sufficiently close to their dwellings to allow them rapid, safe and acceptable access at all times of the day and night; Each disaster-affected household has access to sufficient soap and other items to ensure personal hygiene, health, dignity and well-being.	Diarrhoeal diseases, polio
Food safety	People have access to adequate and appropriate food and non-food items that ensures their survival, prevents erosion of assets and upholds their dignity; Food is stored, prepared and consumed in an appropriate manner at both the household and community levels; Moderate and severe malnutrition is addressed.	Top killer diseases since malnutrition increases risk of disease
Health education	People have access to information and services that are designed to prevent the communicable diseases that contribute most significantly to excess morbidity and mortality.	Diarrhoeal diseases, malaria, Sexually Transmitted Infections (STIs), TB, HIV
Health services	All people have access to health services that are prioritised to address the main causes of excess mortality and morbidity; People have access to clinical services that are standardised and follow accepted protocols and guidelines; All children aged 6 months to 15 years have immunity against measles.	All diseases
Vector control	All disaster affected people have the knowledge and means to protect themselves from disease and nuisance vectors that are likely to represent a significant risk to health and well-being; Number of disease vectors that pose a risk to people's health and nuisance vectors that pose a risk to people's wellbeing are kept to an acceptable level; **Note**: this includes intermediate hosts like foxes, sheep, rats and others that promote spread of many diseases including viral hemorrhagic fevers, plague, etc.	Malaria, trypanosomiasis, leishmaniasis, dengue, yellow fever, typhus, chikungunya, Japanese encephalitis

Control of communicable diseases

Intervention	Minimum standards	Target diseases
Environmental control	People have an environment that is acceptable, uncontaminated by solid waste, including medical waste, and have the means to dispose their domestic waste conveniently and effectively; People have an environment in which health and other risks posed by water erosion and standing water including storm water, floodwater, domestic wastewater and wastewater from medical facilities are minimised.	Malaria, dengue, yellow fever
Epidemic preparedness and response	Measures are taken to prepare for and respond to outbreaks of infectious diseases; Outbreaks of communicable diseases are detected, investigated and controlled in a timely and effective manner.	All diseases

It is important to identify a few indicators to monitor the progress and outcomes of disease control efforts. Collecting data for selected indicators should not be difficult. To assess outcome and impact, train field workers accordingly, for example community health workers (CHWs) cannot gather information about change in health seeking behaviour after intensive information, education and communication campaigns without being trained accordingly. The following table illustrates examples of key indicators for monitoring selected disease control activities:

Table 7-6: Key indicators for monitoring disease control activities

Defining key process indicators				
Goal	**Objective**	**Input indicator**	**Output indicator**	**Outcome indicator**
Prevent excess mortality and morbidity from communicable diseases	Immunise more than 90% of all children in target group for measles.	% of volunteers and CHWs trained to promote immunisation; Frequency of vaccine shortage.	No. of mothers counselled on immunisation; No. of children that received DPT2.	% Children fully immunized Incidence of measles cases Measles mortality rate
	Reduce deaths from diarrhoea to pre-disaster levels in 3 months.	% of volunteers and CHWs trained in control of diarrhoea; Availability of Oral Rehydration Salt (ORS).	No. of mothers who know how to prepare ORT; No. of rectal swabs examined.	% of diarrhoea cases given ORT. No. of admissions due to severe diarrhoea. Percentage of deaths due to diarrhoea

Goal	Objective	Input indicator	Output indicator	Outcome indicator
	Reduce prevalence of malaria, TB and HIV to host country levels in 6 months.	% of volunteers, CHWs and Health workers trained in disease control according to national standards; % of households that received bednets; % of children < five years that slept under a bed net; No. of health facilities providing malaria, TB and HIV counselling and treatment services	% of population aware about HIV/AIDS; No. of children given anti-malarial treatment within 24 hours of onset of symptoms; Case detection rate.	% of youth that delay first sexual encounter Prevalence of malaria TB treatment success rate

To guide decision-making, it is important to disaggregate all morbidity and mortality data by age (initially for under five and above five years) as well as by gender. All data should be kept safe and only shared with those who have a stake in service delivery and programme management. (For more details on data analysis and reporting, see the Epidemiology chapter. The last section for this chapter on Monitoring, Evaluation and Operations Research describes more indicators (with examples of malaria, TB and HIV indicators).

Prevention, surveillance, preparedness and response

This section uses a systematic approach to review disease control strategies for prevention, surveillance, emergency preparedness, outbreak investigation and response, case management and control of communicable diseases.

Prevention

The most effective means for reducing a disease burden is through preventive strategies. The goal of prevention is to preserve the health of displaced persons by prevention outbreaks—predicting and lessening the impact of any possible outbreak of disease. Preventive measures focus on the initial stages of the communicable disease cycle, namely *risk and exposure factors* and *susceptibility to the disease*, as follows:

▪ *Prevent the development of infectious agents that can attack susceptible individuals* — Since this may be difficult, minimize the multiplication of infectious agent, e.g., by chlorinating water, disposing of human faeces properly, and draining wastewater;

▪ *Minimise opportunities for exposure to infections*— interrupt disease transmission by distributing bednets, treating or isolating infected persons and improving water sources and shelters;

▪ *Reduce susceptibility to infectious diseases* — improve a population's immunity by promoting better nutrition, immunisation, and others means of self-protection.

Community leaders, community volunteers and community health workers can play a critical role in planning and carrying out preventive strategies such as health education and sanitation, thereby ensuring positive behaviour change e.g. malaria bed nets are properly used. Active and well respected members of the affected community can be recruited and trained as volunteers in health education as they share the same language and culture as the target population. They can provide valuable insight on the community perspectives about specific diseases including the local terms for the cause, symptoms and treatment, and thereby make health education messages more effective. Initially the most educated or visible community members will be recruited. It is important to ensure that all sub-groups are represented including women and minority ethnic groups.

Surveillance

Surveillance is defined as the 'ongoing systematic collection, analysis, and interpretation of health data, which is essential to the planning, implementation, and evaluation of public health practice. It includes timely dissemination of data to those who need to know. The final link in the surveillance chain is the application of these data to disease prevention and control'.

Good surveillance is vital for successful control of communicable diseases. It is not enough to achieve a high coverage of bed net distribution, chlorination of water and other disease control measures. Without collecting and analysing health data such as disease incidence, health workers would not be able to detect outbreaks and alert people early or identify groups at increased risk of death from communicable diseases. Good surveillance can increase understanding about the changing disease patterns as well as guide disease control measures.

During natural disasters and complex emergencies, a surveillance system needs to be set up as soon as possible. It should focus on diseases that cause the most problems, which can be controlled by local measures. Where possible, the emergency surveillance system must be linked with the host country's surveillance system. The facility-based health information system should be augmented with a community based surveillance that uses volunteers and Community health workers or health information teams to gather essential data through home visits and other means. The figure below gives an example of functioning community based surveillance system.

Figure 7:3: Example of effective community-based surveillance

From October to December 1997, El-Nino rains caused widespread flooding in North Eastern Kenya. Over 20,000 people were displaced and required assistance from local NGOs in Garissa. People who became ill pursued health care from private practitioners.

To increase access to basic health care for the displaced communities, the Kenya Red Cross Society set up a basic health facility which included a cholera treatment centre. 100 Community Health Workers (CHW) were trained to make daily home visits, identify and refer all individuals with signs and symptoms of diarrhoea or other acute illnesses to the Red Cross health facility. In addition, the CHWs visited private health practitioners to inform them about the cholera centre and gave them referral and reporting forms in order to capture all suspected diarrhoea cases.

Within three days CHWs identified seven local persons having bleeding from the nose, mouth, urine and stool. Police reports identified thirty-two similar cases in surrounding districts. The Red Cross team subsequently assisted researchers from the ministry of health, the WHO, Centres for Disease Control and elsewhere to perform the initial investigation that revealed there was an outbreak of Rift Valley fever. Further enquiry revealed that most affected families owned livestock that became ill or had died during the floods.

Through daily visits to homes and private practitioners, CHWs proved very effective in early identification of suspected cases of haemorrhagic fever cases and cholera, referring all suspects to the Red Cross health facility for clinical management as well as in educating affected families about prevention of haemorrhagic fever and cholera.

Source: Johns Hopkins University

Surveillance forms

The host country always has a Health Information System (HIS). There are forms to be filled and reports filed regularly. One should follow the host country protocols. But many national HISs are weak and not quite reliable. Some agencies need to set up their own surveillance system. This is acceptable provided HIS conforms to the ministry of health approach and the initiative is coordinated with other agencies and the Inter-Agency Standing Committee health cluster.

Such a system needs to record *all* deaths occurring at health facilities and within and outside settlements. For morbidity information, only *newly diagnosed cases* should be tallied under the specified disease condition. Patients returning to health facilities for the same health problem within a certain period (e.g. seven days) might be recorded as 'revisit cases.' Depending on the reporting frequency, this information can be summarised on mortality and morbidity surveillance forms daily in the early phase of an operation, then weekly, or monthly. Unfortunately in real disasters, this is a problem— mortality figures often do not 'stabilise' until after two to three weeks. Patients might also visit more than one health facility for more effective treatment. See the appendix for examples of surveillance forms.

Sources of data – Surveillance data may be collected from the following sources of information:

- Morbidity and mortality reports from health facilities and community health workers. However, one can only monitor the trend for these indicators because many health facilities in developing countries keep poor records. By the end of the month, a few facilities might be tempted to fabricate some plausible figures. It is therefore critical to be very cautious with facility record reviews and interpretation of findings;

- For the post-emergency phase and long-standing relief programmes, reported deaths from central death registers, health workers, community leaders, etc.;

- Laboratory reports on isolation and identification of infectious agents;

- Reports on water supply, sanitation, vector control, shelter, food distribution, etc. from health-related services;

- Rumours or reports of disease outbreaks from community leaders, schoolteachers, volunteers, field supervisors, etc.

Standard case definitions – These are criteria that help health workers decide if a person has a particular disease or health problem. In emergencies, all operational agencies have to agree to use only one set of case definitions Case definitions may be classified according to different criteria, including the following:

- Site of clinical disease – upper or lower respiratory infections;

- Severity of disease – uncomplicated or severe malaria;

- Laboratory results – suspected or confirmed meningitis;

- History of treatment – new, relapse, treatment failure or treatment after interruption case for tuberculosis.

Standard case definitions for common health conditions are often needed for the following:

- **Registration of cases** — Standard case definitions are used to diagnose and record common health problems affecting the population. This helps to accurately monitor the disease trends and make better estimates of required resources, e.g. malaria, pneumonia. If standard case definitions are used at several locations or by different relief agencies, disease trends among different populations can be compared;

- **Notification** — Standard case definitions are used to alert national health authorities about outbreaks of *notifiable diseases,* for which regular and timely information on individual cases is necessary for the prevention and control of

diseases). These include measles, cholera, shigellosis, meningitis, hepatitis, TB, yellow fever, HIV/AIDS, and haemorrhagic fever;

▪ Appropriate treatment—Patient treatment might be prescribed according to standard case definitions, e.g. Acute Respiratory Infection, TB.

Standard Treatment Protocols defines the most effective way of treating a certain disease in a specific country. They are essentially based on the WHO standard protocols. They are not always followed by local doctors, but international aid agencies must comply with the official MOH version. In emergencies, it is often remarkably hard to get hold of such protocols; until further clarification, the WHO protocols must be used. The challenge often is to have all organisations to agree on *one set* of treatment protocols, usually discussed and established during coordination meetings.

Most case definitions in the remaining chapter are based on clinical and epidemiological information. This is because health worker skills might be limited. Laboratory confirmation and access to x-ray facilities might also not be practical particularly in the acute emergency phase.

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Epidemic thresholds – are the minimum number of cases indicating the beginning of a particular disease's outbreak. Although many risk factors might indicate a possible outbreak, it is difficult to predict when and where the outbreak will actually begin because clear case definitions and thresholds have not been defined for all communicable diseases. Specific and non-specific epidemic thresholds have been defined for the following diseases:

▪ Specific: a single reported case can imply an outbreak for the following diseases: measles, cholera, Shigella, yellow fever and viral hemorrhagic fever;

▪ Meningitis: The following table provides thresholds for predicting meningitis outbreaks among different settings:

Table 7-17: Threshold for predicting meningitis epidemics in different settings

Setting	Threshold
Area endemic for meningitis (with populations of 30,000-100,000).	Fifteen cases per 100,000 persons per week in a given area, averaged over two consecutive weeks. Increasing proportion of patients five years or older, primarily among school children and young adults.
Area where meningitis epidemics are unusual, outside the meningitis belt. (Also where population data is not known, refugee or closed communities).	Three-to four-fold increase in cases compared with a similar time period in previous years. Doubling of meningitis cases from one week to the next for a period of three weeks.
A settlement next to an area where an epidemic has been declared.	Five cases per 100,000 persons per week.

Source: WHO

▪ Non-specific threshold: there is no specific threshold level to define malaria outbreaks. An increased above the expected number of cases for a particular population at a specified time of year in a defined location may indicate an outbreak.

Case definitions and epidemic thresholds for diseases that can cause outbreaks in a particular emergency setting must be distributed to all reporting health facilities otherwise, an outbreak might become large scale simply because the surveillance team failed to recognise and respond to it in time. Building local capacity to track weekly incidence rates and compare them to the previous months or seasons might improve the

prediction of an outbreak. Another option by which to determine whether reported cases are sporadic or suggest an epidemic is to compare the disease incidence rate or **attack rate** (the proportion of those exposed to an infectious agent who become clinically ill) to the **epidemic threshold**.

Once an outbreak of a notifiable disease is detected, it must be reported immediately to all concerned. In resource limited settings, only a certain number of the initially reported suspected cases must be confirmed (by laboratory, where possible). Thereafter, all suspected cases may be considered as a true case and given the appropriate treatment and follow-up. For more specific case definitions, please see the appendix at the end of this chapter.

Emergency preparedness

Many factors can cause failure in disease prevention and lead to disease outbreaks, including:

- A lack of political commitment and funding;
- Poor surveillance systems;
- Non engagement of the community;
- Poor organisation of health care services;
- Lack of resources to fulfil the required task, especially at peripheral level;
- Too few trained staff, especially at the peripheral level;
- Insufficiently trained health care staff, or inadequately updated in their knowledge;
- Inadequate or incomplete treatment of cases;
- Over-reliance on preventive measures, e.g., water chlorination, immunisations, etc.

The following box presents all measures that must be taken to ensure adequate preparation for any disease outbreak according to the Sphere Standards.

Figure 7-4: Outbreak preparedness standards for Sphere Project

1. An outbreak investigation and control plan must be prepared.
2. Protocols for investigation and control of common outbreaks are available and distributed to relevant staff.
3. Staff trained on the principles of outbreak investigation and control, including relevant treatment protocols.
4. Reserve stocks of essential drugs, medical supplies, vaccines and basic protection material are available and can be procured rapidly.
5. Sources of vaccines for relevant outbreaks (e.g. measles, meningococcal meningitis, yellow fever) are identified for rapid procurement and use. Mechanisms for rapid procurement must be established.
6. Sites for the isolation and treatment of infectious patients are identified in advance, e.g. cholera treatment centres.
7. A laboratory is identified, whether locally, regionally, nationally or in another country, that can provide confirmation of diagnoses.

Sampling materials and transport media for the infectious agents most likely to cause a sudden outbreak are available on-site, to permit transfer of specimens to an appropriate laboratory. In addition, several rapid tests may be stored on-site.

Outbreak investigation, response and containment

Once rumours or reports from the community or other sources of a possible disease outbreak are received, initiate proper investigation and control measures as soon as possible. Form outbreak response committee needs at various levels to co-ordinate all activities. Include in the committee representatives from the affected community, health facilities, disease surveillance and control units, reference laboratory and sometimes staff from the livestock and veterinary sectors. At the regional and central levels, the Ministry of Health (MoH) is normally the dedicated coordinator in such situations supported by organisations and the Inter-Agency Standing Committee (IASC) cluster. Occasionally especially when the MoH has weak leadership capacity, another agency or the IASC health cluster can be temporarily named as the lead agency.

Objectives for investigating a possible outbreak may include the following:

- To confirm and establish the extent of the disease outbreak;
- To identify the cause(s) and ways of preventing further transmission of the disease;
- To define the best means of dealing with the outbreak;
- To determine ways of preventing future outbreaks.

The investigation needs to be undertaken in a systematic way, as described below.

Confirm the epidemic

The first report of a communicable disease outbreak should be confirmed whether or not an epidemic really exists—or dispel the rumour—and broadly describe to the affected population approximately how many cases have been identified etc. Subsequently, the investigation team can concentrate on a more elaborate report. 'False epidemics' might be the result of changes in data collection and reporting, new treatments being introduced, improved access to health facilities etc. The existing surveillance system can be revised, if n, to detect all new cases. Compare the incidence of the disease with previous seasons' to check if the number of cases exceeds the expected level.

Verify the diagnosis

Standard clinical or laboratory methods should be used to diagnose the outbreak's cause. An interim diagnosis, e.g. 'cholera or food poisoning,' might initially be used to identify the type of resources needed for the investigation.

Identify the affected persons and their characteristics

Establish a standard case definition for identifying all possible cases. Collect and record the clinical history of the index case(s) and describe the outbreak in terms of *time, place* and *person.* Reviewing the age and gender distribution, immunisation status, and other characteristics will help identify those at greatest risk. Mapping the location of each case will help identify clusters of patients and a common source of infection. These maps should be used to plan and co-ordinate control measures.

Define and investigate the population at risk

From the collected information, calculate the attack rate and graph the number of reported new cases per day or week. An 'epidemic curve' can bring to light the epidemic's onset and magnitude, its incubation period and how the disease is spreading (single source, multiple sources etc.). Two to three weeks after disasters, the risk for outbreaks of Acute Watery Diarrhoea/Cholera, Acute Respiratory Infection, malaria, dengue, tetanus are high. The prevention and preparedness should be designed accordingly.

Figure 7-5: Example of epidemic curve
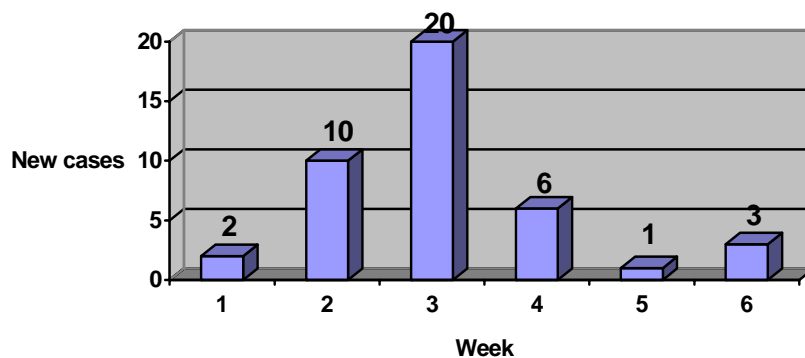
Possible nidus

Basically there are four mechanisms for disease transmission; droplets in air, faecal-oral, vector and contacts. Poverty and vulnerable groups are other elements related to population characteristics. The affected community should be mapped accordingly; identify cramped quarters, the status of water supply and sanitation system situation, food stalls/restaurants, markets and vectors.

Formulate a hypothesis about the source and spread of the epidemic

To explain why, when, and how the epidemic occurred, the situation or conditions before the outbreak must be understood. Understanding the epidemiology of communicable diseases might help to identify the cause of the outbreak (refer back to Table 7-8).

Verify the causative disease agent and the mode of spread

The probable cause of the outbreak must be identified in order to select more effective control measures. A case-control or other type of study must be carried out to test theories about the disease agent and mode of spread. Laboratory investigations must also be conducted for affected cases and contacts, where possible. Environmental sampling with laboratory analysis might be done to confirm a suspected source of infection.

Control the epidemic

- Control of communicable disease outbreaks focuses on containing the spread by protecting susceptible persons while managing the more advanced stages of the communicable disease cycle, namely the *biological evidence of infection, clinical illness* and *progression of disease* in infected persons. Possible outbreak control measures must emphasise the prevention of a disease outbreak. Once there is an outbreak, measures should include the following:
  - **Primary prevention** — against the development of biological and clinical signs of disease by immunising susceptible people, appropriate site planning, provision of safe and adequate water, practising good sanitation, protecting food stores, markets, restaurants, implementing vector control etc.;
  - **Secondary prevention** — preventing mild illness from becoming more serious by diagnosing early and treating with antibiotics (where appropriate) and supportive care. against mild illnesses becoming more serious by diagnosing early and treating with antibiotics (where appropriate) and supportive care;
  - **Tertiary prevention** — against disease complications by referring or treating individuals with cerebral malaria, children with severe TB and malnutrition, etc.

Case management

Effective case management requires health services to be accessible to all high risk groups (which could be the entire population). Most people affected by an outbreak do not seek health care from available health facilities—it is a well-known fact that most children die before they reach the clinic. Much of the 'case management' takes place in the community. This makes it absolutely vital to engage communities and its volunteers to raise awareness and ensure that serious cases are sent to the clinic. In areas where laboratory facilities are lacking, diagnostic sticks, clinical and symptom-based diagnosis for communicable diseases remain the standard for case management. Simple diagnostic algorithms and treatment protocols can be developed or adapted for the local situation by the local health authorities and other partners involved with health care delivery. The standard treatment protocols of the host country as well as of refugees' countries of origin must be considered.

In addition to being simple and straightforward, treatment regimens for communicable diseases must be based on sound evidence that is applicable to most settings. The following criteria can be considered: availability, efficacy, affordability, tolerability and the benefit to the majority of people and options for second line treatment. This approach will help simplify the:

- Procurement and drug logistics management;
- Treatment protocols with options for clinicians;
- Stand by treatments, single dose treatments are of particular importance in emergencies;
- Distribution at peripheral level/ in communities of certain drugs (such as ORS);
- Sequencing of treatment; and
- Preservation of low cost drug regimens at a population level and minimizing the risk of drug resistance.

Single or Fixed Dose Combinations (FDCs) are preferable for the standardised regimen: they are easier to administer and monitor because of their reducing of the pill burden and thereby increase adherence to treatment. However, FDCs with appropriate dosages for children are less available. It is likely that more FDCs will be available in the future.

As well as training and mentoring health care providers about standard treatment guidelines, distribute copies of treatment protocols to all treatment facilities. In post-emergency settings, traditional healers and private health practitioners at local shops and pharmacies might prescribe inappropriate treatment for communicable diseases or provide inappropriate patient education. Training about these protocols must be strict. Because traditional healers and private health practitioners cannot be stopped from practicing, it is, therefore, better to improve their skills. The amount of drugs issued via the commercial sector must also be monitored to ensure they are affordable and dispensed with appropriate patient education on use.

Write a report

Regularly document and disseminate progress reports to all concerned about the outbreak investigation and response. In early stages, reports must be daily. Once the operation and situation has stabilised, less frequent reporting can be agreed upon also making them more comprehensive and covering more diseases. Today, filing a report on time is not a problem. It is easy to e-mail, but in many disasters, the Internet can be unavailable. Therefore, one must be able to send messages by SMS or satellite telephone ensuring that the information is reaching its appropriate destination. The affected community must be aware of the nature of the outbreak and how they can protect themselves or assist affected people. Local health authorities need the information to plan appropriate control measures and ensure they are better prepared for future outbreaks. Reports in the media and medical journals might increase external support and improve responses to future outbreaks. In addition to the threat of all possible disease epidemics and local capacity to

manage the current situation, reports on disease outbreaks need to capture the following indicators:

- Morbidity: incidence rate, age and sex-specific incidence rates;
- Mortality: crude mortality rate, under-five mortality rate, case fatality rate.

If the Case Fatality Rate (CFR) for a specific disease exceeds what is expected, an immediate evaluation of current disease control efforts should be undertaken. This will encourage corrective measures to be identified that could reduce the CFR to acceptable levels. In general, disease control planners should aim for a CFR as low as possible although for some outbreaks it might exceed 20%. (See the disaster epidemiology chapter for more details about investigating and reporting outbreaks).

Handling the remains of the dead

Although dead bodies do not represent a major health hazard if buried or burned immediately, burying the dead must be planned when any epidemic results in high case fatality. The table below defines basic principles for managing dead bodies after communicable disease epidemics.

Figure 7-6: Principles for management of dead bodies[23]

1. Every effort should be made to identify the bodies.
2. Burial is preferable to cremation in mass casualty incidents.
3. Mass burial should be avoided if possible.
4. Families should have the opportunity to conduct culturally appropriate funerals and burials.
5. Where existing graveyards or crematoria are inadequate, provide other locations or facilities.
6. For workers routinely handling dead bodies, promote the following:
   - Universal precautions for blood and body fluids;
   - Use of correct disposal of gloves;
   - Use of body bags if available;
   - washing with soap after handling bodies and before eating;
   - Disinfection of vehicles and equipment;
   - Bodies do not need disinfection before washing (unless cases of cholera, hemorrhagic fever);
   - Bottom of any grave is > 1.5 m above the water table and 0.7 m unsaturated zone.

Scaling up and scaling down disease control efforts

When designing a disease control programme it is important to plan for possible expansion and an exit strategy as discussed below.

Expansion

Possible reasons for scaling up a disease control programme include population influx and movement, stabilization of the emergency situation, and evidence of increased disease burden, disruption of neighbouring health services, more funding support and improved security. Expansion should be gradual to allow for appropriate planning with involvement of the beneficiary population, effective training of staff, procurement of additional supplies and positioning of higher level supervisors to assist as trainers. Training should include volunteers and CHWs in the community, the health staff at

peripheral health facilities that may represent the frontline workers for case-finding and treatment. Laboratory staff also needs training before expanding services.

Contingency planning

In any emergency operation, a contingency plan must be designed for a sudden change of the situation. New population movements, security, new flooding and serious earthquake aftershocks may dramatically change the scene. In most operations, this element is sorely neglected and when the agencies are often taken by surprise.

Phasing down or out

Every emergency programme needs to include a contingency plan for probable phase down or closure. Possible reasons include unstable situations in the area within the camp, forced relocation of the refugees, decreased donor support or declining disease burden. While many disease control programmes may be terminated quite rapidly (e.g. within 1 month), scaling down of TB control needs to be stretched over a period of not less than 3 months. Although no new cases would be enrolled, a gradual phase down would allow for existing TB patients to either complete their regimens or to establish appropriate linkages and follow-up at their next destination.

Community participation in communicable disease control

Communicable disease control in emergency and post-emergency phases is delivered effectively when it is participatory. Experience and many studies document the benefits of using a community participatory approach to relief in emergency settings and to development in post-emergency phases. The benefits are many. Participatory relief programmes can deliver aid in a timely manner, ensure that resources reach the most vulnerable and poorest individuals, enhance rather than weaken existing health structures and empower communities to take more control of their lives.

Yet, while emergency health agencies that implement communicable disease control widely proclaim their commitment to community participation, genuine examples of participation by beneficiaries are rare.[25] Although Red Cross and Red Crescent National Societies and few other agencies often work at the community level, many host authorities and affected populations complain about the relative absence of additional community participatory programmes. Some suggest that international aid agencies are inherently inflexible caused by rigid funding structures and accountability to their donors.[11] Others argue that aid workers commonly hold superior attitudes and view the poor and affected populations as incapable of making informed decisions about the design and delivery of aid including communicable disease control programmes. Others still suggest that aid agency staff simply do not remain long enough in one area to listen and respond sensitively to the concerns of beneficiaries.[10]

Before outlining how communities can participate in communicable disease control programmes in emergencies, it is important to describe what is meant by community participation. Community participation has come to be understood by many relief and development practitioners as follows:

Community participation is a process in which "community people would become involved in both delivery of and decisions about health and health services in order to provide the type of care most appropriate to their own defined needs and circumstances"[30].

This definition is rather vague to allow flexibility in community involvement for various political, economic and cultural contexts. When implementing communicable disease control programmes in emergency and post-emergency phases, community participation might only be present as a few volunteer or community health workers support

programmes that are used to deliver directly observed therapy for active TB. However, developing a community health worker programme does not by itself lead to community participation in emergencies. Instead, community participation exists only when community members are actively involved in identifying their own needs and involved in decisions about how to improve their conditions.

Potential areas for community involvement

Multipurpose volunteers are trained worldwide to do both community awareness and mobilisation when needed as well as detecting disease and ailments. The Red Cross and Red Crescent National Societies do this all the time and well over 100 million volunteers are working for the most vulnerable people. Other organisations have the same principle. A particular programme on water and sanitation, called Participatory Hygiene and Sanitation Transformation or PHAST, embraces these principles in full. In emergency settings, these volunteers are invaluable and often crucial for delivering effective relief and epidemic control programmes.

As for communicable disease control programme, these volunteers and community members can participate at several levels of activity. By knowing the disease(s) they should look for and make the community aware of, they constitute a formidable early warning system.

Furthermore, the approach is *information sharing* and *consultation*, *decision-making* and *initiating action*.[27] Participatory methods for information sharing and consultation include secondary data reviews, direct observation, semi-structured interviews, group interviews, mapping, diagrams, patient narratives, stories, case studies and surveys.[8] In the case of communicable disease control, life narratives and semi-structured interviews can be used to gather information about the social and economic barriers to TB treatment in displaced settlements.

Table 7-7: Steps to promote community participation in communicable disease prevention and control

Level of community participation	Methods	Examples
Information sharing and consultation	Train community volunteers and Community Health Workers to recognise diseases, do prevention work and report cases; Secondary data reviews, semi-structured and group interviews, patient narratives, surveys.	Diarrhoeal disease prevention oral rehydration salts (ORS); Malaria, prevention, bed nets; Collect information on social and economic barriers to TB treatment through life narratives and semi-structured interviews.
Decision-making	Hold relief co-ordination meetings in the community and invite community representatives.	Invite community members to participate in meetings of immunization programme managers.
Initiative action	Make the community aware of resources available for potential community-driven activity.	Training and salaries for community health workers willing to provide HIV/TB treatment support (see Fig 7-7).

For prevention, organisations should encourage the communities to identify and map the diseases occurring there and also involve them in preventing such disease and outbreaks and in report them.

At the **decision-making level**, agency staff should ask: 'How can people participate so they are able to influence the decisions taken at every stage of the communicable disease control project?' Participatory methods at the decision-making level include inviting community representatives to relief co-ordination meetings, which usually take place at distances far from the site of the emergency. As for communicable disease control, community representatives can be invited to participate in meetings of immunisation programme managers.

Figure 7-7: Participatory methods for HIV treatment in an emergency

Surviving political crisis in Haiti: Participatory methods for HIV treatment in an emergency

In the late 1990s, Partners in Health established, with its sister community organization, Zanmi Lasante (ZL), a community-based treatment model for HIV and TB treatment on the central plateaus of rural Haiti. The ZL model, called the HIV Equity Initiative, is a community-based structure that employs nearly 1,000 community health workers, who provide directly observed tuberculosis and antiretroviral treatment, social and economic support for over 2500 HIV and TB-infected patients near their homes in central Haiti. Details of the programme are described elsewhere[28, 13].

In February 2004, this community-based model of treatment was tested when a coup d'état removed then-President of Haiti, Jean-Bertrand Aristide. In the months leading up to the coup, much of the nation's fragile public health system was further disrupted. Due to insecurity, many private and public clinics remain closed throughout February, March and April 2004. However, all six of ZL's clinics remained open during the unrest and only the six expatriate employees were forced to flee. All the Haitian staff, including the community health workers, remained, and almost none of the program's 2500 HIV and TB patients missed a single dose of their medications. This, of course, is important to the health of individuals suffering from acute and chronic infectious diseases. The ZL model demonstrates that "community participation is essential in the struggle to provide equitable health care to the world's poor," particularly in areas experiencing emergencies[19].

Afterwards, participatory methods can be used at the **level of initiating action**. A health relief agency helps empower communities by making them aware of the resources that the agency can offer. This information can spark social mobilisation in various ways in order to access resources. Effective measures have been taken in emergency and post-emergency contexts to help communities initiate action in communicable disease control. For instance, the NGO, Partners in Health, offered communities in rural Haiti the opportunity to receive home-based delivery of anti-retroviral treatment of HIV. With the help of Partners in Health which included salaries for community health workers, these communities established a decentralised system of HIV treatment delivery after the directly observed therapy model for TB treatment. In 2004, this system withstood a massive political crisis in Haiti (See Figure 7-7).

Finally, community involvement can enhance case detection, assisting to identify defaulters and managing the process. Implementing agencies can engage, community leaders, volunteers, traditional healers, traditional birth attendants, and private practitioners in prompt case detection and appropriate treatment. Community health workers and volunteers may be trained to identify cases through routine home visits while traditional healers and private practitioners may be invited for joint ward rounds in primary health care facilities so that patients could benefit from both medical and herbal treatment. Periodic clinical meetings may also be organised to update the non-formal health providers on new treatment protocols and improved referral mechanisms to assure better patient management from the traditional healers and private practitioners to public health facilities. This will improve treatment outcomes and minimise resistance to new therapies.

Major diseases in emergency and non-emergency settings

Disease threats in natural disasters and conflict situations

Although disease epidemics can occur in both emergency and non-emergency situations, outbreaks are more common among conflict-affected populations where they can cause up to two-thirds of all deaths. This is because malnutrition, safe water scarcity, blunt trauma and disrupted health services are more prevalent in conflict situations particularly long-term conflicts. To improve the health of populations affected by natural disasters and conflict situations, humanitarian actors must address the underlying risk factors immediately after they have initiated disease control measures. If two or more epidemics have erupted simultaneously within a community, humanitarian actors should give priority to the disease with the highest burden of illness and death.

The following table defines the diseases that are likely to cause outbreaks with corresponding general preventive measures. Diseases appearing in bold font in the table are likely to cause outbreaks in all situations and will be the main focus for the remainder of this chapter.

Table 7-8: Diseases likely to occur during emergency situations

Classification	Diseases possible	Preventive measures
Air-borne diseases	Acute Respiratory Infections Measles Meningitis Pertussis (whooping cough) Tuberculosis Influenza	Site planning Adequate nutrition
Water-related diseases	Amoebae Cholera Diarrhoea Dysentery Poliomyelitis Hepatitis Parasites: round/hook worm Typhoid	Site planning Safe water Good sanitation Personal hygiene Case management
Vector-borne diseases	Malaria Relapsing fever Sleeping sickness Dengue hemorrhagic fever Typhus Yellow fever Chikungunya Dengue Leptospirosis Leishmaniasis Marbug Lassa Fever Ebola	Vector control Personal protection Personal hygiene Case management

Classification	Diseases possible	Preventive measures
Sexually Transmitted Infections (STIs)	Syphilis Chancroid Gonorrhoea Chlamydia HIV	Health education Security Case management
Other diseases	Scabies Worms Tetanus	Hygiene Hygiene

Historical evidence shows that the risk of epidemics after a natural disaster is quite low unless surrounding conditions favour the rapid spread of communicable diseases. There is a close association between epidemics and population displacement since outbreaks rarely occur where natural disasters have not resulted in substantial displacement of the local population. The risk of disease outbreaks after floods and tsunamis is greater than for earthquakes, volcanoes, hurricanes and other high-wind natural disasters. Risk of disease spread increases when populations live in a crowded environment, lack access to safe water, latrines and health services, have poor nutritional status or low immunity to vaccine-preventable diseases.

The following table lists some epidemics that have been reported in countries affected by major natural disasters and factors that might have contributed to the outbreaks.

Table 7-9: Risk factors and diseases likely to occur in natural disasters and displaced population settings

Natural disaster	Transmission	Disease	Risk factors
Floods	Water-related	Cholera Typhoid Hepatitis A and E	Contaminated water Population displacement Overcrowding
	Vector borne	Leptospirosis	Proliferation of rodents
		Malaria Dengue	Seasonality Changed habitat Disrupted environmental control Changed human behaviour
Tsunamis	Airborne	Measles ARI	Overcrowding Low baseline immunization coverage Disruption of electricity
	Water-related	Cholera Typhoid Hepatitis E	Contaminated water Population displacement Overcrowding
	Other	Tetanus	Injuries
High wind disasters	Airborne	ARI	Crowding Indoor cooking Malnutrition Limited access to health services
	Vector borne	Malaria	Changed habitat Disrupted environmental control Changed human behaviour
	Other	Tetanus	Injuries

Natural disaster	Transmission	Disease	Risk factors
Earthquakes	Airborne	Measles Coccidiomycosis	Low baseline immunization coverage Airborne dust from landslides
	Water-related	Hepatitis E	Water scarcity
	Vector borne	Malaria	Changed habitat
	Other	Tetanus	Injuries Low baseline immunization coverage
Volcanic eruptions	Airborne	Measles	Low baseline immunization coverage
	Other	Tetanus	Injuries Low baseline immunization coverage
Drought	Water-related	Dysentery	Malnutrition Water scarcity

Note: Disease outbreaks after floods, tsunamis and hurricanes are better documented than diseases after other natural disasters.

Disease control efforts after natural disasters must include mass casualty management in response to the initial traumatic impact as well as ongoing surveillance, the supply of safe water and sanitation, therapeutic and other preventive interventions for long-term survivors.

Managing common epidemic diseases

Acute Respiratory Infections (ARIs)

ARIs are the leading causes of illness in developing countries particularly among children less than five years. About 20% of all deaths in children under 5 years are due to Acute Lower Respiratory Infections (ALRIs - pneumonia, bronchiolitis and bronchitis); 90% of these deaths are due to pneumonia. Early recognition and prompt treatment of pneumonia is life saving.[3.35] (WHO sources). Most of them die before they reach peripheral health care services.

Agent

Although many disease pathogens can cause ARIs, bacteria and viruses together account for 75% of all deaths from pneumonia specific disease pathogens for ARIs include:

- **Bacteria** — Streptococcus pneumoniae, Haemophilus influenza.
- **Viruses** — measles, respiratory syncitial virus, para-influenza, adenovirus and rhinovirus both of which can invade any part of the respiratory tract.[2, 21] After a viral infection, people are susceptible to a secondary infection, often caused by bacteria.

The following factors might increase the likelihood of transmission and poor outcome from ARIs:

- **Environment** — insufficient shelter, indoor air pollution (smoke from cooking fuel and cigarettes), overcrowding, and reduced access to health care.
- **Host** — age (less than 2 years and above sixty-five years of age), low birth weight, lack of breast-feeding, malnutrition, vitamin A deficiency, incomplete immunisation, and lack of maternal education.

ARI can affect one or more parts of the respiratory system as follows:

- **Upper respiratory tract** — nose, pharynx, epiglottis or middle ear.
- **Lower respiratory tract** — larynx, trachea, bronchi, lungs.

As a result, people with ARIs might show a variety of clinical features such as a runny nose, sore throat, cough, difficult breathing or ear problems. Other diseases such as malaria often mimic the symptoms and clinical features of ARIs. However, a few children with coughs might develop acute lower respiratory infections particularly pneumonia (an acute infection of the lungs). Severe pneumonia can lead to death either from lack of oxygen or infection of the bloodstream (called sepsis or septicaemia). The following table summarises the classification of ARIs based on the main symptoms.[52]

Table 7-10: Clinical presentation of ARIs

Main symptoms	Classification of ARI
Cough, difficult or rapid breathing	▪ No pneumonia ▪ Pneumonia ▪ Severe pneumonia ▪ Very severe disease (severe complications of measles, whooping cough, diphtheria)
Ear pain or discharge	▪ No ear infection ▪ Mastoiditis ▪ Acute ear infection ▪ Chronic ear infection
Sore throat	▪ Streptococcal sore throat ▪ Throat abscess

Source: WHO – Integrated Management of Childhood Illnesses (IMCI)

The remainder of this chapter will focus on Acute Respiratory Infection that cause high morbidity and death, namely those characterised by a cough or difficult breathing.

Most episodes of ARIs in children are self-limiting and not serious. However, some children can develop pneumonia which might become severe and cause death. This is common where caregivers (usually mothers) and primary health care workers fail to recognise the danger signs of pneumonia (which include the inability to drink or breastfeed, convulsions, lethargy or loss of consciousness). Early and correctly identifying and treating the few sick children with pneumonia among many others with milder respiratory infections will greatly reduce deaths in children.

Case management

Because most refugee settings lack X-rays, laboratories or doctors, simple clinical criteria are needed to assess the child, classify the illness and determine the appropriate treatment which includes referral to hospital, antibiotic treatment and care at home. Again, it should be emphasised that many sick children never reach clinics where they can be appropriately treated. The following table summarises the management of ARIs based on Integrated Management of Childhood Illnesses (IMCI) classification of ARIs.[48]

Table 7-11: Treatment of cough or difficult breathing

Disease	Care of children aged 2 months to 5 years
Severe pneumonia or very severe disease	▪ Give first dose of antibiotic. ▪ Refer *urgently* to hospital.
Pneumonia	▪ Give an appropriate antibiotic for five days. ▪ Soothe the throat and relieve the cough with a safe remedy. ▪ Advise mother when to return immediately. ▪ Follow-up in two days.
No pneumonia: cough or cold	▪ If coughing more than thirty days, refer for assessment. ▪ Soothe the throat and relieve the cough with a safe remedy. ▪ Advise mother when to return immediately. ▪ Follow-up in five days if not improving.

Source: WHO – IMCI

Note: Health workers must assess, classify and treat young infants aged less than two months differently from older children. This is because young infants may have different Acute Respiratory Infections (ARIs) symptoms and they can die very quickly. All young infants with pneumonia must be referred immediately to a hospital.

Control of ARIs

The control of ARIs is based on early detection, early referral and standard case management. Volunteers and Community Health Workers (CHWs) in the community can play a major role in controlling the disease. This also requires staff training, adequate drug supplies and ARIs management charts for Primary Health Clinics (PHC) workers (e.g. IMCI). Access to health care (first-level health facilities and first referral hospitals) should also be assured. In addition to case management, ARIs control also involves health education and promotion. This will ensure that caregivers give appropriate home care, recognise danger signs and know when to seek help. Promoting breast-feeding, immunisation (for measles, whooping cough and diphtheria), vitamin A supplementation and reducing domestic pollution will lead to fewer episodes of ARIs in children.

Diarrhoeal diseases

World Fit for Children target: Reduce by one half deaths due to diarrhoea among children under the age of five. Diarrhoeal diseases account for nearly 2 million deaths a year among children under five, making them the second most common cause of child death worldwide. (UNICEF source).

Diarrhoeal diseases cause major health problems among disaster-affected populations. Among displaced populations, diarrhoeal diseases account for over 50% of the deaths during the acute emergency phase. Although many organisms cause diarrhoeal diseases, only *Vibrio cholera* and *Shigella dysenteriae* have the potential for causing major outbreaks in emergency situations. In 1994, 85% of the 50,000 deaths that were recorded in the first month after the influx of 800,000 Rwandan refugees into North Kivu in Democratic Republic of the Congo were caused by cholera and Shigella dysentery. Scarcity of water was the most important risk factor—an estimated 200mL per person per day was provided to the displaced people in the first week of the crisis. Consequently, between March 2001 and October 2002, 55 cholera epidemics were reported in Democratic Republic of the Congo with 2129 deaths among 38 000 cases from 51 health zones in 7 provinces. The case fatality rate was therefore excessive: 5·6% (range: 0–33·7%) (WHO Alert and Response, unpublished data).

The following table summarises the causative agents for common diarrhoeal diseases:

Table 7-24: Common causes of diarrhoeal diseases

Type	Classification	Causative agent
Acute Watery Diarrhoea (AWD)	Bacteria	Enterotoxic E. coli, Clostridium perfringens, Staphylococcus, Campylobacter jejuni, Salmonella (non-typhoid).
	Viruses	Rotavirus, Enterovirus, Adenovirus..
	Vibrio	Vibrio Cholera
	Fungi	Candida albicans*.
	Parasites	Giardia lamblia.
Bloody Diarrhoea	Bacteria	Shigella dysenteriae, Salmonella typhi, Enteroinvasive E. coli, Yersinia enterolitica.
	Parasites	Entamoeba histolytica.

* Usually affect people with lowered immunity.

Note: Cholera and dysentery are not the most common causes of diarrhoea except during epidemics. Most cases with acute watery diarrhoea (AWD) do not respond to antibiotics because they are mainly caused by viruses.

The following factors are associated with increased spread and death from diarrhoeal diseases:

- **Environment**—overcrowding, inadequate water quantity and quality, insufficient sanitation facilities and scarcity of soap make it easier for diarrhoea pathogens to be transmitted. Faecal contamination of surface water is a common cause of diarrhoeal disease outbreaks. In a typical camp situation with multiple risk factors, a cholera outbreak can last between three and twelve weeks; in non-camp settings, deaths among Congolese refugee children in Tanzania in 1999 and Democratic Republic of Congo, the median duration was sixteen weeks (range: 3 to 59 weeks). Angola has experienced a prolonged cholera outbreak which lasted for years while the outbreak in South Sudan and Ethiopia could have lasted for up to two years. In more stable settings, increased frequency of diarrhoeal disease was associated with increased crude and under-five mortality rates in an investigation of 51 post-emergency camps in seven countries from 1998 to 2000;

- **Population**—greater risk of death among the very young age (below two years of age). Risk can be increased by poor hygiene practices (personal, domestic, and environmental) and poor nutritional status. Low immunity prior to the infection can also increase the likelihood of transmission and prolong suffering among displaced persons.

The natural history of diarrhoea is that most episodes will stop without treatment. As a result, the risk of death from diarrhoeal diseases is frequently underestimated. However, diarrhoea can lead to serious complications, such as:

Access to clean water is more of a challenge in Africa than in any other region of the world. The International Federation is scaling up its water and sanitation activities in many areas.
Photo: Daniel Cima/ American Red Cross

Table 7-25: Serious complications of diarrhoea

Complication	Description
Dehydration and death	The biggest threat from diarrhoea is not loose stool, but dehydration from excessive loss of body fluids and salts. Some patients lose up to 5-10% of their body weight. Dehydration may develop suddenly and death can occur soon thereafter if body fluids are not replaced immediately, particularly among young children.
Malnutrition	While the risk of diarrhoeal diseases is higher in a malnourished child, diarrhoea may lead to under-nutrition through loss of appetite, decreased absorption of nutrients, or withholding of normal feeding (due to cultural beliefs). Children suffering frequent episodes of diarrhoea may become stunted.
Fever	Children with dehydration or diarrhoeal disease may develop fever. However, very high fever persisting after a patient has been rehydrated indicates the presence of another infection (e.g. otitis media, pneumonia, measles, malaria, meningitis, typhoid fever).
Seizures	Seizures may result from fever, dehydration, low blood glucose levels, or sodium overload.
Persistent diarrhoea	Children who have many episodes of diarrhoea are likely to develop persistent diarrhoea. It may be due to multiple infections of the same pathogens that cause acute diarrhoea. Many children in developing countries die from persistent diarrhoea particularly those who are malnourished.[25]

Cholera

Cholera is an acute bacterial infection caused by *Vibrio cholerae*. It accounts for more than 150,000 deaths each year in developing countries and causes high morbidity and mortality in populations affected by natural disasters and conflict situations. Globally, the incidence of cholera has decreased, but in Africa, has increased considerably. Several outbreaks of cholera have occurred among displaced populations since 1990 in Malawi, Sudan, Nepal, Somalia, Burundi and Democratic Republic of the Congo.[11] There are more than sixty serogroups of *V. cholerae*. For many years, most outbreaks world-wide were caused by *V. cholerae* serogroup O1, El Tor biotype. Since 1992, *V. cholerae* O139 has been identified as another causative agent for cholera outbreaks in South Asia.

Note: The El Tor biotype causes a higher number of asymptomatic carriers and risk of transmission is higher because it can survive in fresh water for long periods of time.

Cholera has a very short incubation period, ranging from less than one day to five days. Although infected persons excrete the bacteria in their faeces for seven to fourteen days, most do not become ill. However, a few cases develop painless, watery diarrhoea (due to a bacteria enterotoxin) that can quickly lead to severe dehydration. Vomitus, stools, soiled clothes and bed linen are highly infectious and need disinfection. Cholera attack rates in refugee settings may reach 5% (one in every 20 persons). Case-fatality rates for cholera may be as high as 50% if a community or health system is not prepared to deal with the outbreak. It should be 1% or lower.

Laboratory confirmation is often delayed. This might be due to limited access to a competent laboratory. Often, however, there is a governmental unwillingness to declare a cholera outbreak since it can harm tourism and trade.

Note: Any Air Way Bill (AWD) outbreak with adult deaths raises the suspicion of cholera and action should be taken accordingly.

Bacillary dysentery (Shigellosis)

Dysentery is commonly defined as acute bloody diarrhoea. Although several organisms can cause dysentery, Shigella is the only cause of large-scale epidemics of dysentery throughout the world. Shigellosis, or bacillary dysentery, has caused high rates of illness and death in east and central Africa since 1992. In recent years, these outbreaks have become quite frequent during periods of civil unrest. Case-fatality rates for this illness can exceed 10%.

Note: Bloody diarrhoea due to amoebiasis (infection with Entamoeba histolytica) is neither common nor severe and does not cause epidemics.

S. dysenteriae (Sd) type 1 (Sd 1) is an unusually virulent organism. A very low dose of Sd 1 (less than 100 organisms) can cause severe clinical illness. The organism can also survive in the environment for a fairly long time. Individuals infected with Sd 1 excrete large numbers of bacteria in stool. The risk of Sd 1 outbreaks among displaced populations is high and up to one-third of the population might be infected. Attack rates in non-emergency situations are usually about 5%. The case-fatality rate can reach 10% in areas without proper treatment. The highest case fatality is observed among children, the elderly and the malnourished. Unfortunately, most strains of Sd 1 in Africa have developed resistance to commonly used antibiotics during the last few years. In some areas, only ciprofloxacine, a very costly antibiotic, is effective against Sd 1.

The following table summarises the epidemiology of cholera and bacillary dysentery.

Table 7-26: Summary of epidemiology of cholera and bacillary dysentery

	Cholera	**Bacillary dysentery**
Causative agent	Vibrio cholerae O1 or V. cholerae O139	Shigella dysenteriae type 1.
Geographical distribution	Asia, Africa, Latin America	Worldwide.
Transmission	- Ingesting faecal-contaminated water (main route). - Consuming contaminated food, seafood, fruits, and vegetables. - Person-to-person contact (rare).	- Person-to-person contact. - Direct contact with infected faecal material. - Ingestion of contaminated food and water.
Risk factors	- Inadequate and unsafe water supply and food. - Inadequate heating/reheating of food (even grain-based foods). - Spreads at funeral ceremonies and feasts. - Low acid levels in stomach.	- Overcrowding. - Poor sanitation and sub-standard hygiene. - Unsafe water supplies.
Clinical features	- Incubation less than 1 day to 5 days. - Asymptomatic: most infected persons do not become ill. - Mild or moderate diarrhoea in 90% of cases. - Profuse watery diarrhoea (rice water stools) and dehydration may develop in less than 10% cases. - Vomiting (common.	- Acute non-bloody diarrhoea - Bloody diarrhoea may develop in 50% of cases with cramps, rectal pain, fever, mild-moderate dehydration. - Complications: 10% of cases may develop sepsis, seizures, renal failure, and haemolytic uraemic syndrome, toxic megacolon.

Control of communicable diseases

	Cholera	Bacillary dysentery
Case definitions	**Suspected cholera** *In areas where cholera unknown to be present:* ▪ A patient over the age of five years old develops severe dehydration or dies following acute watery diarrhoea. *In an area where cholera is endemic:* ▪ A patient over five years develops acute watery diarrhoea. **Confirmed cholera** Isolation of V. cholera O1 or O139 from stool or vomit of suspected case.	**Suspected shigella** When there is an unusual increase in the weekly number of cases or number of deaths from bloody diarrhoea. **Confirmed shigella** Confirmed by evidence of acute onset of bloody diarrhoea with visible blood in stool. In some situations, the presence of blood is verified by a health worker.

Case management of diarrhoeal diseases

The goal of case management for diarrhoeal diseases is preventing death from dehydration and circulatory collapse. Early diagnosis of patients with a diarrhoeal illness should be followed by prompt treatment to prevent death from dehydration. The main treatment for acute diarrhoea is rehydration. Stool losses should be replaced with appropriate fluids, feeding should be continued and unnecessary medicines avoided. The same principles can be applied to the treatment of persistent diarrhoea. Health care professionals, volunteers and community health workers (CHWs) must be trained to classify the level of dehydration among diarrhoea patients and manage as described in the table below.

Table 7-27: Classification and management of dehydration among diarrhoea patients

	Clinical features	Recommended rehydration therapy
Diarrhoea +/- mild dehydration	▪ < 4 fluid stools/day. ▪ Alert. ▪ Not thirsty and drinks normally. ▪ Little or no vomiting. ▪ General condition normal. ▪ No signs of dehydration. ▪ Skin pinch goes back quickly.	**Increase fluid intake at home** Teach caregivers, especially mothers of children with diarrhoea, to administer ORT 50 ml/kg body weight after each diarrhoea episode. Advise caregivers to return if watery stools increase, if child is eating or drinking poorly, has marked thirst, is vomiting, or develops other signs.*
Moderate dehydration	▪ 4-10 liquid stools/day. ▪ Thirsty and drinks eagerly. ▪ Dry conjunctiva, lips and inside of mouth. ▪ Urine flow reduced and concentrated. ▪ Skin loses elasticity and pinch reacts slowly. ▪ Pulse rapid. ▪ Respiration deep.	**Oral rehydration therapy at an ORT unit or diarrhoea corner** ▪ 100ml/kg body weight in 4 hours. ▪ Reassess patient every 4 hours to ensure sufficient ORS intake.

	Clinical features	Recommended rehydration therapy
Severe dehydration	▪ 10 liquid stools/day. ▪ Frequently lethargic. ▪ Drinks poorly or unable to drink. ▪ Fluid loss > 8% of body weight. ▪ No urine flow in previous 8-12 hours. ▪ Eyes deeply sunken. ▪ Skin pinch reacts very slowly. ▪ Pulse may be rapid or barely detectable. ▪ Respiration deep and rapid.	**Rapid intravenous rehydration at health facility** ▪ Ringer's lactate (Hartmann's solution) 150ml/kg body weight in 4-6 hours. ▪ Oral rehydration therapy to be instituted as soon as a person can take ORS.

The following table defines other treatment approaches for different diarrhoeal diseases:

Table 7-28: Summary of treatment for diarrhoeal diseases

	Other diarrhoeal diseases	Cholera	Dysentery
ORS	Effective for diarrhoea due to rotavirus, E. Coli (enterotoxigenic).	Mainstay of treatment for 80-90% of cases.	Can be useful.
IVF	Required for cases with severe dehydration.	Required for 1% cases who develop severe dehydration.	Not often required.
Antibiotics	Not useful at all.	Appropriate for moderate or severe dehydration. Selective drug prophylaxis for close contacts.	Mainstay of treatment 5-day course
Specific drugs	Metronidazole (flagyl) for amoebiasis and giardiasis.	Tetracycline, cotrimoxazole, erythromycin, doxycycline, chloramphenicol, furazolidone.	▪ Ampicillin and cotrimoxazole not effective in recent ourtbreaks of SD 1vi. ▪ Increasing resistance to nalidixic acid. ▪ Ciprofloxacin effective but costly.
Dietary therapy	Increase fluids and food intake.		Increase fluids and food intake.

Measles

▪ Measles remains a major childhood killer, despite the availability of a safe and effective vaccine. In 2006, an estimated 242.000 people died of measles; about 217.000 of these deaths were among children under five years old who are the most vulnerable to measles. In 2006, about 74% of all measles deaths occurred in the WHO region of South-East Asia and only 15% in Africa (http://www.redcross.org/static/file_cont7323_lang0_3016.pdf).

Nearly 600 children under five die from measles each day. Despite the efforts of the global Expanded Programme of Immunisation (EPI), measles is still endemic in many developing countries, especially where conflict prevents routine

immunisation.6 Considerable progress has been made in reducing the measles mortality by 68% worldwide (91% in sub-Saharan Africa), through the founding of the Measles Initiative in 2001, a partnership of the American Red Cross, CDC, WHO, UNICEF and United Nations Foundation. Reference the Measles mortality reduction strategy (attached in fact sheet).
http://www.measlesinitiative.org/index3.asp

- Measles is an acute infection of the virus, *Morbillivirus* of the family *Paramyxoviridae.* The disease is spread through close respiratory contact with contagious air droplets. Infected persons can transmit the disease to susceptible hosts even before the appearance of the measles rash. Life-long immunity is acquired after measles infection. The case fatality rate in developing countries is generally in the range of 1 to 5%, but may be as high as 25% in populations with high levels of malnutrition and poor access to health care. People who recover from measles are immune for the rest of their lives[2, 32]
http://www.who.int/mediacentre/factsheets/fs286/en/).

- Measles can be particularly deadly in countries experiencing or recovering from war, civil strife or a natural disaster. Infection rates soar because damage to infrastructure and health services interrupts routine immunization and overcrowding in camps for refugees and internally displaced people greatly increases the risk of infection Measles outbreaks commonly occur in refugee settings, especially during the acute emergency phase. In general, even with relatively high immunisation coverage (<90%) a number of cases and epidemics occur after a massive population movement and disasters. Major outbreaks have occurred after disasters, notably after the 1991 Mt. Pinatubo volcanic eruption, after the 2005 South East Asia earthquake and the tsunami in Aceh.[38] The following factors may promote the transmission and poor outcome from measles:

- **Environment***:* Overcrowding increases the risk of secondary infection, which increases the severity of disease in all age groups.[21] Health workers might fail to recognise measles cases and not give proper care to people with severe infection.[4, 33] Disruption of power supplies and immunisation services interrupt the delivery of measles vaccine to children. General lack of awareness about measles within the community results in failing to seek appropriate health care for the sick and the spread of disease to others;

- **Host***:* All unvaccinated persons are at risk of developing measles, but the risk of death is highest among children between the age of six months and five years. Immunisation non-responders, poor vaccination practices, malnutrition, chronic vitamin A deficiency, and pre-existing diseases increase the risk of death from measles by decreasing the body's immunity.

Bangladesh - One of 150 students at Sahen Cadet Play School in Tangail, receives a measles vaccination during the largest ever vaccination campaign in history. Photo: American Red Cross

Measles can affect many body systems and most deaths occur due to secondary infections of the respiratory system and/or Gastro-Intestinal Tract (GIT). This is summarised in the table below. Remember that the incubation period of measles before onset of fever lasts between ten and twelve days. Measles is mostly infectious after four days before the rash until one or two days after the onset of the rash.

Table 7-12: Clinical presentation of measles

Clinical measles	Complications of measles
Prodromal fever Conjunctivitis Cough Koplik spots Measles rash	Respiratory — croup, bronchiolitis, pneumonia, bacterial super-infections GIT — diarrhoea, severe dehydration, malnutrition CNS — convulsions, encephalitis Blood — anaemia Skin — mouth ulcers Eyes — infections, blindness (Vitamin A deficiency) Ears, nose, Throat (ENT) — middle ear infections, deafness

Note: Very sick children are more likely to develop and die from the viral complications and secondary bacterial infections. Severely malnourished children may have a milder rash but more severe disease.

Case management of measles

Managing cases of measles should be based on the severity of clinical presentation. Case management is summarised in the table below:

Table 7-13: Case management of measles

Measles severity	Case management
Uncomplicated cases	▪ Treatment is supportive (fever control, fluids, nutritional feeding if necessary). ▪ Give vitamin A dose immediately upon diagnosis and another dose on the next day.
Cases with non-severe eye, mouth or ear complications	▪ Give vitamin A dose immediately upon diagnosis and another dose on the next day. ▪ If pus is draining from eyes, clean eyes and treat with 1% tetracycline eye ointment. ▪ If mouth ulcers present, treat with gentian violet. ▪ If pus is draining from ears, clean ears and treat with amoxicillin (1st line) or co-trimoxazole (2nd line) for five days, as per national ARI policy. ▪ Treat malnutrition and diarrhoea, if present, with fluids and diet.
Cases with severe, complicated measles (inability to drink/feed, vomiting, convulsions, lethargy, corneal clouding, extensive mouth ulcers, pneumonia).	▪ Refer to hospital. ▪ Treat pneumonia with appropriate antibiotic. ▪ Treat eye pus drainage or corneal clouding with 1% tetracycline eye ointment. ▪ Give vitamin A dose immediately upon diagnosis and another dose on the next day. If eye signs of vitamin A deficiency are present (i.e. night blindness, Bitot spots, corneal clouding/ulceration), give the child a third dose of vitamin A two to four weeks later.

Source: WHO

Control of measles

Measles control in emergency and post-emergency settings involves two main measures: routine immunization for measles prevention, immunization campaigns in particularly vulnerable populations (camps etc.) and early response to measles outbreaks. Steps in these control measures are outlined in the table below.

Table 7-14: Steps in measles control

Type of control	Case management
Immunization in emergency and post-emergency phases	Immunize population at risk as soon as possible.
	Ideally, all children, **aged 6 months to 15 years**, regardless of vaccination status or disease history, should be vaccinated. However, in resource-poor settings where vaccinating all children aged 6 months to fifteen years is not possible priority should be given to children aged six to fifty-nine months. Expand immunisation to sub-populations with high susceptibility;
	Children receiving vaccine before nine months of age must receive a second measles vaccination, which should be given as soon as possible after nine months of age (with an a one-month interval between doses);
	Vitamin A supplementation should be given to all children aged six months to five years.
Outbreak response	Inform health authorities if one or more suspected cases arise;
	Confirm outbreak and follow WHO guidelines;
	Give priority to case management and immunisation of groups at highest risk (e.g. children aged six months to fifteen years) in non-affected areas;
	Promote social awareness and immunization of previously unvaccinated children particularly those aged six months to five years;
	Conduct a measles immunization campaign;
	Isolation is not indicated.

Source: WHO

Note: it is not harmful to immunise a child who had previously received immunisation. A common cold is not a contraindication against measles immunisation.

Malaria

Malaria is endemic in more than 100 countries in the tropical and subtropical areas. In the last decade, the number of malaria cases has risen at an alarming rate particularly in Africa. This is probably due to the increasing resistance to anti-malarial drugs, ineffective spraying programmes, to the disease invading new geographical areas and being now transmissible at a higher altitude than it was ten years ago, and climate change in the form of warmer temperatures and variations in rainfall patterns (WHO). WHO estimates that there are more than 500 (WHO) million malaria cases annually resulting in more then (WHO) 1 million deaths, of which 90% are in sub-Saharan Africa, about 71% of them among children

Photo International Federation

less than five years of age. In 2008 it is estimated 30% of malaria deaths in Africa are the result of outbreaks of malaria during emergencies (WHO source).

More than 80% of complex emergencies are in malaria-endemic areas. Thus numerous epidemics of malaria have been reported among displaced populations with incidence rates ranging from seventy to 600 per 1000 population.[44, 21, and 29]. In complex emergencies located in high transmission areas, up to 50% deaths are due to malaria. Death rates as high as thirteen per day per 10,000 people were reported in north-eastern Kenya among Somali refugee communities in early 1998 following the El- Nino rains.[1]

Malaria is caused by four species of malaria parasites: *Plasmodium vivax*, *P. ovale,* and *P. malariae* or *P. falciparum.* These parasites are often transmitted through an infected female anopheles mosquito's bite, but transmission through blood transfusions can also occur. An acute illness can develop after a seven-day incubation period. In sub-Saharan Africa, over 90% of infections are due to *P. falciparum* whereas in other parts of the world e.g. East Timor and Afghanistan, have different infection levels for each species and a few cases could have mixed falciparum and vivax infections.

It can be difficult to distinguish infections due to the four malaria species based on clinical symptoms alone. Many infected people, particularly those who are partially immune or have been taking anti-malarial drugs, do not show the signs and symptoms typical of malaria. Vivax malaria can cause anaemia, enlarged spleen and low birth weight in newborns while falciparum malaria can be fatal even in cases without drug resistant malaria. Most deaths from malaria are caused by *P. falciparum.* A small percentage of the total deaths from malaria are also caused by *P. vivax*, predominantly amongst the very young and very old. Case fatality for *falciparum* malaria can reach 10% even in a reasonably equipped hospital.

Bednets distribution - Photo International Federation

Factors for spreading malaria in emergencies include:

- **Agent**: Increased possibilities for parasite breeding can result from environmental changes, inadequate malaria control measures or increasing resistance to anti-malarial drugs following wide-spread self-treatment;

- **Environment:** Emergency situations provide more opportunities for transmission due to insufficient shelter and overcrowding. Vector breeding sites can increase after climate change, environmental deterioration or settlements being located too close to surface water sources. The risk of death is greater where access to malaria treatment is very poor or nonexistent;

- **Host:** Not everyone infected with malaria parasites develops clinical malaria by reason of the level of the host's pre-existing partial immunity. Displaced populations if they have migrated from non-endemic to or through highly endemic areas can be more susceptible to infections due to malnutrition, multiple infections or low immunity.

The following table identifies vulnerable groups at risk from severe malaria and provides the WHO case definitions for prompt identification of individuals requiring immediate treatment.

Table 7-29: Case definitions and vulnerable groups for different malaria parasites

Presentation	Uncomplicated malaria	Complicated malaria
Parasite species	P. falciparum, malaria, ovale, vivax	Only P. falciparum
Case definition for emergencies	Persons with fever or history of it within the last forty-eight hours (with or without nausea, vomiting, diarrhoea, headache, back pain, chills, myalgia) *where other obvious causes of fever have been excluded.*	Persons with fever and symptoms as for uncomplicated malaria but with associated signs of:* disorientation, loss of consciousness, convulsions, severe anaemia, jaundice, hemoglobinuria, spontaneous bleeding, pulmonary oedema, shock.
At risk group	Very young and very old, people with concurrent health conditions. Displaced people of all ages and sexes with low or partial immunity if they move from a low to a high transmission area.	Infants and young children, malnourished individuals, pregnant women, immuno-compromised adults. Displaced people of all ages and sexes with low or no partial immunity if moving from a low to high transmission area.

∗ These manifestations can occur singly or, more commonly, in combination in the same patient.

Note: Other infections can cause clinical illnesses that appear to be malaria. However, in endemic areas where laboratory tests are unavailable, all patients with fevers should be suspected as having malaria.

Prevention

▪ **Insecticide Treated Nets (ITNs):** evidentially can have a protective efficacy similar to most childhood vaccines i.e. use of ITNs can reduce the number of under-five deaths from all causes by about 20% as well as half of the clinical malaria episodes. Insecticide Treated Nets (ITNs) also have a 'community effect' i.e. they protect those sleeping under them as well as those living nearby. The main challenge of large scale ITN distribution is the low re-treatment rates.

▪ **Long Lasting Insecticide Treated Nets (LLINs)** are bed nets impregnated with deltamethritin compound. LLINs are effective for those sleeping under them all night, but provide partial protection for those sleeping in the same room. Long-lasting bed nets do not need re-treatment over their life span.

▪ **Zero fly** is an insecticide impregnated plastic sheeting or tarpaulin used as a temporary roof or floor cover. Most insects do not like Zero fly which provides some protection for its users.

▪ **Indoor Residual Spraying (IRS)** is a highly effective intervention. Application has been limited by various factors such as its high cost, low community acceptance, and risk of insecticide resistance.

▪ **Intermittent Preventive Therapy (IPT)** given throughout pregnancy together with sulfadoxine-pyrimethamine (SP) during the second and third trimester has proved very effective in reducing severe anaemia and clinical malaria in pregnant women as well as the proportion of babies with low birth weight in sub-Saharan Africa. As the emergency situation stabilises, IPT and LLINs distribution can be integrated with other Maternal and Child Health interventions to increase ante-natal care (ANC) coverage and better health outcomes for mother and child. For areas with low sulfadoxine-pyrimethamine resistance, IPT should be introduced as soon as ante-natal care services begin. In areas with confirmed high sulfadoxine-pyrimethamine resistance, the following website should be consulted

▪ (www.who.int/malaria/pregnantwomenandinfants.html). More research is needed to identify other suitable anti-malarials for IPT.

HIV and IPT: Because sulfadoxine-pyrimethamine is less effective among women who are HIV positive, it needs to be administered on a monthly basis. It is also is recommended that all pregnant women receive monthly IPT where ante-natal care seroprevalence for HIV exceeds 10%. HIV positive women on cotrimoxazole prophylaxis do not require IPT. (www.who.int/malaria/pregnantwomenandinfants.html). More research is needed to identify other suitable anti-malarials for IPT.

▪ **HIV and IPT:** Because sulfadoxine-pyrimethamine is less effective among women who are HIV positive, it needs to be administered on a monthly basis. It is also is recommended that all pregnant women receive monthly IPT where ante-natal care seroprevalence for HIV exceeds 10%. HIV positive women on cotrimoxazole prophylaxis do not require IPT.

Case management

Prompt diagnosis and treatment of clinical malaria is the best means for preventing its progression to severe malaria and death particularly during the acute emergency phase when prevention of malaria is difficult. In a high malaria risk area where diagnostic capacity is limited, all patients with fever or history of fever within the past three days should be classified as having malaria until proved differently as shown in the table below.

Table 7-30: Case management of children with fever in malaria areas

Case description	Management principles
In a high malaria risk area all children less than five years who have a fever (or history of fever) should be classified as having malaria.	The high rate of malaria and the risk of disease progression to severe malaria or death justify the presumptive anti-malarial treatment based on clinical diagnosis for children under five.
In low malaria risk or season, children with fever (or history of fever) are classified as having malaria and given an anti-malarial only if they have no runny nose, no measles or other obvious cause of malaria.	Parasitological confirmation of malaria infection is recommended for children under five.

Where resources permit, microscopy can be re-established as soon as possible with good monitoring to ensure accuracy of blood film-making and reading. Malaria is confirmed by demonstrating malaria parasites in thick or thin blood smears. In acute emergency settings, Rapid Diagnostic Tests (RDTs) or dipsticks may be used as they are simple to perform and to interpret and do not require electricity or training in microscopy. RDTs are included in the Interagency Emergency Health Kit's basic units. RDTs can be used by peripheral health workers, other health providers and community volunteers who can be taught the procedure in a matter of hours.[20] For many African countries, however, the widespread use of RDTs for national malaria control is not affordable.

All identified malaria cases require effective anti-malarial treatment. Chloroquine is no longer effective against *P. falciparum* in most sub-Saharan African malaria-endemic countries. A change of national treatment policies, however, has been constrained by the high cost, limited availability and use of alternative anti-malarial therapies. Nevertheless, WHO recommends combination drug therapy that contains an Artemisinin Compound (ACT) as the first line therapy for all *P. falciparum* endemic areas. ACT effectively reduces infection, transmission and retards the development of drug resistance. The most promising ACT is the co-formulated single pill combination of artemether and lumefantrine (CoArtem). Unfortunately, because CoArtem is ten times more costly than chloroquine (USD 1.00 for children, 2.00 for adults). Many countries have adopted ACT as the policy standard, but continue supporting less effective drug regimens.

Some patients with *P. falciparum* infection may develop severe life threatening illnesses and require complex medical management. Pre-referral administration of artesunate

suppository within twelve hours has proven effective reducing the risk of death for patients with severe malaria.

It is not possible to standardise malaria treatment protocols for all displaced populations. The appropriate treatment policy must be based on up-to-date information on drug resistance patterns in the area. This is vital for displaced populations who are especially vulnerable because of low immunity from malnutrition, the lack of any previous exposure to malaria or lack of access to re-treatment if treatment fails. Local health authorities and relief agencies must share the information. As drug resistance develops rapidly, it is also important to evaluate second line or future treatments proactively. Drug efficacy monitoring can be done using WHO's standard procedures.[48] Other causes of treatment failure, such as non-adherence, vomiting and poor quality drugs should also be monitored.

Note: If an emergency situation limits access to patients, agencies should prioritise a single dose treatment protocol and observe all patients for one hour after taking the drugs to make sure they do not vomit and retreat anyone who vomits in less than an hour).

The following table summarises the basic approach to malaria case management. Other measures might be required for patients with complicated malaria.

Table 7-31: Malaria case management

Indication	Treatment
Specific	
Non-falciparum malaria (P. vivax, P. ovale, P. malaria)	Option 1: Chloroquine is first line treatment. Can add Primaquine to destroy liver stages of P. vivax and ovale but not for pregnant women; Option 2: Mefloquine; Option 3: Quinine; Option 4: Artesunate.
Mixed infection (P. vivax/P. falciparum)	Artemisinin Compound (ACT) (except with sulphadoxine-pyrimethamine). If malaria burden is not excessive, laboratory confirmation via microscopy is preferred to Rapid Diagnostic Tests for differentiating species.
Uncomplicated malaria	ACT with SP, amodiaquine or mefloquine For pregnant women in first trimester, quinine or amodiaquine.
Severe P. falciparum malaria	Option 1: Artesunate suppository then IM Artemether or IV Artesunate (except for pregnant women in first trimester) Option 2: IV/IM Quinine then oral Quinine + Doxycycline or Clindamycin (Doxycycline contraindicated in pregnancy) Option 3: IV/IM Quinine then oral ACT (CoArtem, Artesunate/SP.
Complications of malaria	▪ Antipyretics (paracetamol) ▪ IV glucose plus glucose infusion ▪ Haematinics, blood transfusion** ▪ Fluid/electrolyte replacement (ORS, IVF) ▪ Broad spectrum antibiotics for concurrent bacterimea

* Reserve for multi-drug resistant malaria. Given alone or combined with other anti-malarial drugs.

** Blood transfusion is necessary for anaemic patients with high parasitemia. Due to high risk of HIV transmission, transfusions should only be done to save life. See the *Reproductive Health Care in Emergencies* chapter for details on safe blood transfusion

Note: Treatment of Plasmodium falciparum gametocytes with primaquine is no longer recommended, as evidence of its effectiveness is inadequate, and it can be dangerous in glucose 6 phosphate dehydrogenase (G6PD) deficient individuals.

Note: WHO maintains a database of national treatment protocols of emergency affected countries where these protocols exist. It might be recommended that protocols be adapted if necessary in a complex emergency. The database will eventually also include information on drug sensitivity, simple protocols for sensitivity testing and mapping of malaria and malaria risk (epidemiological, climatic, land use, etc) in complex emergency countries.

Control of malaria

Various strategies can be used to control outbreaks of malaria after natural disasters or in refugee settings, depending on the available resources and the local health priorities. Good surveillance is vital as is timely and quality information about malaria incidence that is needed by the Ministry of Health (MoH) and World Health Organisation (WHO) to make informed decisions about outbreak preparedness and response. Below are additional measures to be considered:

- If the outbreak is severe, mass anti-malarial treatment of all patients with fever is justified (preferably with a single dose). Laboratory confirmation may be necessary where drug resistance is a problem or the anti-malarial is expensive;
- Where mortality is high or referral systems are not available, Community Health Workers and volunteers should be trained to identify actively malaria cases and provide home based care for uncomplicated cases;
- Passive case finding for malaria is acceptable in chronic refugee settings when mortality is under control.[45]

Other measures for minimising exposure to malaria vectors/parasites among the affected population might be needed at different levels. Because indoor spraying with residual insecticide ('house spraying') is fast and effective, it has been the most preferred, although it is expensive. With safe insecticides, it is very appropriate during the first two to three months when combined with the introduction of insecticide treated materials as soon as possible (Long Lasting Insecticide Treated Nets (LLINs).

The following table summarises commonly used measures for malaria epidemic control:

Table 7-32: Malaria control measures at various levels, by expected effect

Expected effect	For individual and family protection	For community protection
Reduction of human/ mosquito contact. Destruction of adult mosquitoes.	ITNs*, LLINs, repellents, mosquito coils, protective clothing, screening of houses. Use of domestic space spraying (aerosols).	Site selection. Residual indoor insecticides, space spraying, ultra-low-volume sprays.
Destruction of mosquito larvae.	Peridomestic sanitation, intermittent drying of water containers.	Larviciding of water surfaces, intermittent irrigation, biological control.
Source reduction.	Improve sanitation, wastewater drainage.	Environmental sanitation, provision of piped water, water management.
Social participation.	Motivation for personal and family protection.	Health education, community participation.

* Long Lasting Insecticide Treated Nets
(Source: Malaria control among refugees and displaced populations, WHO 1996).

For more information about source reduction, protection of susceptible groups, and interruption of transmission, read the *Vector Control* chapter.

Meningococcal meningitis

Outbreaks of meningococcal meningitis can occur in any part of the world. However, major outbreaks occur mainly within the semi-arid areas of sub-Saharan Africa, often known as the 'African meningitis belt,' which extends from Ethiopia in the east to Senegal in the west. In these areas, sporadic infections occur in seasonal cycles while large-scale outbreaks have been reported every eight to twelve years during the past fifty years. Meningitis epidemics often reach their peak after twelve weeks and last about six months on average with or without intervention. [15]

Due to climatic change, increased mobility of populations and the adaptation of the bacteria species, shorter intervals have been observed between outbreaks since the 1980s. These outbreaks have also occurred beyond the meningitis belt. Attack rates of meningitis during major outbreaks in Africa range between 100-800 per 100,000 individuals. Several meningitis outbreaks have been reported among displaced populations in Malawi, Ethiopia, Burundi and Zaire.[24] These outbreaks have not been confined to the displaced population, but have been widespread through the whole area.[21] It is predicted that there will be an increased number of outbreaks in future that are very much related to climate change, the occurrence of new strains (W 135) and slight changes amongst other strains.

Meningitis is a very deadly bacterial infection of the central nervous system. Large outbreaks of meningitis are mainly caused by *Neisseria meningitidis*, better known as meningococci types A, B and C. 90% of outbreaks are caused by meningococci type A, but the W 135 strain is spreading.

Note: Meningitis due to other micro-organisms (viruses, fungi, TB, etc) does not cause epidemics.

The disease is transmitted by direct contact with respiratory droplets from the nose and throat of infected people. [2, 29] While mainly a disease of very small children, meningitis also affects older children and young adults (up to thirty years), especially those living in crowded conditions.[29] The average incubation period is four days, ranging between two and ten days. The case fatality of meningitis depends on the time between the onset of the clinical disease and the start of proper medical care. Untreated meningitis has a case fatality rate of 50%, which can drop to 10% with treatment.[29]

The following risk factors may increase the transmission and risk of death from meningococcal meningitis:

- **Agent**—The meningococci can develop resistance to commonly used antibiotics;
- **Environment**—Opportunities for infection are increased by overcrowding, the dry season, in endemic zones, high rates of acute respiratory infections, insufficient hygiene, poor housing, limited access to health services and delayed detection of outbreaks;
- **Host**—The population might be more susceptible to infection due to pre-existing infections or malnutrition. Children less than one year are most susceptible to infections.

Meningococcal disease can be either present as *meningococcal meningitis* (more common especially in epidemics) or *meningococcal septicaemia* (uncommon in epidemics, but highly fatal). Both forms of the disease can be present in an individual at the same time. A classic case of meningococcal meningitis is easily diagnosed. The following table summarises its clinical presentation:

Table 7-15: Clinical presentation of meningococcal meningitis

Typical presentation	Atypical presentation (Infants under 1 year)
Acute onset of intense headache, high fever, nausea, vomiting, stiff neck, photophobia, impaired consciousness, convulsions, coma.	Irritability, refusal to feed, vomiting, fits, lethargy, bulging fontanel. **Note**: Onset is not always rapid. A stiff neck may be absent.

Note: Meningococcal septicaemia is difficult to diagnose outside an epidemic since the stiff neck symptoms are usually absent and the rash or purpura may not be obvious.

Case management

Sub-Saharan countries' health care systems are generally weak. During major epidemics, it is impossible to admit all suspected cases and ambulatory treatment (oily chloramphenicol) combined with mass vaccination campaigns is commonly used to reduce the impact of outbreaks.

Because meningococcal meningitis can be treated effectively, efforts should be focused on ensuring vaccines, drugs and trained staff are available. This saves lives and reduces disability and deaths during outbreaks. Engaging community leaders and volunteers to raise disease awareness and do community mobilisation during vaccination campaigns has proven highly effective. Patients with meningococcal meningitis should be managed according to the following principles: [41]

- Meningococcal meningitis is potentially fatal and each case should be seen as a *medical emergency*.
- *Admission to a hospital* or a health centre is necessary for diagnosis and treatment of cases.
- *Antimicrobial therapy* is essential and should be combined with supportive treatment.
- As patients' contagiousness is moderate and disappears quickly after antimicrobial treatment, *special facilities for isolation of the patient are not necessary*.

Community health worker and volunteer training is needed to ensure early detection and prompt treatment of cases. Anyone suspected of having meningitis should be referred to a health facility or hospital. Simple techniques for diagnosing meningitis should be used where specialised techniques are not available (such as lumbar punctures and culture of fluids). If several suspected cases of meningitis develop a rash, assume that they have meningococcal meningitis and do the following:

- Even if laboratory facilities are available, treatment should be started before results are known[41].
- If lumbar punctures are possible, do them and send the fluid to a laboratory to confirm the diagnosis and to determine the type/strain of the causative agent for the meningitis outbreak.
- Care for each case in a separate area until twenty-four hours of treatment has been given.
- Keep accurate records of the number of cases and their ages.

The following table summarises the management of meningitis in epidemic situations:

Table 7-16: Meningitis case management

Age group	Probable pathogens	Antimictrobial therapy (First Choice)	Antimictrobial therapy (Alternative)
In epidemic situations All age groups	N. meningitidis	Penicillin G or Oily Chloramphenicol	Ampicillin Ceftriaxone or Cefotaxime Cotrimaxozole
In non epidemic situations Adults and Children > five years	N. meningitidis S.pneumoniae	Penicillin G or Oily Chloramphenicol	Ampicillin Ceftriaxone or Cefotaxime Cotrimaxozole
Children 1 month – five years	H. influenzae S. pneumoniae N. meninigitidis	Ampicilin or Amoxycillin Chloramphenicol	Ceftriaxone or Cefotaxime
Neonates	Gram negative bacteria Group B streptococci Listeria	Ampicllin and Gentamycin	Ceftriaxone or Cefotaxime Chloramphenicol

Source: WHO

Control of meningitis

The simplest way of controlling the spread of meningitis during an outbreak is to prevent overcrowding. Other control measures include:

- **Early Treatment***: Actively finding cases and promptly treating them with a single injection of long-acting oily chloramphenicol (tifomycin), long-acting penicillin or ceftriaxone[2, 21, 31]. The dose of antibiotic can be repeated after twenty-four to forty-eight hours for patients who do not improve immediately.

- **Mass Immunisation***: An effective meningitis vaccine is available, which can control meningitis outbreaks due to serotypes A, C and W 135. A mass immunisation campaign should only be carried out at the onset of an outbreak. It is not useful if the epidemic is on the decline. Routine immunisation of young children against meningitis is not recommended within the Expanded Programme of Immunisation programme for the following reasons:

  - Currently available vaccines (against meningococcal types A, C, Y, and W135) do not provide enough protection to children less than 1 eighteen to twenty-four months or who might have to be administered in several doses. It protects vaccinated people aged more than two years for one to three years.

  - Possibility of carrying out such vaccination is questionable since the vaccines have limited effectiveness in young children[41].

  - Limited availability and relatively high cost of the meningitis vaccine.

  (See the Immunisation in Emergencies section for more details on immunisation for meningitis).

- **Mass Chemoprophylaxis***: WHO no longer recommends mass chemoprophylaxis during meningitis outbreaks. Carrying out selective chemoprophylaxis with rifampicin for household contacts may be effective but expensive. Because mass or selective chemoprophylaxis demands extensive resources, it is recommended that meningitis control be limited to active case finding and early treatment.[2, 29, and 21].

Tuberculosis

Tuberculosis (TB) is a contagious disease, someone in the world is newly infected with TB bacilli every second. The World Health Organization estimates that the largest number of new TB cases in 2005 occurred in the South-East Asia Region, which accounted for 34% of incident cases globally. However, the estimated incidence rate in sub-Saharan Africa is nearly twice that of the South-East Asia Region, at nearly 350 cases per 100 000 population. It is estimated that 1.6 million deaths resulted from TB in 2005. Both the highest number of deaths and the highest mortality per capita are in the Africa Region. The TB epidemic in Africa grew rapidly during the 1990s, but this growth has been slowing each year, and incidence rates now appear to have stabilized or begun to fall.

TB is a major cause of chronic illness in many parts of the world accounting for 25% of all avoidable deaths in developing countries. About one-third of the world's population is infected and each year there are 9 million new cases with 95% of TB cases being in developing countries. Of these cases, 75% are within the adult age group. [49]

Over 85% of refugees originate from, and remain in countries with a high prevalence of TB, for example:
- In 1989, 25% of all adult deaths in one refugee camp in Somalia was due to TB;
- In 1990, 38% and 50% of all adult deaths in two camps in Eastern Sudan were due to TB; [49]
- In the 1990s in Kenya, the incidence of new patients with infectious TB in refugee camps was four times the incidence of the local population. This placed an extra burden on the Kenyan TB programme.

TB is caused by *Mycobacterium.* Leprosy is caused by a related Myco-bacterium. Infected individuals release contagious droplets when they cough, talk or sneeze. The droplets can be inhaled by susceptible adults and children. As long as viable tubercle bacilli are being discharged in the sputum, the disease is communicable. People with laryngeal TB are highly contagious. The most dangerous period for developing clinical disease is the first six to twelve months after exposure.[2]

The following factors increase the spread of disease or development of disease complications:

- **Agent**: Transmission of TB depends on both the number and virulence of bacilli released. There is also an increase in multi-drug resistant infections mainly as a result of incorrect or incomplete treatment.[21] The recent and most worrisome development is the occurrence of extreme drug resistance strains, which do not respond to all commonly used first line and some second line drugs. The appropriate treatment for such patients is extremely expensive and takes a long time. The reported increase of Extreme Drug Resistance XDR TB patients in Southern Africa might increase the risk of further disease transmission and also enhance the spread of HIV/AIDS.

- **Environment**: Poor living conditions with overcrowding and inadequate ventilation can increase the spread of infectious agents from infected persons to susceptible hosts. A high rate of urbanisation takes place in countries with a high TB prevalence. Lack of access to clinical and to diagnostic services results in delayed diagnosis and a delayed start in the anti-TB treatment.

- **Host**: The risk of infection is highest in children aged less than three and lowest in late childhood with incidence increasing again among adolescents, young adults and the very old. Young children may die from military TB or TB meningitis. The risk of death from TB is higher among people with other illnesses as well as among the underweight and under-nourished.[21] In some sub-Saharan African countries, 30% to 70% of TB-infected people have concurrent HIV infection which has become the leading cause of death amongst TB patients. Although HIV-infected patients experience similar signs and symptoms of TB as non-HIV infected

individuals, a person infected with HIV is twenty-five times more likely to progress from infection to active disease and can result in the more severe forms of TB (e.g. meningitis) especially in children.

Note: A large proportion of clinical disease among African adults arises from reactivation of latent infections.

Prevention

The most effective method of preventing TB transmission is its diagnosis and the cure of its infectious. Community education is also essential to promote the self referral of TB suspects, to increase understanding about the need for adhering to treatment and to decrease TB stigma. Cured patients are often helpful teachers and supporters of new patients.

Other preventive measures in major population displacement settings include the following:

- Bacille Calmette Guerin (BCG) vaccination prevents severe forms of TB among children and is recommended for all newborns through the Expanded Programme of Immunisation programme. BCG is not recommended for adults.

- Reducing overcrowding and ensuring good ventilation in health facilities.

- Separating hospitalized patients with TB from others for the first two weeks of treatment.

- Separating infectious TB patients from HIV positive individuals.

- Education on HIV prevention and providing condoms to TB patients through TB clinics.

Note: Isoniazid prophylaxis is not recommended for infants except for those being breast-fed by smear positive mothers. If the infant is well, isoniazid should be given for the first six months before the BCG vaccine is administered. If the Internally Displaced Persons/refugee settlement is suddenly closed, Isoniazid can be stopped and the child vaccinated with BCG before departure (preferably one week later).

Case management

Although TB may be a major problem among disaster affected and displaced persons, it does not demand immediate attention during the acute phase of the emergency. However, once diseases such as measles, malaria and diarrhoea have been controlled, TB treatment programmes should be started in order to cure infected persons and prevent the disease from spreading. It is vital to agree on standard case definitions as well as standard treatment protocols, especially if the anti-TB regimen used by the displaced or disaster affected population is different from the anti-TB treatment for the host population.

The diagnostic is essential
Photo: International Federation

The following table summarises the clinical presentation of tuberculosis:

Table 7-18: Clinical presentation of tuberculosis

Pulmonary tuberculosis	Extra-pulmonary tuberculosis
Can occur with or without cavities. If untreated, 50% of cases will die within five years, 25% will be self-cured, and 25% will remain ill with chronic infectious TB.	May occur in 15% to 20% of cases.
Key signs and symptoms in TB suspects > 15 years: ▪ productive cough > 3 weeks, or ▪ haemoptysis; and ▪ significant weight loss. **Other common but less suggestive symptoms:** ▪ chest pain ▪ breathlessness ▪ fever / night sweats ▪ tiredness; and ▪ loss of appetite.	- Peripheral lymphadenitis, with swelling of cervical or auxiliary lymph nodes, chronic evolution with sinus and production of caseous discharge; and - Ascites due to TB peritonitis, without liver disease, or other symptoms of cirrhosis, with lymphocytes and protein in the fluid extracted by puncture. **Less common presentation:** - For assessment and definitive diagnosis (severe, life-threatening forms, with dyspnoea, coma or other neurological symptoms (miliary TB, TB meningitis)); or - X-ray for cases with suspected TB pericarditis, TB arthritis, osteomyelitis (including Pott's disease (vertebral TB)).
80% are smear positive Symptomatic contacts need to be tested.	

Note: Children may produce no sputum and have non-specific symptoms.

Managing TB cases begins by confirming the diagnosis. People with TB infection are primarily identified via sputum-microscopy which can be fairly complex. Sputum samples need to be examined under light microscopy by a well trained and experienced laboratory technician.

Patients come to take their pills, with their prescription from the state institution Photo: International Federation

Once TB is diagnosed and before initiating treatment, all patients must be questioned carefully on whether or not they have ever taken anti-TB drugs previously. Patients are then classified into four different categories using the following criteria:

▪ Site of disease (pulmonary or extra-pulmonary);

▪ Severity of disease;

▪ Bacteriological status (sputum smear positive or negative); and

▪ History of anti-TB treatment (new or previously treated):

▪ New case - a patient who has never had or who has taken anti-TB drugs for less than four weeks;

▪ Peviously treated case - a patient who has ever received anti-TB treatment for more than one month.

Treatment categories are essential for prioritising TB treatment according to public health risk. Category I, the highest priority includes newly-diagnosed patients with pulmonary TB or severe extra-pulmonary TB and children with a score greater than seven. Category III is the lowest priority.

The DOTS (Directly Observed Therapy Short Course) strategy developed by WHO has proved effective for limiting the spread of TB among disaster affected or displaced populations. In DOTS, all patients with confirmed TB take anti-TB drugs for six to eight months under the observation of volunteers, health workers or community leaders. Various short standard drug combinations are issued in two phases:

▪ **Initial Phase —** treatment with three to five anti-TB drugs given daily or three times weekly under direct observation for two to three months. These drugs rapidly reduce the number of bacilli and prevent further disease spread. **Note**: *All doses containing rifampicin are issued under observation;*

- ▪ **Continuation Phase** — treatment with two to three drugs given three times a week under direct observation for four to six months. In some cases (e.g. during refugee repatriation), two drugs for six months given daily unsupervised, but in fixed-dose combination form. The sterilising effect of these drugs eliminates any remaining bacilli and prevents subsequent relapse.

The following table summarizes the treatment regimens for different TB categories.

Table 7-19: Recommended treatment regimen for different categories of TB[36]

Category	Diagnosis of patient	Treatment priority	Initial phase	Continuation phase
I	▪ New smear-positive pulmonary TB ▪ New smear-negative pulmonary TB ▪ New cases of severe forms of extra-pulmonary TB ▪ Children with score of 7 or more	High priority because they pose a high public health risk	2EHRZ (2SHRZ) or $2\ E_3\ H_3\ R_3\ Z_3$ ($2\ S_3\ H_3\ R_3\ Z_3$)	$4\ H_3\ R_3$ (6 HE)
II	Treated but sputum smear-positive: ▪ Relapse after treatment ▪ Treatment failure ▪ Treatment after interruption	Medium priority	2 SHRZE / 1 HRZE	$5\ H_3\ R_3\ E_3$
III	▪ New smear negative pulmonary TB (not in category I) ▪ New cases of less severe forms of extra-pulmonary TB	Low priority and should not get treatment at initiation of TB programme or if resources are scarce	$2\ H_3\ R_3\ Z_3$	$4\ H_3\ R_3$ (6 HE)

E = Ethambutol; H = Isoniazid; R = Rifampicin; Z = Pyrazinamide; S = Streptomycin

The number before the drug abbreviations is the duration of that phase in months. The subscript after a drug abbreviation (e.g. [3]) represents the number of doses of that drug per week.

Note: Some authorities recommend a seven-month continuation phase with daily isoniazid and rifampicin (7HR) for Category I patients with serious forms of disease, e.g. TB meningitis, military TB, spinal TB with neurological signs. All TB drugs are safe in pregnancy and lactation except streptomycin which can be substituted with ethambutol.

Although most TB patients can complete treatment on an outpatient basis, those who are very ill when starting their treatment might require hospital admission. Ongoing education is essential for sputum positive TB patients and for their family members about preventive measures such as covering the mouth when coughing. Nutritional supplements and rehabilitation can benefit those who might be at risk of malnutrition.

The active follow-up of all defaulters (non-adherers and patients who interrupt their treatment even if it is only one attendance) is critical for assuring good treatment adherence that will cure TB patients. Measures to promote adherence can include:

- ▪ Direct observation of treatment;
- ▪ Home visits to trace defaulters;

- ▪ Good relationship between staff and patient;
- ▪ Continuing education programme for staff, patients and families, and the community; and
- ▪ Clinic setting acceptable to patients and staff.

Note: much of this work can be done by community volunteers, CHWs or other members of the community.

Tuberculosis treatment for children

About 10% of all TB patients are children whose infection was acquired from an adult family member with sputum positive TB. Diagnosing TB in children is more difficult because they often have non-specific symptoms without a productive cough and their sputum is rarely positive. Since children represent about 10% of all TB cases, other techniques for diagnosing TB in children are needed. The tables below present score charts for diagnosing childhood TB after one month of nutritional rehabilitation.

Table 7-20: Score chart for diagnosis of tuberculosis in children

Feature	0	1	3	Score
Duration of illness	< 2 weeks	2 – 4 weeks	> 4 weeks	
Nutrition (% WFA)	> 80	60 – 80	< 60	
Family TB (Past or present)	None	Reported by family	Proved sputum positive	

Table 7-21: Score chart for diagnosis of tuberculosis in children[46]

Other features	Score
Positive tuberculin test	3
Large painless lymph nodes, firm, soft, sinus in neck, axilla, groin	3
Unexplained fever, night sweats, no response to malaria treatment	2
Malnutrition, not improving after four weeks	3
Angle deformity of spine	4
Joint swelling, bone swelling or sinuses	3
Unexplained abdominal mass or ascites	3
Central nervous system signs (change in temperament, fits or coma)	3
Total score	

Note: When score is 7 or more, treat for TB.

Anti-TB drug regimens for children are the same as for adults except that streptomycin should be avoided. Drug dosages will vary according to the children's weight and further adjustments during the course of the treatment are needed as children can rapidly regain lost weight.

Management of TB/HIV

All patients with concurrent TB and HIV infection need monitoring for opportunistic infections and referred for a thorough clinical assessment and appropriate treatment. Patients often respond well to TB treatment, but can suffer side effects from the TB drugs. Because severe, even life-threatening reactions occur more frequently following treatment with Thiacetazone, this anti-TB drug is not recommended for use in emergency situations.

Note: In general, routine HIV testing for displaced people with TB is not recommended due to possible stigmatization.

Control of tuberculosis

The aim of TB control in refugee situations is to reduce the morbidity, mortality and transmission of TB. According to WHO, TB control strategy requires:

- Political commitment to TB control by authorities at different levels;
- Passive case-finding and diagnosis by smear microscopy;
- Treatment by directly observed therapy, using short-course chemotherapy; and
- One person in charge of managing the TB programme;
- A regular drug supply system;
- Health workers trained in the management and application of TB control;[46]
- Monitoring TB patients by a standard TB recording and reporting system.[50]

Although the short-course anti-TB treatment with multiple drugs can limit the spread of TB in crowded settlements, establishing a TB control programme in some situations can cause more harm than good for the following reasons:

- TB requires six to eight months treatment that might not be completed by migrating populations;
- Treatment failure may lead to the development of multi-drug resistant bacilli[50].

TB control programmes might be appropriate under certain conditions as shown in the table below:

Table 7-22: Implementation of a TB control programme

TB programme not recommended	TB programme recommended
During the emergency phase following the population displacement.	Emergency phase is over (death rates <1 per 10,000 population per day.
During warfare of significant insecurity.	Security in the camp envisaged for at least six months.
Very unstable population (e.g. nomadic or population moving up and down a border.	Stability of the camp for at least 6 months.
Major health problems not fully addressed.	Basic needs of water, adequate food, shelter and sanitation are available. Laboratory services for sputum smear microscopy will be available. Essential clinical services and basic drugs are available. Data indicate that TB is an important health problem.
Limited financial resources.	Sufficient funding and drug supplies available for at least twelve months.

Agreement on whether or not to start a TB programme and the TB control policies to be implemented should be reached as early as possible among all partners (national TB control authorities and NGOs). Drug procurement, establishment of a laboratory and training, can take over three months to complete.

The following table summarizes key steps in setting up a TB control programme:

Table 7-23: Key steps in establishing a TB control programme

1. Identify lead agency i.e. NGO, NTP	8. Agreement with NTP authorities of host country on: ▪ Integrating refugee TB control programme with NTP; ▪ Drug regimens to be used; ▪ Coverage of local population in TB control programme; ▪ Referral of seriously-ill patients to local hospitals; ▪ Laboratories suitable for quality control of smear examination; ▪ Procurement of drug stocks and reagents; ▪ Procedures for follow up of cases in repatriation phase; ▪ Programme evaluation.
2. Prepare budget	
3. Appoint TB Coordinator (possibly 1 per 50,000 population) with a contract for at least twelve months	
4. Assess staff needs, develop job descriptions, and recruit staff	
5. Train staff - TB coordinators, nurses, laboratory technicians, community health workers	
6. Identify secure storage facilities	
7. Produce local TB control protocol	9. Establish reporting system

HIV/AIDS

HIV (Human Immunodeficiency Virus) infection has become the fourth biggest killer. Every day, over 6800 persons become infected with HIV and over 5700 persons die from AIDS, mostly because of inadequate access to HIV prevention and treatment services.

In 2007, advances in the methodology of estimations of HIV epidemics applied to an expanded range of country data have resulted in substantial changes in estimates of numbers of persons living with HIV worldwide. The estimated number of persons living with HIV worldwide in 2007 was 33.2 million [30.6–36.1 million], a reduction of 16% compared with the estimate published in 2006 (39.5 million [34.7–47.1 million]) / (UNAIDS/WHO, 2006)**.** The single biggest reason for this reduction was the intensive exercise to assess India's HIV epidemic, which resulted in a major revision of that country's estimates. Important revisions of estimates elsewhere, particularly in sub-Saharan Africa, also contributed. Of the total difference in the estimates published in 2006 and 2007, 70% are due to changes in six countries: Angola, India, Kenya, Mozambique, Nigeria, and Zimbabwe. In both Kenya and Zimbabwe, there is increasing evidence that a proportion of the declines is due to a reduction of the number of new infections which is in part due to a reduction in risky behaviours.*[18]*
http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf

Although the prevalence among many displaced populations is not known, HIV/AIDS has become a serious problem in emergencies. Many countries affected by conflict also have a high HIV prevalence with mortality rates from HIV/AIDS exceeding conflict-related mortality. Since the beginning of the epidemic, the cumulative total of AIDS orphans (defined as those who have lost their mother before reaching the age of fifteen) has raised to *11.2 million.[18]*

Two types of retrovirus have been identified as causative agents for HIV: type 1 (HIV-1) found worldwide, has many sub-types (A to K) and is the main cause of global pandemic; the less aggressive or transmissible type 2 (HIV-2) has an associated slower disease progression and is mainly found in West Africa, Mozambique and Angola.*[2]*

HIV infection can be transmitted by contact with contaminated blood or bodily fluids. Up to 90% infections among adults and adolescents are acquired via unprotected sexual contact while 5% to 10% of HIV transmission occurs through blood transfusion and

contaminated surgical instruments, syringes and needles. More than 90% of children are infected by their HIV positive mothers who infect their children during pregnancy, delivery or while breastfeeding.

Note: Even though HIV transmission through breastfeeding is possible, WHO continues to recommend this form of feeding for developing countries where the benefits of breastfeeding outweigh the risk of HIV transmission.

Note: In emergencies, when seropositive mothers deliver or in areas where HIV prevalence is high, HIV prophylaxis should be used by treating the mother at the onset of labour with Nevirapine and also the newborn. There are other similar schemes, but the Nevirapine approach is most convenient. The prophylaxis benefits the baby to great extent, even when breastfed afterwards. In some countries, this is already widely practised while in others it needs scaling up. Consult, therefore, the MoH to confirm if the ARV prophylaxis is acceptable.

The natural history of HIV infection comprises of an acute/primary phase that may last up to six months followed by an early/clinically latent phase that typically lasts three to ten years. AIDS is a fatal clinical condition that develops in the late clinical stage of the HIV infection and is characterised by the ultimate immune collapse. Despite significant advances in HIV/AIDS research, AIDS remains a disease without a cure. Available antiretroviral drugs only arrest the disease's progression and improve the quality of life.

The figure below illustrates the major stages of HIV and possible opportunities for interventions.

Figure 7-8: HIV/AIDS timeline
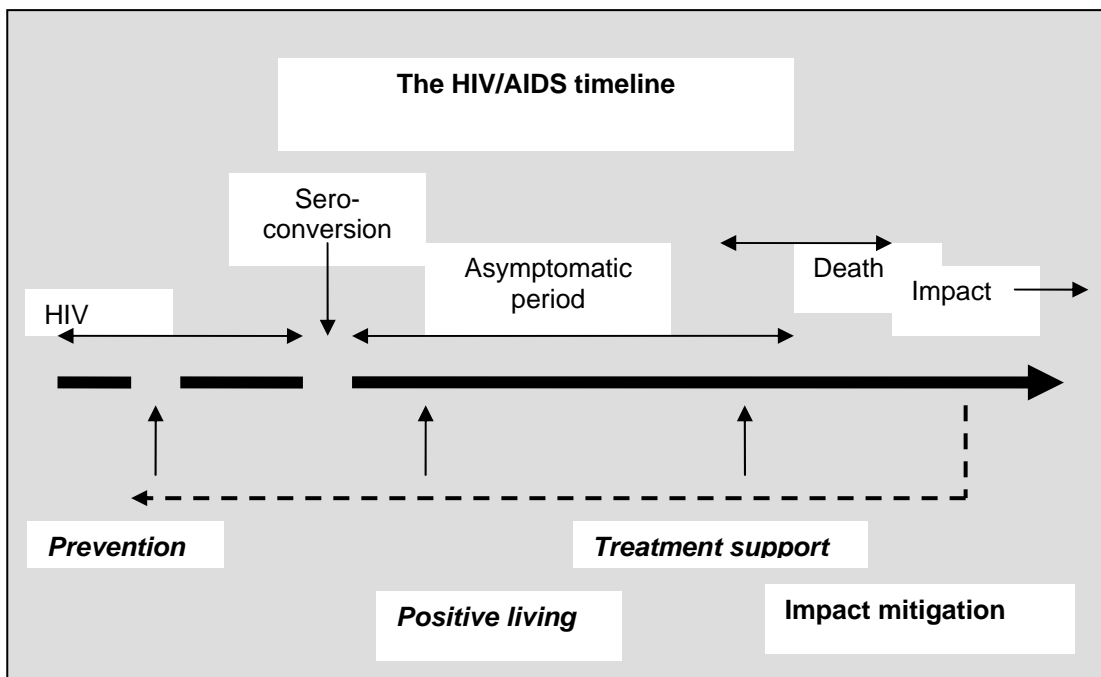
The following factors can promote the spread of HIV/AIDS:

▪ Agent: the HIV virus differs from other disease causing organisms because it is not experienced as a single event. People can acquire multiple HIV infections with different species over time, which are constantly undergoing mutation and developing resistance to existing antiretroviral treatment. Secondly, the virus continually interacts with one's immune system, gradually destroying the body's CD4 lymphocytes to defeat the body's capacity to fight both HIV and other opportunistic infections;

- ▪ Environment: The root causes of complex emergency situations such as insecurity, poverty, political instability, conflict and powerlessness fuel the rapid spread of the HIV/AIDS infection. The risk of transmission among displaced populations is greater be because of increased sexual violence, social disruption of families and communities and the weakening of social norms which lead to unsafe sexual practices. Inadequate resources can hamper HIV/AIDS prevention and care resulting in low general awareness information on HIV/AIDS, the lack of universal precautions, unavailability of condoms and increased HIV transmission via contaminated blood transfusion and mother-to-child transmission;

- ▪ Host: Evidence shows that in emergency settings, the risk of HIV exposure can vary for different populations:
    - ▪ War can accelerate HIV transmission among displaced communities with initially high HIV prevalence through rape and sexual exploitation although it can be difficult to prove that victims were not infected prior to being raped;
    - ▪ The risk of HIV transmission is low wherever HIV prevalence rates are initially low and a displaced population remains isolated. This situation was observed in Sierra Leone and Angola despite the decades of war.

Migration of displaced populations with low pre-conflict prevalence levels to urban areas can increase HIV exposure as was observed in Sierra Leone between 1991 and 2002. On the other hand the risk of HIV transmission for a *host* population can increase after the influx of a population with high pre-conflict prevalence levels of HIV. An example of this situation is when Zambian refugees were being repatriated to Angola with low HIV prevalence.

- ▪ People already infected with HIV suffer rapid physical deterioration during natural disasters or complex emergencies due to lack of food, clean water, hygiene, depleted household income and greater medical expenses.

- ▪ Presence of peacekeepers, military forces, and other armed groups may increase risk of HIV/AIDS transmission.

- ▪ Children are more vulnerable due to loss of parents, lack of education and sexual exploitation.

Figure 7-9: Example of poor media reporting

Various media reports made claims about the spread of HIV among Internally Displaced Persons (IDPs) in Burundi, Colombia, Liberia, Nepal, Somalia and Uganda despite the fact that HIV prevalence has never been measured in these populations. Although news coverage about the HIV situation in Sudan has attempted to provide a more balanced and informed account of the reality on the ground, no mention was made that the 1% HIV prevalence among IDPs was the same as the general non-displaced Sudanese population in 2002. Such information could help to quell growing fears that IDPs are responsible for spreading HIV in the country; a claim which remains groundless.

Minimum HIV/AIDS intervention in emergencies

HIV and AIDS constitute not just a health issue but a problem that affects the socio-cultural fabric, human rights and long-term economic well-being of IDPs as well as the local population with which they interact. For many years humanitarian agencies did not realise the need for preventing HIV in the acute emergency phase due to competing priorities, lack of both funds and technical know-how. Since 2000, there has been increasing recognition of the need to address HIV/AIDS within a wider humanitarian response for high as well as low HIV/AIDS prevalence settings. If not, the long-term impact of HIV/AIDS might gradually exceed the initial crisis event and reverse gains made through other humanitarian efforts.

Below are the ten objectives of UNHCR's HIV and Refugees Strategic Plan for 2005-2007.

Figure 7-10: Objectives of UNHCR's HIV and refugees strategic plan

1. **Protection** ensures that refugees, asylum-seekers and other persons of concern who are affected by HIV and AIDS can live in dignity, free from discrimination, that their human rights are respected and that they can enjoy the highest attainable standard of physical and mental health without discrimination;

2. **Coordination and mainstreaming** ensure that HIV policies and interventions for refugees are coordinated, mainstreamed and integrated with those at the international, regional, sub-regional, country and organisational levels;

3. **Durable solutions** develop and incorporate HIV policies and interventions into UNHCR's programmes for durable solutions including voluntary repatriation, local integration and resettlement in order to mitigate the long-term effects of HIV.

4. **Advocacy** for HIV-related protection, policy and programme integration and sub-regional initiatives for refugees and other persons of concern in a consistent and sustained manner at all levels;

5. **Quality HIV programming** ensures appropriate and integrated HIV interventions for refugees, Internally Displaced Persons, returnees and other persons of concern in accordance with national programmes in host countries and countries of return;

6. **Prevention** reduces HIV transmission and HIV morbidity through the implementation of culturally and linguistically appropriate health and community based interventions;

7. **Support, care and treatment** reduces HIV morbidity and mortality and include access to antiretroviral therapy when available to surrounding host populations when appropriate;

8. **Assessment, surveillance, monitoring and evaluation** improves programme implementation and evaluation;

9. **Training and capacity building** improve HIV related skills and capacities of UNHCR, its partners as well as refugees and other persons of concern;

10. **Resource mobilisation** increases funds and moves beyond traditional donors to ensure that the objectives stated in this strategy are achieved.

HIV and AIDS interventions must not be implemented in parallel, but integrated within and complementary to existing programmes. The following matrix proposes multi-sector interventions that can be applied to different emergency phases in any HIV prevalence setting.

Table 7-33: Guidelines for minimum HIV/AIDS interventions in emergency settings

Sector response	Emergency preparedness	Minimum response during acute emergency phase	Comprehensive post-emergency response
Assessment and monitoring	▪ Conduct capacity and situation analysis on HIV/AIDS; ▪ Map current HIV/AIDS services and high risk practices (including injection drug use); ▪ Assess current practices when applying of universal precautions; ▪ Assess HIV/AIDS education options for youths; ▪ Develop indicators and tools.	▪ Assess baseline data; ▪ Set up and manage shared database; ▪ Monitor activities.	▪ Maintain database; ▪ Assess data on HIV/AIDS prevalence, knowledge, practice and impact; ▪ Monitor and evaluate all programmes; ▪ Draw lessons from evaluations.

7

Control of communicable diseases

Sector response	Emergency preparedness	Minimum response during acute emergency phase	Comprehensive post-emergency response
Protection	▪ Review existing protection laws and policies; ▪ Promote human rights and best practices; ▪ Minimise risk of sexual violence, exploitation and discrimination; ▪ Train uniformed forces and humanitarian workers on HIV/AIDS and sexual violence; ▪ Train staff on HIV/AIDS, gender and non-discrimination.	▪ Prevent and respond to sexual violence and exploitation; ▪ Protect orphans and separated children; ▪ Ensure access to condoms for peacekeepers, military and humanitarian staff.	▪ Involve authorities to reduce HIV-related discrimination; ▪ Scale up prevention and response to sexual violence and exploitation; ▪ Strengthen protection for orphans, separated children and young people; ▪ Institutionalise training for uniformed forces on HIV/AIDS, sexual violence and exploitation and non-discrimination; ▪ Set up HIV-related services for demobilised personnel.
Water and sanitation	▪ Train staff on HIV/AIDS, sexual violence, gender and non-discrimination.	▪ Consider HIV/AIDS in water and sanitation planning.	▪ Establish health management committees; ▪ Organise awareness campaigns on hygiene and sanitation targeting people affected by HIV.
Shelter and site planning	▪ Ensure safety of potential sites	▪ Establish safely designed sites	▪ Plan orderly movement of displaced
Education	▪ Train teachers on HIV/AIDS, sexual violence and exploitation.	▪ Ensure children's access to education; ▪ Prevent discrimination by HIV status.	▪ Educate girls and boys (formal and non-formal); ▪ Provide life skills-based HIV/AIDS education; ▪ Monitor and respond to sexual violence and exploitation in educational settings.
Prevention via BCC/IEC	▪ Develop basic BCC/IEC strategy; ▪ Develop culturally appropriate IEC materials in local language; ▪ Involve key beneficiaries; ▪ Conduct awareness campaigns; ▪ Store key documents outside potential emergency areas.	▪ Provide information on HIV/AIDS prevention and care.	▪ Scale up BCC/IEC; ▪ Monitor and evaluate activities.

Sector response	Emergency preparedness	Minimum response during acute emergency phase	Comprehensive post-emergency response
Health	▪ Adapt/develop protocols; ▪ Train health workers on universal precautions, STI and OI treatment and PEP; ▪ Train peer educators; ▪ Plan and stock medical supplies and PEP prophylaxis; ▪ Plan quality assurance mechanisms; ▪ Develop instruction leaflets; ▪ Train staff on RH issues and kits; ▪ Plan for gender based sexual abuse prevention; ▪ Support existing prevention and care initiatives; ▪ Check PMTCT protocol on Nevirapine prophylaxis.	▪ Ensure access to basic health care for most vulnerable groups; ▪ Provide basic RH services; ▪ Provide GBSV prevention, abuse and case actions; ▪ Ensure safe blood supply; ▪ Ensure universal precautions; ▪ Ensure access to safe delivery and Nevirapine prophylaxis.	▪ Forecast longer-term needs, secure regular supplies; ▪ Ensure appropriate training for staff; ▪ Palliative and home-based care ▪ Treatment of OIs and TB; ▪ Provision of ARV treatment; ▪ Safe blood transfusion services; ▪ Comprehensive RH services; ▪ Ensure/monitor/reinforce universal precautions in health care; ▪ Use of Nevirapine – or equivalent prophylaxis.
HIV at Workplace	▪ Review personnel policies for PLWAs working in humanitarian operations; ▪ Develop policies to minimise discrimination; ▪ Stock materials for PEP.	▪ Prevent discrimination by HIV status by staff management; ▪ Provide PEP prophylaxis to health workers.	▪ Build capacity for people living with AIDS support groups; ▪ Establish workplace policies to eliminate discrimination against people living with AIDS; ▪ PEP for all humanitarian workers readily available; ▪ Access to condoms, where possible.

Although HIV interventions cannot be considered a priority in low prevalence settings, strong advocacy can prompt key actors to apply the minimum response appropriate to a particular situation. For high HIV/AIDS prevalence settings, adopting the above guidelines is more urgent in order to mitigate the HIV/AIDS epidemic's. Determining which interventions are appropriate for natural disasters depends on the evolution of the disaster, the existing HIV prevalence and the government authorities', humanitarian agencies' and donors capacity and readiness.

Note: An essential minimum package for HIV prevention has been designed to address the above priorities for a population of 10,000 persons per month. For more details about Minimal Initial Service Package and HIV/AIDS, refer to the Reproductive Health in Emergencies chapter. For more details about caring for AIDS orphans, refer to the Food and Nutrition chapter.

Scale up of HIV/AIDS interventions in post-disaster phase

During the post-conflict or rehabilitation phase, it is possible to expand HIV/AIDS services for displaced persons in line with national AIDS programmes. The discussion below is based on the assumption that although volunteer testing and counselling, antiretroviral treatment is currently not feasible for most post-disaster settings. It is anticipated that this might change in the near future as high drug costs and other barriers are addressed.

- **Assessment/surveillance**: Insufficient data on HIV interventions, prevalence and behaviour among refugees and displaced populations shows that governments, UN agencies and NGOs have not prioritised this area. Comprehensive multi-sector HIV assessments in the post-disaster phase are needed to direct programming and provide a baseline for monitoring and evaluating their effectiveness. Serial HIV prevalence and behavioural surveillance studies can be conducted among refugees and Internally Displaced Persons that are a sufficient sample size to enable the comparison of results according to displaced and non-displaced populations, gender and age;

- **Diagnosis**: It is not possible to confirm HIV infection without an antibody test. However, voluntary HIV testing and counselling has been considered a low priority in refugee settings, except where strict confidentiality can be maintained and the needs of HIV/AIDS patients can be met. In non-refugee disaster settings, determining the HIV status of the affected population is very often even more complicated. Large-scale testing for HIV among refugees is not recommended. In some cultures, revealing one's HIV-positive status can lead to outright rejection and even physical harm to infected individuals from all levels: the partner, family, and community. If testing also shows high HIV rates in a refugee population, the entire population might be stigmatised in the eyes of the host population. Resettlement can be more complex as countries do not wish to absorb the burden of caring for refugees who are HIV positive or have AIDS. (For a summary of the UNAIDS/WHO position on mandatory HIV testing in refugee situations, please see the appendix at the end of this chapter).

The WHO's Clinical Staging can be used to stage patients once HIV infection is confirmed with an antibody or a virological test. It is useful for determining prognosis, monitoring patients' clinical progress and prioritizing the use of preventive interventions. Apart from this, it is particularly useful for providing guidance about when to start or review an Anti-RetroViral drug therapy as well as assess clinical response to therapy in the absence of appropriate laboratory tests. (For the revised WHO's revised Clinical Staging in Adults and Adolescents see appendix at the end of this chapter).

The following table presents WHO's recommendations for initiating Highly Active Antiretroviral Therapy (HAART, subsequently referred to as ART) in adults and adolescents with confirmed HIV infection:

*Table 7-34: WHO recommendations for initiating ART
in HIV-infected adults and adolescents*

If CD4 testing is not available	If CD4 testing is available
▪ All patients with WHO stages III and IV disease; ▪ Patients with WHO stage II with TLC < 1200/mm^3.	▪ WHO stage I or II HIV disease if CD4 count < 200/mm^3; ▪ WHO stage III disease if CD4 < 350; ▪ WHO stage IV disease, irrespective of the CD4 cell count; ▪ Asymptomatic patients with CD4 <350 should be observed and CD4 count monitored regularly. If such patients have been in long term care, ART should be initiated before CD4 count falls below 200 cells / mm^3 e.g. when CD4 count is between 200 and 250 cells/mm^3.

Treatment in the early years of the pandemic, was mostly through interventions focused on the prevention of new infections by increasing public awareness and advocating for behaviour change. The majority of people already infected could only access palliative care because the cost of antiretroviral drug therapy was prohibitive. Fortunately, the last few years have seen the introduction of services that can reduce the suffering of People Living with HIV/AIDS (PLHIV). However, it cannot be over emphasised that the mainstay of managing the HIV/AIDS epidemic still relies primarily on prevention and advocacy for behaviour change:

▪ **Chemoprophylaxis during deliveries** is practiced in some countries but not everywhere. In emergencies, when seropositive mothers deliver or in areas where HIV prevalence is high, AntiRetroViral (ARV) prophylaxis should be used. Single dose Nevirapine must be administered to the mother at the onset of labour and Nevirapine syrup to the newborn immediately after delivery. Although there are other more efficacious ARV regimens for the prevention of mother-to-child transmission, the single dose Nevirapine approach is very convenient and practical for large scale implementation. The prophylaxis benefits the baby to a great extent even when breastfed afterward. Before adopting this intervention, however, it is important to consult the MoH and confirm which ARV prophylaxis is acceptable;

▪ **Highly Active Antiretroviral Therapy** (ART) has been shown to be effective in reducing morbidity and mortality in clinical and observational studies and in practice in the western world. These findings brought about an ethical challenge to increase access to treatment in developing countries. Unfortunately due to the high cost of AntiRetroViral (ARV) drugs and the required patient monitoring costs, most HIV infected individuals in the developing countries cannot access this life saving care;

The goals of Highly Active Antiretroviral Therapy (ART) are to improve the quality of life of those infected with HIV, reduce HIV related morbidity and mortality by restoring and preserving their immune function and maximally suppressing viral replication. To achieve this, a minimum three antiretroviral drugs from at least two different classes must be administered in combination bearing in mind the efficacy of the regimen as well as the tolerability, affordability and availability of the drugs. The following box illustrates the standard first line regimens for several countries in sub-Saharan Africa.

Figure 7-11: First line HAART regimen for adults and adolescents

> **Stavudine (d4T) or Zidovudine (AZT)**
> **+**
> **Lamivudine (3TC)**
> **+**
> **Nevirapine (NVP) or Efavirenz (EFV)**

Because HIV management is evolving, rapid changes in treatment and care are likely to occur. National treatment guidelines are likely to be amended or revised as a result of new evidence or changes in drug availability.

Table 7-35: Other treatment for HIV positive patients

1. Identify the presence of any existing illnesses particularly the common and serious opportunistic infections. **Screening for TB should be carried out in all patients.** This should largely be based on the history and examination; routine chest x-rays are not required in all patients.	2. HIV infection is a sexually transmitted infection, thus all HIV positive patients should be assessed for symptoms of STIs and syndromic management provided where indicated.
3. Review concomitant medications including traditional therapies, alcohol, cigarette use and non-prescribed drug use.	4. All HIV positive patients must be started on cotrimoxazole preventive therapy (unless contraindicated).
5. HIV positive patients need multivitamin supplementation particularly when nutritional requirements might not be adequately met. Multivitamins can act as potent antioxidants and reduce HIV replication, slowing disease progression.	6. Clinical evaluation of the patient should include weight, nutritional and social assessment as well as assessment of other factors that may impact on adherence.

Diseases from the animal sector and other emerging diseases

Several diseases have surfaced recently, which have become major threats in emergency and non-emergency situations. During conflicts communicable diseases can transported by displaced populations into regions where the disease is not endemic. Wherever the infectious agent is new, the affected populations will lack the immunity to defend themselves. Other factors promoting the spread of emerging diseases in stable populations include changing climatic conditions as well as human behaviour, increasing interaction among humans and animals and the development of more virulent infectious agents.

An estimated 75% of emerging diseases may be zoonotic in origin. (WHO defines zoonotic diseases as those infections and diseases that are naturally transmitted between animals and humans). Most zoonotic diseases are of viral origin and likely to be vector-borne. Diseases can spread from animals to humans due to the following:

- Expanding human settlements into wildlife habitat (e.g. rabies);
- Global trade of domestic and wild animals and exotic pets (e.g. salmonella, monkeypox);

- ▪ Consumption of exotic foods with live animal and bushmeat markets (e.g. Ebola);
- ▪ International travel e.g. Avian Flu, SARS;
- ▪ Breakdown of public health measures: e.g. *Mycobacterium bovis.*

Understanding how the spread of zoonotic diseases is promoted among humans is essential for effective prevention and control. Key control measures include improved agricultural practices, control of live animal trade and educating the public about risks of outdoor activities, ownership of exotic pets and consumption of exotic foods. A global animal disease surveillance system should be linked to the public health surveillance system. Most animal pathogens captured through existing surveillance programmes are related to farm animals, but few or no surveillance programmes are specifically aimed at wildlife. Thus the increasing threat of emerging diseases in emergency and non-emergency settings demands for stronger collaboration among the health, livestock, wildlife, agricultural, environmental and other sectors in programme planning, implementation and evaluation.

The remainder of this section will focus on zoonotic and other emerging diseases that have gained increasing prominence using the following classification:

- ▪ **Viral diseases** — viral haemorrhagic fevers (Dengue, Rift Valley fever, Ebola, yellow fever), avian influenza, SARS, hepatitis, polio;
- ▪ **Bacterial diseases** — typhoid fever, tetanus, relapsing fever and leptospirosis.
- ▪ **Parasitic and other diseases** — amoebiasis, giardiasis, hookworm, roundworms and scabies.

Viral Hemorrhagic Fevers (VHFs)

VHFs refer to a group of illnesses caused by four distinct families of RNA viruses—*arenaviruses, filoviruses, bunyaviruses* and *flaviviruses*. In general, clinical symptoms of people infected with VHF viruses often include haemorrhage (bleeding). Although some types of haemorrhagic fever viruses cause relatively mild illnesses, many of them cause severe, life-threatening diseases[4].

Rodents and arthropods, rather than humans, are the main reservoirs for VHF viruses. The multimammate rat, cotton rat, deer mouse, house mouse and other field rodents are other reservoir hosts. Arthropod ticks and mosquitoes serve as vectors for some viruses. But, the hosts for Ebola and Marburg viruses remain unknown for the moment.

Depending on the presence of their particular host species, viruses that cause VHF are distributed over much of the globe. Some VHF viruses are transmitted when humans have contact with urine, faecal matter, saliva, or other body excretions from infected rodents. Arthropod vectors often spread Viral Haemorrhagic Fever (VHF) viruses when a vector mosquito or tick bites a human or when a human crushes a tick. Some vectors can spread the virus to animals and livestock. Humans become infected when they care for or slaughter animals. Ebola, Marburg, Lassa and Crimean-Congo Haemorrhagic Fever viruses are transmitted from one person to another, once an initial person has become infected.

With a few noteworthy exceptions, there is no cure or established drug treatment for VHFs. However, careful clinical management by experienced physicians and nurses frequently saves the lives of VHF patients. The occurrence of outbreaks cannot be easily predicted. While viral haemorrhagic fevers cause relatively fewer deaths, outbreaks are increasingly common in emergency and post-emergency settings.

Effective vaccines have only been developed for yellow fever and Argentine haemorrhagic fever, Therefore prevention efforts must concentrate on avoiding contact with host species and minimizing person-to-person transmission from infected cases. For haemorrhagic fever viruses that have rodents as the main reservoirs, prevention efforts need to focus on controlling rodent population, ensure safe keeping of foods,

discouraging rodents from entering or living in homes or workplaces and encouraging the safe clean-up of rodent nests and droppings.

For VHF viruses spread by arthropod vectors, prevention efforts often focus on community-wide insect and arthropod control, promoting insect repellent and other barriers such as proper clothing, bed nets, and window screens to avoid being bitten. For those haemorrhagic fever viruses that can be transmitted from one person to another, avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease. Barrier nursing or infection control techniques include proper handling of the dead, isolating infected individuals and wearing protective clothing. Other infection control recommendations include the proper use, disinfection and disposal of instruments and equipment used in treating or caring for patients with VHF such as needles and thermometers.

The following is a brief discussion of some important VHF diseases (Rift Valley fever, Ebola haemorrhagic fever, Dengue Haemorrhagic Fever and yellow fever), describing their transmission, prevention, case management and control.

Dengue Haemorrhagic Fever (DHF)

Caused by four different viruses, Dengue Haemorrhagic Fever is a viral infection that has become a major international public health concern because the number of cases is rising sharply globally. First recognised in the 1950s, the disease has become endemic in more than 100 countries in Africa, the Americas, Asia and the Western Pacific. Transmitted by the *Aedes aegytypi* mosquito, studies have shown that in some parts of the world monkeys might serve as a source of the virus for uninfected mosquitoes. WHO estimates that there are 50 million cases of DHF infection worldwide every year and the disease is sharply increasing worldwide. During DHF epidemics, attack rates among susceptible individuals are often 40% to 50%, but might reach 80% to 90%. An estimated 500,000 cases of DHF require hospitalisation each year, of which a very large proportion are children. Without proper treatment, DHF case fatality rates can exceed 20%. With modern intensive supportive therapy, such rates can be reduced to less than 1%. [43]

Dengue fever is a severe, flu-like illness that affects infants, young children and adults, but seldom causes death. Dengue Haemorrhagic Fever (DHF) is the more serious form of disease that is characterised by high fever, haemorrhagic phenomena, often with haepatomegaly and, in severe cases, signs of circulatory failure such as hypovolemic shock. Patients can either go rapidly into a critical state of shock and die within twelve to twenty-four hours or recover quickly after appropriate volume replacement therapy.

Table 7-36: Case definition and management of Dengue Haemorrhagic Fever (DHF)

Case definition	Case management
Probable DHF: Acute febrile illness with two or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leukopenia AND supportive serology OR occurrence at same location and time as other confirmed cases of DHF **confirmed**: Case confirmed by lab criteria.	No specific treatment or vaccine is yet available.
DHF: Fever or history of fever lasting two to seven days occasionally biphasic. At least one of the following haemorrhagic features: (positive tourniquet test,1 petechia/ecchymoses/purpura, bleeding from mucosa/gastrointestinal tract/injection sites, or haematemesis/melena); thrombocytopenia, evidence of plasma leakage.	Supportive care: ▪ Volume replacement with intravenous fluids or oral rehydration solution; ▪ Antipyretics (e.g. paracetamol); ▪ Possible blood transfusion.

Source: WHO

Note: Because of variability in clinical illness, strict clinical definitions are not adopted and laboratory confirmation is emphasised.

Prevention and control of Dengue Haemorrhagic Fever (DHF)

The *Aedes aegypti* mosquito, the most important vector of the DHF virus, should be the focus of control and surveillance activities. Vector control is achieved using environmental management and chemical methods. These include proper solid waste disposal and community-based measures to improve water storage practices such as covering water containers to prevent access by egg laying female mosquitoes.

Chemical methods involve applying insecticides in larval habitats such as water storage vessels. Although preventing mosquito breeding for weeks, insecticides must be periodically re-applied. Emergency control measures, while less effective and more costly, might include space sprays to kill adult mosquitoes using portable machines. It is essential to monitor the vectors' susceptibility to chemicals in order to guide appropriate insecticide selection. Active surveillance of the natural mosquito population should complement these control efforts to assess their impact.[42] Progress is being made toward developing vaccines that can protect against all four DHF viruses. The use of insecticide treated bed nets is of little value since the *Aedes aegypti* mosquito is a day biter.

Rift Valley Fever (RVF)

RVF is an acute disease caused by the RVF virus, a member of the bunyavirus family. The virus exists in most countries in sub-Saharan Africa and Madagascar. RVF virus primarily affects a large number of domestic animals (such as cattle, buffalo, sheep, goats and camels). RVF outbreaks can cause great economic loss for livestock farmers because of the significantly higher case-fatality among infected animals and virtually 100% abortion of foetuses. The most notable outbreak of Rift Valley Fever (RVF) was in Kenya in 1950 to 1951 resulting in the death of an estimated 100,000 sheep. Humans acquire RVF through bites from infected mosquitoes or, more frequently, by exposure to blood, body fluids or tissues of animals bitten by infected mosquitoes. Direct exposure to infected animals can occur during slaughter or through veterinary and obstetric procedures.

Clinically, RVF presents with symptoms ranging from asymptomatic or mild febrile illness; less than 8% of cases develop severe haemorrhagic fever or encephalitis. The overall human mortality rate from RVF has been estimated at 0.5% to 1.0% of those infected, but the rate is much higher among those with severe disease.[53]

Individuals who work with animals in RVF-endemic areas have a high risk of being infected during RVF epidemics. These include herdsmen, veterinarians and slaughterhouse workers. Other people increase their risk of becoming infected when they consume diseased livestock or visit locations experiencing RVF epidemics. There are neither medications nor licensed vaccines for preventing RVF disease in humans. Although vaccines for veterinary use are available, they can cause birth defects and abortions in sheep and induce only low-level protection in cattle.[5]

Ebola Haemorrhagic Fever

Ebola virus, mainly found in Africa and the Western Pacific, is a febrile haemorrhagic illness that kills 50% to 90% of clinically ill cases. Transmitted through direct contact with blood, secretions, organs and other bodily fluids of infected persons, Ebola virus has an incubation of two to twenty-one days. Those handling bodies dead from Ebola and those participating in certain burial ceremonies, for example, are at risk for contracting the virus. Without using proper infection control methods, healthcare workers become especially vulnerable to acquiring the Ebola virus from infected patients. The largest Ebola epidemic struck Gulu district, northern Uganda in winter 2001. Within five months, the Ebola virus infected nearly 450 people, killing over 200 of them.[26]

Table 7-37: Clinical presentation, diagnosis and case management of ebola hemorrhagic fever

Clinical features	Diagnosis	Case management
Typical symptoms: fever, intense weakness, muscle pain, headache, sore throat;	Serum antigen detection.	No specific treatment or vaccine is yet available.
Followed by: vomiting, diarrhoea, rash, impaired kidney and liver function **Some cases**: both internal and external bleeding.	Tests on suspected samples conducted under *maximum biological containment* due to extreme biohazard risk.	Therapy is primarily supportive as patients are frequently dehydrated and in need of intravenous fluids or oral hydration therapy.

Source: WHO

Prevention and control of ebola heamorrhagic fever

Ebola haemorrhagic fevers can be contained by pursuing the following control measures.[7] Suspected cases should be isolated from other patients. Contact tracing and follow-up of those exposed to the case is essential. Hospital staff, particularly those dealing with patient body fluids or inserting intravenous lines and catheters, should implement strict barrier nursing techniques involving the use of protective clothing (e.g. goggles, gloves, gowns). Since Ebola can spread through contact with the infected patient's items including soiled bed linen, bedpans and utensils, efforts must be taken to disinfect these items before handling them. Finally, affected communities should be informed about the natural history of Ebola and containment measures including prompt and safe burial of those who die from the virus.

Yellow fever

The turnout for the vaccination campaign is seen as a great success as WHO had earlier warned that without a mass vaccination campaign up to 35,000 people could have died. As it is, just seven deaths have been reported in the city. (2001) Photo: Marko Kokic / International Federation

Yellow fever exists in two forms: the *sylvatic yellow fever* and *urban yellow fever*. Sylvatic yellow fever is restricted to the tropical regions of Africa and Latin America where 1000-1500 cases occur annually, with reported case fatality rates of 25 to 34%. Risk factors for yellow fever outbreaks include neglect of yellow fever vaccination, overpopulation, rural to urban migration and poor water supply or sewage disposal. Young adult males who work in forested or transitional areas are most affected. No cases of urban yellow fever have been reported in the Americas since 1942, except for a few cases in Trinidad in 1954. The threat of outbreaks of urban yellow fever has increased in Africa, as the *Aedes aegypti* re-infests the cities. Outbreaks have been reported in Nigeria, Kenya, Cameroon, Gabon and Ghana. In 1995, an outbreak in Liberia spread to Sierra Leone.

Other emerging diseases of viral origin

Avian flu

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. In poultry, the viruses cause two forms of disease – one common and mild, and the other rare and highly lethal referred to as "chicken Ebola" because it causes internal bleeding. Highly pathogenic avian influenza viruses can survive for long periods in bird faeces and spread from farm to farm by the movement of live birds and people (through contaminated shoes, clothing, vehicles, cages and feed). More than 24 outbreaks have been recorded among birds since 1959, primarily in Asia and some countries in Europe[39]. Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. In poultry, the viruses cause two forms of disease—one common and mild, the other rare and highly lethal. It is referred to as 'chicken Ebola' because it causes internal bleeding. Highly pathogenic avian influenza viruses can survive for long periods in bird faeces and spread from farm to farm by the movement of live birds and by people's contaminated shoes, clothing, vehicles, cages and feed. More than twenty-four outbreaks have been recorded among birds since 1959, primarily in Asia and some countries in Europe.[39]

Only four among hundreds of avian influenza virus strains are known to infect humans. The avian H5N1 strain causes very severe illness with high case fatality rate. Contact with sick or dead poultry appears to be the main source of transmission to humans rather than direct human-to-human transmission. Identified risky behaviour for disease transmission includes slaughtering, de-feathering, butchering and preparation for consumption of infected birds. The incubation period for avian influenza ranges from two to eight days which is followed by a range of clinical presentations including high fever (temperature $> 38^{o}$C), influenza-like symptoms, difficulty in breathing, hoarse voice and sputum production which are sometimes bloody. Some people develop watery diarrhoea, vomiting, abdominal and chest pains and bleeding from the nose and gums. All severely ill patients have primary viral pneumonia that which does not respond to antibiotics. Patients with H5N1 infection can develop acute respiratory distress within six days from the illness's onset.

Although rare in humans, H5N1 avian influenza is a severe disease that must be closely watched and studied. The first documented avian flu outbreak occurred in Hong Kong in 1997 with eighteen cases and six deaths. It coincided with an outbreak of a highly pathogenic avian influenza epidemic in poultry farms and live markets. The rapid slaughter of Hong Kong's entire poultry population, (about 1.5 million birds) prevented a possible avian flu pandemic. Between December 2003 and January 2006 human cases of avian flu were detected in Egypt, Sudan, Cambodia, China, Indonesia, Thailand, Turkey, Viet Nam, Iraq and others. The most severely affected country was Viet Nam, with more than ninety cases. All human cases have coincided with outbreaks of highly pathogenic H5N1 avian influenza in poultry. Over 100 people have been confirmed through laboratory testing to harbour the H5N1 strain of avian influenza and more than half of the laboratory-confirmed cases have been fatal.

Of great concern is the constant change of the genetic material and exchange of such material with other viruses. Although some of these mutations are mainly weakening the virulence, occasionally a more aggressive subtype emerges. Several of these subtypes have been identified and WHO warns that a future change of the genetic material could facilitate a human-to-human transmission similar to seasonal influenza. If this occurs, we could face a pandemic of gigantic proportions, killing up to 50 million people. This threat and, indeed, the risk for other viruses to go pandemic (like SARS), requires a high level of preparedness among all sectors of the society.

There is no vaccine available against a pandemic strain of H5N1. The problem is that the virus does not yet exist and therefore it is hard to develop an effective vaccine. Once the new strain has emerged, it takes four to six months to develop a vaccine and longer to produce it in adequate quantities. A specific problem with avian flu vaccine production is that chicken embryos are used. However, the virus rapidly kills the chicken embryo after it is inoculated into the egg. The result is that vaccine production will be slow and, practically speaking, no major immunisation campaigns can take place because there will not be enough vaccine available and time will be too short.

The recommended treatment for avian influenza, in adults and adolescents of thirteen years and older, is oseltamivir (commercially known as Tamiflu) given as 150 mg per day, (75 mg twice a day) for five days. Oseltamivir can reduce viral replication and improve patient survival if administered within forty-eight hours following the onset of symptoms. For severe cases, the recommended daily dose or the duration of treatment can be increased, but doses above 300 mg per day are associated with increased side effects. Oseltamivir is not recommended for the treatment of children younger than one year of age.

Note: Oseltamivir can be used as a prophylaxis, but is expensive and, indeed, the production of the drug cannot cope with the demand even for treatment. It is critical to note that there are now confirmed cases of Oseltamivir resistance.

Control of the larger outbreaks have been costly and difficult for the agricultural sector. The first epidemic among humans was caused by the H5N1 strain in Hong Kong in 1997. Once a fully contagious virus strain emerges, H5N1's global spread will be difficult to control as many countries can only delay the spread through travel restrictions. Because people will lack immunity to the pandemic virus and many developing countries will lack vaccines, infections and illness rates are expected to be high. A sensitive surveillance system is vital to detect the spread of emerging influenza strains.

Control measures for the highly pathogenic avian influenza include the following:

- First and foremost intensive information and awareness campaigns targeting communities as well as health and agricultural authorities at various levels;
- Information on what to do if birds are found dead for unknown reasons;
- Rapid culling (collection) of all infected or exposed birds;
- Proper disposal of carcasses;
- Quarantining and rigorous disinfection of farms;
- Strict sanitary, or "bio-security", measures;
- Restricted movement of live poultry, both within and between countries;
- Vaccination of poultry in high-risk areas with quality-assured vaccines.

The above-mentioned control measures can easily be applied to large commercial farms, where large numbers of birds are housed indoors, usually under strictly controlled sanitary conditions. Control is more difficult where poultry is raised in small backyard pens scattered throughout rural or peri-urban areas. Poverty exacerbates the problem. For households where poultry is the prime source of food and income, people frequently consume the sick and dying poultry to avoid total loss. This practice increases the risk of human exposure to the virus and has proved difficult to change. Since poultry deaths in backyard pens are common particularly under adverse weather conditions, owners might not recognise the illness in a flock as a signal of avian influenza and thus fail to alert the responsible health authorities. Moreover, lack of compensation to small scale farmers for destroyed birds also discourages the spontaneous reporting of outbreaks and can encourage owners to hide their birds during culling operations. As a result, outbreaks in some rural areas can go undetected for months.

Severe Acute Respiratory Syndrome (SARS)

SARS is a disease caused by the coronavirus (SARS-CoV), an animal virus believed to have crossed barriers to infect humans when exposure of humans to the virus was increased by human behaviour or ecological changes. The natural reservoir for SARS includes a range of animal species such as the Chinese ferret badger, raccoon dog, domestic cats and the Himalayan masked palm civet (which can be associated with direct animal-to-human transmission). SARS primarily spreads as a hospital-acquired infection among humans and the majority of the cases are adults. However, because it can be transmitted from human-to-human, there is the risk like other evolving viruses of it going pandemic like the Spanish Flu epidemic of 1918. By July 2003, human-to-human transmission of the virus resulted in 8,098 SARS cases and 774 deaths in twenty-six countries. This SARS pandemic was a wake up call that demonstrated how easily a virus can spread globally because of the extreme mobility of people. Outside the epidemic period, the most probable sources of SARS infection is exposure in research or diagnostic laboratories or from animal or environmental sources of SARS-like viruses.[51]

The Case Fatality Rate (CFR) of SARS during the 2003 epidemic in Canada, China, Hong Kong SAR, Singapore, Viet Nam and the United States was estimated to range from 0% to more than 50%, with a crude global CFR of approximately 9.6%. Two Children with SARS experience a milder illness but pregnant women can experience an increase in foetal loss in early pregnancy and maternal mortality in later pregnancy.

The mean incubation period for SARS is five days with a range of two to ten days. People with SARS are infectious from the second week after the onset of symptoms. Clinical illness begins with non-specific influenza-like symptoms such as malaise, myalgia, headache and rigours. Fever is the most frequently reported symptom, but may be absent on initial measurement. Cough, and dyspnoea often develop during the second week with severe cases developing rapidly progressing respiratory distress and oxygen desaturation. About 20% may need intensive care. Up to 70% of patients develop large volume and watery diarrhoea without blood or mucus.

Case management for SARS

The following figure presents the clinical criteria for SARS used for public health surveillance.

Figure 7-12: Clinical definition of SARS

A clinical case of SARS is an individual with:

1. A history of fever, or documented fever >= 38 °C (100.4 °F).

    AND

2. One or more symptoms of lower respiratory tract illness (cough, difficulty breathing, shortness of breath).

    AND

3. Radiographic evidence of lung infiltrates consistent with pneumonia or ARDS or autopsy findings consistent with the pathology of pneumonia or ARDS without an identifiable cause.

    AND

4. No alternative diagnosis can fully explain the illness.

(ARDS = Acute Respiratory Distress Syndrome)
Clinicians and public health professionals should be familiar with other community-acquired and hospital-acquired Acute Respiratory Infection diseases that have a similar

clinical presentation like SARS including: influenza virus, parainfluenza viruses, Respiratory Syncitial Virus, *Haemophilus influenzae, Mycoplasma pneumoniae, Chlamydia* species, *Legionella* species, and *Coxiella burnetii.*

Recommended steps for managing confirmed cases of SARS are summarised below:

- Patients must be immediately isolated and transmission-based precautions instituted, if not already in place;
- Prompt laboratory diagnosis. WHO assists in investigating SARS alerts as appropriate, including facilitating access to laboratory services;
- Contacts of persons under investigation for SARS must be traced and placed on twice daily fever monitoring until SARS has been ruled out as the cause of the illness.

All contacts should ideally be given written information on the clinical picture, transmission and other features associated with SARS as well as written information on respiratory hygiene and contact precautions.

Control of SARS

Depending on risk assessment and available resources, surveillance can be undertaken to monitor the risk of the re-emergence of SARS-like diseases in high-risk areas:

- Surveillance of occupational risk groups e.g. laboratory workers in the inter-epidemic period, health care workers during an outbreak of SARS;
- Surveillance of persons discharged from hospital with a diagnosis of unspecified atypical pneumonia during and following an outbreak of SARS;
- Surveillance for unexplained deaths following an acute respiratory illness;
- Surveys to incidence and prevalence of SARS-CoV-like virus infections among wildlife handlers, market vendors and hunters;
- Community-based surveys to monitor changes in the seroprevalence of SARS-CoV infection;
- Surveys to assess incidence and prevalence among wildlife populations thought to be the reservoir(s) of SARS-CoV transmission.

Hepatitis

Hepatitis A, B, D and E viruses are common in the tropics, but the geographic distribution of hepatitis C virus is unknown. The common clinical feature is jaundice. The most common route for spreading hepatitis A and E is faecal-oral, but transmission through food and other routes also occurs. Severe hepatitis E infection can also be acquired through consumption of undercooked deer and wild boar among hunters in Japan.[9] In endemic areas, hepatitis E illness is generally mild and self limiting. It strikes displaced populations more frequently than populations in non-emergency settings. Case fatality among pregnant women may be as high as 25%. Outbreaks of hepatitis A and E occurred in Sudan and Chad about thirty-two years ago and more recently after the 2004 tsunami in Aceh and the 2005 Pakistan earthquake. Hepatitis B, C and D viruses are transmitted sexually as well as through blood or its products. Infection with these viruses can persistent for a long time, with some people becoming carriers but transmitting the virus without developing the disease. Most people who recover from hepatitis infections develop life-long immunity.

Note that there are many other infectious diseases, where jaundice is a common feature.

The following table summarises the epidemiology of different hepatitis infections.

Table 7-38: Epidemiology of different viral hepatitis infections

	Hepatitis A	**Hepatitis B**	**Hepatitis C**	**Hepatitis D**	**Hepatitis E**
Incidence	Childhood	Young adult	Young adult	Young adult	Young adult
Incubation period	2 – 6 weeks	4 – 30 weeks	2 – 25 weeks	Co-infection B-D: consequence of hepatitis B Super-infection of carrier chronic B: about 5 weeks.	2 – 8 weeks
Infectious period	Begins before signs appear. Brief: <10 days after onset of jaundice. Maximal at the end of the incubation period.	Begins before signs appear, Lasts the whole active period, Can persist in chronic carriers.	Begins before signs appear, Duration poorly understood, can resemble HBV infection or persist for longer periods.	Begins before signs appear Duration poorly understood. Can resemble HBV infection.	Begins before signs appear, Duration poorly understood (10-15 days after onset of jaundice).
Transmis-sion	Faecal-oral, Contaminated water and food, Rarely transfusion.	Blood and its derivatives, Sexual, Contaminated blood products, Vertical (mother to neonates).	Blood and its derivatives, Sexual: weak, Contaminated blood products: weak, Probably vertical.	Blood and its derivatives, Sexual (especially homosexual), Contaminated blood products, Vertical possible.	Faecal-oral, Contaminated water and food.
Incidence	Childhood	Young adult	Young adult	Young adult	Young adult
Long-term prognosis	No chronic forms	0.2–10% become chronic, of which 5 – 15% develop cirrhosis. Hepatoma possible	Up to 50 % become chronic of which 10–25% develop cirrhosis. Hepatoma possible	2-5% of B-D co-infections and >90% super-infections in HBV carriers become chronic (rapidly develop cirrhosis).	No chronic forms
Personal Prevention	Non-specific immunoglobulin injections.	Specific immunoglobulins anti HBS. Safe sex (condoms).	Anti HBS immunoglobulins can be effective.	Same as for HBV (HDV infection can only develop with HBV).	Specific immunoglobulins for pregnant women.
Vaccina-tion*	Anti-hepatitis A	Anti-hepatitis B	Non existent	Anti-hepatitis B	Non-existent

* Combined Hepatitis A and B vaccine is available Source: MSF – Clinical Guidelines

Clinical features and management of hepatitis

All hepatitis viruses can cause acute hepatitis summarised in the following table:

Table 7-39: Clinical symptoms of hepatitis

Diagnosis	Clinical signs and symptoms
Acute hepatitis	Nausea, fever, fatigue, abdominal discomfort, followed by jaundice, dark urine and stools more or less pale.
Sub-clinical infection	Mild or anicteric (non-jaundice) infection.
Fulminant Hepatitis	Severe acute infection that leads to necrosis and liver failure. Associated with high mortality.
Chronic active hepatitis	Can lead to cirrhosis and eventually primary liver cell cancer.

Case management

There is no specific treatment for viral hepatitis and some individuals recover naturally. The following measures may relieve symptoms of hepatitis:

- Symptomatic: rest, diet, rehydration, tranquillisers, caution in use of analgesics (e.g., acetyl salicyclic acid, paracetamol), etc.;
- Avoid corticosteroid therapy and other medications that are metabolised by the liver.

Control of hepatitis

The following measures may be used to control outbreaks of hepatitis:

- Chlorinating water for the entire population;
- Promoting personal and food hygiene (particularly among pregnant women to protect them against Hepatitis E infections);
- Proper screening of blood prior to transfusion, which should be restricted to life-threatening emergencies. Transfusion materials should be disposed of properly.

Poliomyelitis

While poliomyelitis (polio) cases have decreased by over 99% since 1988, remaining cases have been reported in many countries where emergencies exist or have recently occurred. These nations include Somalia, Indonesia, Afghanistan and Sudan.[14] Polio is an acute viral infection caused by several infectious strains and passed through faecal-oral transmission. It can quickly lead to paralytic disease and case fatality rates are as high as 10% in epidemics.[47] Risk factors for polio outbreaks during emergencies include overcrowding of non-immune groups and collapse of sanitation structures.[16]

Control of poliomyelitis

The WHO definition of polio is:

Any child under five years of age with acute flaccid paralysis, for which no other cause can be identified.

In routine surveillance in the emergency phase, polio is usually not included. However, any case of acute flaccid paralysis can be considered as the start of a polio outbreak.[21] An outbreak investigation must be immediately begun and efforts must be made for early detection of paralytic cases. An effective way of rapidly controlling an outbreak is to launch a mass vaccination with Oral Polio Vaccine (OPV).[3] All children should receive at least one dose of OPV. Ideally, these activities should begin within two and end within

seven days of initial outbreak investigation. After thirty days, a second round of mass vaccination should be carried out.

Table 7-40: Case management of polio

Polio case management	
Acute stage	▪ Disinfection measures particularly against stools)
	▪ Rest and supportive treatment
After acute stage	▪ Physical therapy

Bacterial diseases

Typhoid fever

This disease is caused by the bacteria Salmonella typhi. Most large outbreaks are water-borne while smaller ones are food-borne. The disease primarily affects the lymph nodes of the small intestine. Common symptoms of typhoid include fever, headache, abdominal cramping and constipation. Not everyone infected with typhoid will develop diarrhoea. Those who experience diarrhoea, will report stools that have a pea soup appearance. Intestinal perforation is a much feared complication of typhoid. While most infected people stop passing the bacteria in their stool shortly after regaining their health, about 10% of them will continue shedding for three months after the onset of symptoms. Infected food handlers present the primary hazard in the spread of disease. Typhoid fever is mainly a clinical diagnose since specific tests turn positive only during the illness and after.

Typhoid case management

Patients with acute typhoid illness will present with non-specific symptoms and are not easy to diagnose. Laboratory tests can prove positive later; it is important, therefore, to remain highly suspicious and make a clinical diagnosis. Suspected cases should be carefully observed in a hospital for early detection of severe complications such as abdominal bleeding or intestinal perforation. They often require two weeks of antimicrobial treatment and supportive care as summarised in the table below:

Table 7-41: Typhoid fever case management

Typhoid fever case management	
Specific treatment	First choice:
	▪ Chloramphenicol, high dose, injectable for a start
	Second choice:
	▪ Ampicillin or Amoxycillin
	▪ Sulphamethoxazole/Trimethoprim
Supportive treatment	▪ Rehydration
	▪ Treat fever
	▪ Corticosteroids for critically ill patients

Control of typhoid

The following measures may control outbreaks of typhoid:

- Chlorinating the water supply is the best assurance against a massive typhoid outbreak;
- Promoting food hygiene should focus on hand washing among food handlers and checking that anyone who has ever been sick does not prepare food for others. However, identifying food vendors with typhoid fever and restricting them from work until they are not contagious can be impossible in emergency situations.

Note: WHO does not recommend vaccination as it offers only low, short- term individual protection and little or no protection against the spread of the disease[37].

Note: Injectable vaccine is far less effective than the new oral vaccine. However, the protection period is about the same.

Tetanus

With its causative agent *Clostridium tetani* found universally in the soil, tetanus occurs worldwide. The disease occurs when a powerful neurotoxin produced by the bacteria forms in dead tissues, such as umbilical cords and dirty wounds. Common signs of tetanus include hypersensitivity to light and sound, stiffness and convulsions. Risk factors for transmission of tetanus include traditional practices (e.g. home deliveries and circumcisions) carried out under poor hygiene conditions, rapid-onset disasters associated with blunt trauma (e.g. earthquakes, tsunami and conflicts) and interruption of immunisation services.[21] Up to 72% of all neonatal deaths are caused by neonatal tetanus with an underestimated 300,000 cases reported worldwide in 2004.[34] Case-fatality rates for wound-related tetanus can be as high as 35% to 70% where populations have low vaccination coverage. Tetanus outbreaks often occur about two weeks after a disaster as in the earthquake in Pakistan and Yogyarkata. After the 2005 tsunami in Aceh, 106 cases and twenty deaths from wound tetanus were reported. It is usually connected with open and poorly cleaned wounds and injuries that are prematurely sutured despite the fact that they are not clean Open wounds should be frequently cleaned and treated for at least four days before closing.

Control of neonatal and wound-related tetanus

Cleaning the umbilical cord properly is vital for control of neonatal tetanus. The control of wound-related tetanus can be achieved by combining two key strategies. In the emergency phase, all women of childbearing age should be immunised and traditional birth attendants should be trained in clean delivery techniques.16 In the post-emergency phase, a comprehensive immunisation programme should be imple-mented in line with Expanded Programme of Immunisation recommendations including the administration of tetanus toxoid (TT) or tetanus-diphtheria (Td) vaccine in at least two doses for all children who have not been previously immunised. Late diagnosis, poor initial care and treatment and late referrals all contribute to unnecessary tetanus deaths. Antibiotic treatment, TT and anti-tetanus sera, sedation and access to ventilators can save many lives if used properly and treatment started early enough.

Case management for neonatal tetanus

The WHO definition of neonatal tetanus is:

A child with neonatal tetanus must have all three of the following: [12]

- Normal suck and cry for the first two days of life;
- Onset of illness between three and twenty-eight days of life;
- Inability to suck, followed by stiffness and/or convulsions.

Table 7-42: Case management of tetanus

Tetanus case management	
Neonatal tetanus	▪ Disinfection of umbilical cord ▪ Sedation ▪ Anti-tetanus serum and antibiotics ▪ Breast-milk through naso-gastric tube
Wound-related tetanus	▪ Adequate wound disinfection and debridement ▪ Sedation ▪ Anti-tetanus serum and antibiotics

Leptospirosis

This bacterial disease is primarily spread by direct contact with water, damp soil or vegetation contaminated by rodent urine. Flooding facilitates outbreaks of leptospirosis due to the increased proximity of rats with humans on shared high ground.

Relapsing fever

Caused by *Borrelia recurrentis,* epidemic relapsing fever is often transmitted by lice, and lasts two to three weeks.[40] Louse-Borne Relapsing Fever (LBRF) should be suspected in any patient with high fever and at least two of the following symptoms: severe joint pain, chills, jaundice or nose and other bleeding. LBRF should also be considered in cases in which fever responds poorly to anti-malarial drugs. LBRF results in higher case-fatality rates (10% to 70% without treatment) and has occurred in epidemic patterns in India, Africa and South America.[22] Populations living in extreme poverty and displaced populations are more prone to LBRF than tick-borne relapsing fever because lice infestation frequently occurs where hygiene is poor and overcrowding occurs. This discussion will, therefore, focus on LBRF.

Immediate action must be taken when LBRF epidemics emerge because of their high case-fatality rate. Prevention measures include person hygiene and delousing campaigns with insecticide treatment. Control measures aim to reduce lice density and provide protection against further infestation. Vector control can be accomplished through house-to-house assessment for lice, followed by treating clothing with insecticide powder and house sprays. The preferred case management is a single dose of tetracycline or doxycycline (500mg). Procaine penicillin, a slower acting treatment associated with more frequent relapses, can be considered as an alternative treatment.[21]

Parasitic and other diseases

The table below summarises the transmission, clinical features, preventive and therapeutic interventions for various parasitic diseases.

Table 7-43: Overview of common parasitic infections

Parasite	Transmission	Clinical features	Prevention	Treatment
Amoebiasis ▪ Entamoeba hystolitica	**Direct***: person to person spread via dirty hands.* **Indirect**: contaminated water or food.	Amoebic dysentery Amoebic liver abscess (fever, large tender liver)*	**Personal**: hand washing, cut fingernails, boil water Wash hands after toilet visits and before eating **Community**: hygiene, sanitation, safe water supply, education.	Metronidazole + rehydration
Giardia lamblia	**Direct***: person to person spread via dirty hands.* **Indirect***:* contaminated water or food.	Diarrhoea, cramps malabsorption Motile forms seen in stools.	**Personal**: hand washing, cut fingernails, boil water. Wash hands after toilet visits and before eating. **Community***:* hygiene, sanitation, clean water supply, h/ education.	Metronidazole
Trichomonas vaginalis	Sexual	Females: Vaginitis. Males: usually no symptoms, or urethritis.	Treat all sexual contacts (even if asymptomatic)	Metronidazole
Roundworms (Ascais lumbricoides).	**Faeco-oral**: ingesting eggs via dirty hands.	Few, if any, Gastro Intestinal Tract (GIT) symptoms, eggs in stool.	**Personal***:* hand washing, cut fingernails Wash hands after toilet visits and before eating **Community**: health education, hygiene, sanitation, enough clean water	Albendazole, Mebendazole, (or Piperazine, Pyrantel palmoate)
Hookworm ▪ N. americanus ▪ A. duodenale	**Transcutaneous***:* bare feet in contact with moist soil contaminated with larva.	Epigastric pain, anaemia, eggs in stool.	**Personal***:* wear shoes **Community***:* sanitation, hygiene, safe water supply, h/ education, mass chemotherapy.	Albendazole, Mebendazole (or Pyrantel Palmoate, Levamisole).
Schistosomiasis ▪ S. hematobium (Tropical/N Africa).	**Transcutaneous** during contact with water contaminated with Bulinus cercariae	Dysuria, haematuria, Late: hydronephrosis Eggs in urine.	Avoid swimming, vector control (snail) h/ education, mass chemotherapy. Proper water storage.	Praziquatel (or Metrifonate).
▪ S. mansoni (Tropical Africa). S. intercalatum (Central and West Africa).	**Transcutaneous** contact with water contaminated with cercariae. Bilomphalaria SPP.	Diarrhoea, cramps Late: portal hypertension Eggs in stools	As above	Praziquantel (or Oxamniquine).

* *Motile forms* (not cysts) must be present in fresh stools to diagnose amoebic dysentery.
Adjusted after Médecins Sans Frontières – Clinical guidelines.

Scabies

Transmitted by the microscopic mite, *Scaroptes scabei*, scabies causes a pimple-like rash most commonly found on the hands, skin folds of the wrist, elbow or knee, the penis, breast or shoulder. Infected individuals itch intensely all over the body, especially at night. Such severe scratching can lead to sores which may become infected by bacteria. The rash is an allergic reaction to the mite and typically lasts four to six weeks from when a person is first infected. It spreads through direct skin-to-skin contact and contact with infested garments. Epidemics have been linked to conditions that tend to prevail in emergency settings such as overcrowding, poverty and poor water-supply and sanitation. Treatment involves hot, soapy baths followed by application of acarcide ointment. Recent studies show that an oral dose of ivermectin is very effective for curing scabies. Prevention and control efforts include improvement of personal hygiene, sterilisation of infested clothing and dusting bed linens with acarcides.

Monitoring, evaluation and operations research for disease control programmes

Understanding monitoring, evaluation and operations research

Emergencies are unstable and dynamic situations. Simply carrying out comprehensive disease control measures after an initial assessment does not mean that communicable diseases will not cause problems among a displaced population. Regularly reviewing the incidence of communicable diseases as well as the effectiveness of disease control measures will determine whether selected control measures are appropriate and whether resources are adequate for preventing disease and preserving the health of the affected population.

Although much confusion surrounds monitoring and evaluation there are clear distinctions in their overall purpose and function. **Monitoring** is the *continuous* tracking of *ongoing activities* in order to assess how well a programme is being implemented, to detect any changes from the plan and take corrective action. On the other hand, **evaluation** is the *periodic* assessment of programme *results* to determine if the goals and objectives have been achieved and to identify key lessons for future improvement. Monitoring and Evaluation (M&E) has become a critical management tool for implementing agencies and an important source of information on performance for the public and donors. It helps to determine which interventions are effective and can be scaled up, and which ones need stopping or change of approach.

M&E for emergency programmes vary according to the existing disease burden. Yet some key elements can be similar for most M&E systems. The **input-process-output-outcome-impact** framework is often used for monitoring progress and evaluating results of disease control efforts. For a programme or project to achieve its goals, *inputs* such as money, supplies, facilities and staff time are expected to produce *outputs* such as cases treated for malaria, condom distribution or cases diagnosed with TB after undergoing certain *processes* such as training or procurement of drugs or laboratory testing. This may result in short-term effects or *outcomes* such as patient compliance to anti-malarial treatment or positive behaviour change. The expected long-term *impact* may be reduced malaria transmission, TB-related morbidity or improved quality of life for the HIV-infected. Classification of indicators may vary, e.g. output indicators such as knowledge may be presented as intermediate outcome indicators.

Operations research differs from M&E because it answers *specific* questions in an *experimental* or *systematic* way rather than routinely. It can be a part of M&E or a project

development whereby M&E data feeds into or generates questions for operational research. Depending on the problem, different types of operations research can be organised within a project or disease control programme to provide timely and accessible answers on technical interventions as well as programmatic questions such as cost-effectiveness and efficiency. Because operations research findings can serve as an important advocacy tool to improve functioning and strategy development, wide dissemination in an unbiased way (for example, scientific publications) is essential to policy makers, programme managers and other stakeholders. It is important to note that good quality and highly informative operational research need not be costly as it can be integrated into normal programme operations.

Table 7-44: Distinguishing between monitoring, evaluation and operations research

	Monitoring	**Evaluation**	**Operations research**
Why	To ensure a programme is being implemented according to plan, to identify problems and revise plans and approaches when necessary.	To determine if planned strategies and activities have produced the expected results	To inform and improve disease control methods and tools, and their application in order to improve impact of interventions.
What	Routine tracking of ongoing inputs, processes and outputs activities to check whether: i) What was planned has been carried out; ii) If it was carried out on time. Ensures accountability and detects problems/constraints in order to provide feedback to concerned authorities.	Episodic assessment of which outcomes and impact have been achieved and whether they are results of the programme interventions. Used for determining the value or worth of a specific programme.	Application of experimental or systematic methods to answer *specific operational questions* in order to improve function or strategy of projects or control efforts. Starts from position of uncertainty or limited knowledge gradually resulting in learning by doing; studies may compare more than one approach. Not to be used for experimenting on vulnerable population groups.
When	Ongoing, continuous.	Periodic, intermittent. Timing depends on type of evaluation and interval to produce expected changes.	When critical evidence is needed for timely decision-making on a new or existing programme or services for a particular emergency situation.
How	Routine record keeping e.g. disease surveillance, health information system, health facility reports, supervision visits.	Qualitative and quantitative research: FGDs, household surveys, health facility assessments, interviews.	Applied or health systems research using case-control or cohort study, experimental studies, KAP studies, exit interviews
Cost	Cheap since covered by normal programme costs. Logistical support critical to assure timely submission of monthly and quarterly reports and feedback.	More difficult and costly to perform due to methodology and consequences of wrong conclusion.	Can be covered within normal programme costs. Cohort studies not appropriate for emergencies as they require more time and resources.
Who	Internal, preferably at point of data collection by trained frontline workers.	Traditionally by external evaluators.	Planned and conducted in collaboration with local health authorities, implementing agencies, beneficiary community and possibly research specialists

How to establish a post-emergency or post-conflict monitoring and evaluation system

All implementing partners need to assess input, process and output data. Many programmes measure output and outcome indicators for short- to medium-term reporting. However, only a few perform impact assessments because they are more difficult and more costly. The number of stakeholders collecting or consuming data for specific indicators, therefore, declines as one advances from inputs to impacts.

During an acute emergency operation, no more than ten indicators are needed for M&E of initial health interventions. No one has the time or resources to establish a comprehensive M&E system. The critical indicators at the initial stage are those for tracking morbidity and mortality from the big killers e.g. measles, malaria, malnutrition and pregnancy related causes. As the situation starts to stabilise however, more indicators can be gradually introduced in a staggered manner to address the expanding post-emergency interventions (e.g. TB treatment, HIV prophylaxis) and, finally, achieve a health information system and monitoring system that are comprehensive.

Below is a summary of how to set up M&E in the post-emergency phase:

Establishing an M&E unit

- Appoint a special entity within the MoH with trained staff to coordinate M&E efforts;
- Allocate enough funding for M&E, ranging between 5-10% of overall budget and not fully dependant on external sources;
- Establish links with other line ministries, NGOs, research institutions and donors;
- Ensure ready access to technical expertise such as in epidemiology, behavioural or social science, financial or resource tracking, data processing and statistics.

Developing an M&E system

- Define clear goals and targets, an overall M&E framework and annual M&E operational plan;
- Define a set of priority indicators and additional indicators at different M&E levels (health indicators disaggregated by age, sex and socio-economic status where suitable);
- Select a few key indicators that are comparable with other countries or regions;
- Develop guidelines and provide guidance on M&E to provinces and districts;
- Organise periodic reviews on M&E implementation. M&E frameworks need revising every three to five years and operational plans annually;
- Coordinate all national and donor M&E efforts.

Data recording and reporting

- Develop an overall data collection and analysis plan with data quality assurance;
- Organise second generation surveillance to link behavioural data with HIV/STI biological surveillance data;
- Develop an overall data dissemination plan at national level;
- Establish a mechanism for generation and dissemination of findings;
- Compile annual and semi-annual M&E reports for wide dissemination;
- Organise annual meetings to disseminate and discuss M&E and research findings with policy makers, planners and implementers;
- Install a centralised database or library of all disease control M&E including operations research;
- Coordinate dissemination of national and donor M&E.

Indicators for malaria, TB and HIV/AIDS programmes

The ultimate goal of a disease control programme is to reduce the burden of disease. Morbidity, mortality and economic impact, therefore, are critical indicators to evaluate. All interventions will be aimed at disease prevention, outbreak control or case management. The following criteria are important when selecting other core indicators for monitoring progress and evaluating outcomes of disease control efforts:

- Relevance to programme objectives;
- Reliability across applications or time;
- Availability and timeliness of information during implementation and monitoring phases;
- Data collection limited to a few core indicators on critical areas;
- Local feedback mechanisms in place to the providers of the information at all levels;
- Broad consensus among multi-disciplinary team of stakeholders of disease control on selected M&E approaches and indicators.

The following tables list core indicators for malaria, TB and HIV/AIDS control by Roll Back Malaria, Stop TB and UNAIDS. Each sub-region or programmes can select only those indicators that appear important for the local epidemiological pattern, health infrastructure and intervention strategy. At least two indicators (one process and one outcome) must be selected under each critical area in the M&E framework. Important indicators for global reporting are highlighted in bold font.

Table 7-45: Core indicators for malaria

Malaria core indicators	
Impact	- Crude death rate (CDR). - Malaria death rate (MDR) – (probable and confirmed) among children aged 0-59 months. % of probable and confirmed malaria deaths among cases of severe malaria. - No. of cases of severe malaria (probable and confirmed) among target group. - No. of cases of uncomplicated malaria (probable and confirmed) among target group. - Annual Parasite Incidence (API) among target population (according to epidemiological setting)*.
Malaria prevention and disease management	% of countries having introduced pyrethroids for public health use and ITMs in the list of essential drugs and materials. % of service providers trained in techniques of treatment of nets and/or indoor spraying according to the national policy. % of households having at least one treated net. % of pregnant women who have taken intermittent drug treatment according to national policy. % of antenatal clinic staff trained in preventive anti-malarial treatment for pregnant women.
Control	% of countries with epidemic prone areas/situation having a national preparedness plan of action for early detection and control of epidemics. % of malaria epidemics detected within 2 weeks of onset and properly controlled.

Diagnosis and treatment	▪ % of patients with uncomplicated malaria getting correct treatment at health facility and community levels according to national guidelines within 24 hours of onset of symptoms.
	▪ % of patients hospitalised with diagnosis of severe malaria and receiving correct anti-malarial and supportive treatment according to national guidelines.
	▪ % of health facilities able to confirm malaria diagnosis according to national policy (microscopy, rapid test, etc.).
	▪ % of health personnel involved in patient care trained in malaria case management and IMCI.
Health systems strengthening	▪ % of districts with plans of action reflecting national health policy.
	▪ % of districts using health information for planning.
	▪ % of health facilities reporting no disruption of stock of anti-malarial drugs, as specified in the national drug policy, for more than one week, during the previous 3 months.
	▪ % of villages with at least one CHW trained in management of fever and recognition of febrile illness.
	▪ % of mothers of caretakers able to recognise signs and symptoms of danger of a febrile disease in a child < 5 years.
Inter-sector linkages	▪ No. of multicultural and interagency partnerships established.
Support/ Partnerships	▪ % of countries with functional sentinel sites for surveillance efficacy of 1st and 2nd line anti-malarial drugs.

* API–defined as the number of microscopically confirmed malaria cases detected during one year per unit of population by age, sex and parasite species as gathered via routine surveillance. This indicator is recommended for Papua New Guinea and countries outside Sub-Saharan Africa where countries may have high caseloads but few malaria deaths e.g. predominantly P. vivax areas.

Table 7-46: Core indicators for tuberculosis

TB core indicators	
Outcome	▪ TB death rate (% of TB cases registered in a specified period that died during treatment, irrespective of the cause).
	▪ Case notification rate (No. of all TB cases reported/year/100,000 population).
	▪ New smear positive TB cases detected under DOTS.
Treatment	▪ % of new smear-positive pulmonary TB cases registered in a specified period that completed treatment.
	▪ % of TB cases that were registered in a specific period and were cured.
	▪ % of new smear positive pulmonary TB patients that are successfully treated.
	▪ % of new smear positive cases registered under DOTS that fail treatment.
	▪ % of positive TB cases registered under DOTS who smear convert at the end of initial phase of treatment.

| Supportive Environment | DOTS coverage (Percentage of population living in districts with health facilities implementing DOTS). % of TB treatment facilities with at least one health care provider trained in TB case detection and treatment based on the DOTS strategy. % of health facilities involved in DOTS with sufficient drug supplies. TB microscopy coverage (Percentage of laboratories at health facilities performing sputum smear microscopy). |
| TB/HIV | HIV seroprevalence among all TB patients. % of health facilities where TB and HIV services are both available. |

Table 7-47: Core indicators for HIV

HIV core indicators	
Impact	- HIV prevalence. - HIV and syphilis prevalence among antenatal women.
Prevention	- No. of HIV prevention staff trained. - No. of HIV prevention meetings held. - No. of condoms sold/distributed. - No. of HIV/AIDS prevention brochures/booklets developed and distributed. - No. of radio/television programmes produced. - No. of men/women reached. % of respondents who both correctly identify ways of preventing sexual transmission of HIV and reject major misconceptions about HIV transmission and prevention. - Age a sexual debut. % of youth reporting unprotected sexual intercourse. - No. of men/women receiving care for sexually transmitted infections from health facilities with trained staff and uninterrupted supply of drugs.
Care	% of health facilities providing HIV/AIDS care appropriate for level of facility. - No. of care staff trained. - No. and % of men/women receiving HIV counselling and testing. - No. and % of women testing and receiving PMTCT if HIV-positive. - No. of community HIV/AIDS care projects. - No. of community orphan support projects. - No. of PLHIV support groups. - No. of men/women enrolled. - No. and % of orphan boys/girls enrolled.
Public sector services	- No. and % of districts with HIV/AIDS work plans and budgets. - No. of line ministries with HIV/AIDS work plans and budgets for employees. - No. and % of primary/secondary/tertiary education institutions with HIV/AIDS programmes for their students. - No. and % of districts with functioning social welfare departments providing grants to orphans and other vulnerable children. - No. of civil society partners introduced to HIV/AIDS programming.

Information on the TB control programme is often gathered through a TB suspects register, a laboratory register, the individual patient's record and central TB register. Good record keeping allows for evaluation of TB programme in three stages:

- Case finding (expected case detection of 70% for new, relapse and extra-pulmonary cases);
- Early treatment result (expected smear conversion to be 80% or more by 2-3 months); and
- Cohort analysis for treatment outcome twelve to fifteen months after registration (includes total number of pulmonary smear positive cases (divided into new and relapses), pulmonary smear negative and extra-pulmonary cases diagnosed and registered during a specific quarter.

If TB control efforts are not achieving the desired outcomes, it should be reviewed immediately and corrective measures applied as suggested in the table below:

Table 7-48: Corrective measures for TB control efforts not achieving desired outcomes

Problem of too many	If probable cause is	Possible solution(s)
Deaths	High prevalence of HIV.	Multiple interventions to minimise HIV transmission.
	TB was diagnosed late.	Make sure health workers properly assess symptoms in TB suspects and send sputum for examination. ID any impediments to access to health facilities, and correct them.
Failures	Trading in drugs and materials	Investigate thoroughly and take appropriate action.
	Poor quality medications possibly being used.	Review tendering and procurement procedures.
	Low smear conversion rate at 2 (3) months.	Make sure that there is 100% supervision of dose administration.
	Patients do not take all the medication	
Failures	Primary resistance to both Rifampicin and Isoniazid.	Devise local protocol–initiate all previously treated patients (irrespective of duration of previous treatment) on Category II treatment
	Inappropriate regimen for the specific situation, e.g. Re-treatment patients given a regimen for new patients.	Improve supervision of the health facility
Defaulters	Prescription of an inappropriate regimen for smear-positive patients previously treated with anti-TB medications.	Ask the clinic supervisor to make sure staff knows which regimen to prescribe to each type of patient according to the NTP. Check the regimen prescribed in the register and on the TB treatment card. Are medications being traded?

	If probable cause is	Possible solution(s)
	Patients were not given proper health education	Make sure that proper health education is provided to patients on a continuous basis and in a way that they can understand it
		Help authorities to understand the importance of the diagnosis of TB
	Patients were not given proper health education. Unfriendly behaviour of the health staff.	Pay attention to staff morale and enhance training.
	Slow delivery of drugs at health unit	
	Non-compliers and defaulters were not followed-up.	Ensure health workers understand the importance of tracing patients. Arrange tracing of patients who disappear especially those who are smear positive.
	Patients released and not followed-up, or not transferred correctly.	Increase supervision. Review arrangements between NTP and community health services.
Transferred out	Patients who were erroneously considered "transferred out" when they had the intensive phase and the continuation phase treated in different districts.	Patients to be registered at place where they are receiving treatment. In well established programmes or area TB coordinator should trace patients who transfer/move to the region and find out their treatment outcomes.

Setting up operations research

The same approach for setting up a disease control programme can be used for operational research. First, define the overall objectives, targets and expected outcomes of the operational research, then the key activities can be scheduled within the set timeframe and budget. Finally, a system for monitoring progress and evaluating the outcomes can be established. The table below defines critical areas to be addressed in an operations research protocol, with practical examples.

Table 7-49: Steps for operational research planning

Key step	Description	Example
Statement definition	Review existing situation through analysis of M&E data to identify key problem.	Can the private sector be induced to sell LLINs at affordable prices, and how will the system be developed, monitored and regulated?
Objectives	Define expected outcome(s) of study after wide literature review to identify what has worked locally and globally and to prevent duplication.	▪ Designing a marketing / advertising campaign; ▪ Assessing the range of market prices; ▪ Assessing the willingness of private sector to participate in the project. Expect that LLINs uptake by traders will be high and marketing campaigns to be successful. ITN coverage will increase as a result of this project with subsequent decrease in malaria incidence. Likely that a "free market" strategy will allow greater distribution but not to those in lowest socio-economic groups. Sustainability likely to be an issue.

Key step	Description	Example
Methodology	Identify what information will be needed to prove hypotheses and produce study outcomes; Define specific questions and determine how the information can be gathered; Sample size and random sampling based on statistical significance; questionnaire layout and coding; statistical package and analysis plan; pilot test.	▪ Knowledge attitudes and practices (KAP) survey of public and traders; ▪ Advertising campaign for LLINs; ▪ Market monitoring of LLINs sales.
Ethical considerations	Any research protocol involving people must pass formal review by ethical committee(s) in terms of justification for the study, potential benefits to the study population, informed consent tool.	LLINs study approved by ethical committees for research institution as well as MoH for host country.
Work plan	Identify personnel and draft a schedule for the pilot test, training, data collection, processing, analysis and dissemination; Involve future beneficiaries in planning and execution of research study.	KAP survey and advertising campaign conducted. However, due to slow international procurement process, LLINs arrived after malaria season, and ITN sales study postponed to next malaria season.
Monitoring and evaluation	Verify completeness and accuracy of data collected. Quality control checks on laboratory tests are vital for applied research or surveillance surveys.	Close supervision of data collectors; random, blind re-examination of malaria slides; double-entry of all questionnaires to confirm accuracy of electronic data.
Budget	Define specific resource needs and estimate costs for personnel, equipment, materials, technical, administrative and logistical support.	
Reporting	Plan how study results will be used and disseminated.	

8

Water, sanitation and hygiene in emergencies

Photo: International Federation

Description

This chapter discusses the importance of improving water, sanitation, vector control and hygiene in emergency settings.

Learning objectives

- To explain the relationship between the environment and water, sanitation and hygiene related diseases;
- To present standards and key indicators related water supply, sanitation and hygiene in emergencies;
- To provide basic information about control measures for improving environmental conditions;
- To discuss the importance of addressing long term needs of the community at the on-set of the emergency and throughout its duration.

Key Competencies

- To identify problems in the environment, water, sanitation and hygiene situation during an emergencies;
- To apply standards to water supply, sanitation and hygiene in emergencies;
- To install control measures for environmental health problems;
- To understand the long-term problems.

Introduction

The United Nations has declared that access to safe water and sanitation is a human right that applies in times of peace and in emergencies. In emergency settings, people often leave their homes in search of safer surroundings. In many instances, the water, sanitation and hygiene conditions of new surroundings might not be adequate. In other instances, people might be left in their home surroundings but with destroyed or damaged societal and physical infrastructure including water, sanitation and health care systems.

People affected by emergencies often suffer from malnourishment, stress, fatigue and other ailments including injuries. These conditions, coupled with unsanitary living conditions such as substandard sanitation, inadequate water supplies and poor hygiene, make disaster-affected people especially vulnerable to disease. This chapter discusses the importance of improving water, sanitation and hygiene in emergency settings.

Few emergencies leave people displaced for only a short time. Most emergencies last years. Decisions made early in the emergency, therefore, often have long-term consequences. Since emergencies often result in years of displacement, this chapter focuses primarily on environmental improvements that address the longer-term needs of disaster-affected populations. This chapter also explores how these longer-term needs can be integrated into the immediate response to an emergency. In this chapter, *water* means water for domestic purposes and not agricultural or industrial purposes. The term *sanitation* is used in a broad sense and considers excreta disposal, vector control, solid and medical waste management and drainage. The term

hygiene includes practices related to water hygiene (e.g. keeping water supplies safe), personal hygiene (e.g. washing hands), domestic hygiene (e.g. food hygiene) and environmental hygiene (e.g. keeping household environments free of excreta and solid waste).

Survival and longer terms needs in an emergency

In the first days and weeks of an emergency, immediate measures to protect human life and health must be started quickly. It is critical to meet survival needs as quickly as possible. Once met, longer-term interventions aimed at addressing the needs of the population over months and possibly years must be addressed.

Box 8-1: Acute emergency phase

At the onset of an emergency, the aim is to protect life and health through rapid assistance that focuses on the following most crucial aspects of environmental health:[1]

- Provide facilities for people to excrete safely and hygienically;

- Protect water supplies from contamination;

- Provide enough safe water for drinking, cooking and essential personal and domestic hygiene;

- Ensure that people have enough water containers to collect and store water cleanly;

- Ensure that people have the knowledge and understanding they need to avoid disease;

- Ensure that people have soap for washing their hands.

Box 8-2: Involving disaster-affect people early

As early as possible in the emergency, it is critical to:
- Consult with the disaster-affected population to get a good understanding of their needs;
- Identify key community leaders who can help organise the community's involvement in water, sanitation and hygiene projects;
- Begin planning for and start implementing longer-term interventions in consultation and cooperation with the community.

Vulnerable groups

Vulnerable groups are those individuals at greatest risk of disease or injury. There are many reasons why individuals or groups are vulnerable. Some might be vulnerable because they are given less priority for limited resources, or belong to an ethnic, social, religious or political minority or have greater difficulty accessing treatment and care. There is a strong correlation between poverty and vulnerability. Vulnerable groups can include women, children, older people, physically and mentally disabled people, people living with HIV/AIDS, infants and children who are already weak and sick. Those living in child-headed households are also frequently at higher risk for disease or injury. People who are either separated from or without access to the main focus of relief assistance are also vulnerable. In some situations, refugees or displaced people might be scattered among the host community. These individuals are particularly vulnerable because they might not receive the same assistance as those who are living in camps in settlements.

Diseases related to water, sanitation and hygiene

This chapter focuses on diseases related to water, sanitation and hygiene. Unlike genetic diseases, which individuals are predisposed to, acquiring water, sanitation and hygiene related diseases are **controllable and preventable**. The spread of these diseases depends on environmental conditions and behaviour in the household and community. This section explores the relationship between water, sanitation and hygiene related disease and the environment.

The link between disease and environment

Diarrhoeal diseases, acute respiratory infection, measles, malaria and malnutrition are the most common causes of death in emergencies (see Figure 8-1). All these causes of death are preventable. Measures used to prevent common diseases in emergencies are shown in Table 8-1. The majority of these preventive measures are related to environmental conditions: appropriate shelter and site planning, clean water, good sanitation, vector control, personal protection such as (insecticide-treated nets, personal hygiene and health promotion. These measures address conditions in the environment, known as 'risk factors' because they can cause disease. It is important to understand the relationship between disease and environmental risk factors because interventions must target risk factors properly. Table 8-1 provides an overview of environment-related diseases and environmental risk factors that contribute to disease. It is worth noting that although malnutrition is not an environment-related disease, it is linked to diarrhoea because malnutrition increases the severity of diarrhoea while diarrhoea can cause malnutrition.

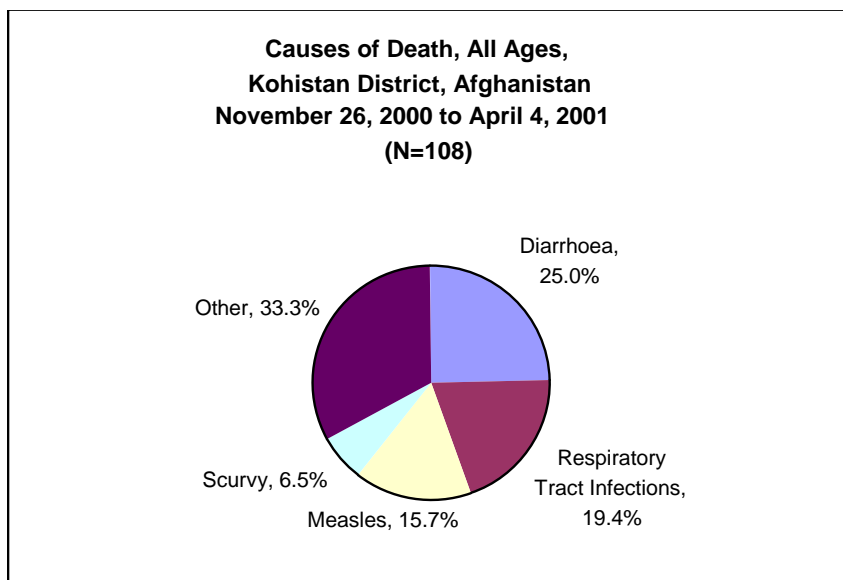*Figure 8-1: Causes of death, Kohistan district, Afghanistan[2]*

Table 8-1: Diseases targeted by preventive measures[7]

Preventive measure	Impact on spread of
Shelter, Site planning	Diarrhoeal diseases, acute respiratory infections
Clean water	Diarrhoeal diseases, typhoid fever, guinea worm
Good sanitation	Diarrhoeal diseases, vector-borne diseases, scabies
Adequate nutrition	Tuberculosis, measles, acute respiratory infections
Vaccination	Measles, meningitis, yellow fever, Japanese encephalitis, diphtheria
Vector control	Malaria, leishmaniasis, plague, Dengue, Japanese encephalitis, yellow fever, other viral haemorrhagic fevers
Personal protection (insecticide-treated nets)	Malaria, leishmaniasis
Personal hygiene	Louse-borne diseases: typhus, relapsing fever, trench fever
Health promotion	Sexually transmitted infections, HIV/AIDS, diarrhoeal diseases, and Infections during and after deliveries
Case-management	Cholera, shigellosis, tuberculosis, acute respiratory infections, malaria, Dengue, haemorrhagic fever, meningitis, relapsing fever

Table 8-2: Diseases affecting displaced populations in disasters[27]

Disease	Symptoms	Environmental risk factors	Health hazards
Acute upper respiratory tract infections	All symptoms of the common cold, fever and heavy coughing. Chest pain and pain between shoulder blades in pneumonia	Crowding, poor hygiene	Influenza and pneumonia may cause severe complications, especially in groups at risk
Diarrhoea	Watery stools at least three times a day, with or without blood or slime. Might be accompanied by fever, nausea or vomiting	Contaminated drinking water or food, or poor sanitation	Dehydration, especially in children, shown by dark colouration of urine, dry tongue or leathery skin
Cholera	Modest fever, severe, but liquid diarrhoea (rice water stools), abdominal spasms, vomiting, rapid weight loss and dehydration, rapid deterioration of condition	As for diarrhoea	As for diarrhoea
Measles	A disease of early childhood, characterised by fever and catarrhal symptoms, followed by maculopapular rash in mouth	Crowding, poor hygiene Very contagious	Severe constitutional symptoms, high case fatality rate
Malaria	Painful muscles and joints, high fever with chills, headache, possibly diarrhoea and vomiting	Breeding of *Anopheles* mosquitoes in stagnant water bodies	Disease may rapidly become fatal, unless medical care is provided within the first 48 hours

Disease	Symptoms	Environmental risk factors	Health hazards
Dengue and Dengue Haemorrhagic Fever (DHF)	High fever, headaches, pain in muscles and joints, red spots on skin	Breeding of *Aedes* mosquitoes in natural or artificial containers, filled with water	Dengue usually runs a mild course. DHF, however, is often accompanied by heavy haemorrhages, which may be fatal
Meningococcal meningitis	Infected persons may show no symptoms for a considerable time. When an epidemic is in progress, headache, fever and general malaise will suggest the diagnosis, which must be confirmed by lumbar puncture	Crowding	Often fatal if untreated at an early stage; neurological problems in survivors
Shigella dysentery	Diarrhoea with blood in the stools, fever, vomiting and abdominal cramps	Contaminated drinking water or food, or poor sanitation, poor hygiene	Case fatality rate may be high
Typhoid fever	Starts like malaria, sometimes with diarrhoea, prolonged fever, occasionally with delirium	As for diarrhoea, and contaminated foods	Without appropriate medical care, including antibiotics and surgery, may lead to fatal complications in a few weeks
Viral hepatitis A	Nausea, slight fever, pale-coloured stools, dark-coloured urine, jaundiced eye whites and skin after several days	Poor hygiene, contaminated foods and water	Long-term disabling effects
Louse-borne typhus	Prolonged fever, headache, body pains	Unhygienic conditions leading to lice infestations	May be fatal without treatment
Diptheria	Inflamed and painful throat, coughing	Crowding, poor hygiene	A secretion is deposited in the respiratory tract, which can lead to asphyxiation
Tetanus	Muscle spasms, starting in the jaws and extending to the rest of the body over several days	Poor hygiene, injury	Fatal
Rabies	Fatigue, headache, disorientation, paralysis, hyperactivity	Bit from infected animal host	Fatal if untreated
Relapsing fever (louse-borne or tick-borne)	Acute high fever at intervals	Unhygienic conditions leading to lice or tick infestations	Often fatal in untreated persons, depending on immunity levels
Heat stress	Elevated body temperatures, nausea, vomiting, headache	Excessive temperatures	Risk of coma

Box 8-3: Collaboration between health and water and sanitation sectors

Interaction between the health and water-sanitation sectors is critical in emergencies because disease surveillance data from the health sector can steer water-sanitation interventions. These give those most vulnerable to disease the highest priority in the provision of water supply, sanitation and hygiene assistance.

Disease surveillance shows where disease 'hot spots' are happening and where outbreaks are likely to occur or are starting. When the health sector communicates these hot spots to the water-sanitation sector, the crucial first steps for disease control can begin. Rapid assessments, preferably conducted in partnership between health sector personnel, water-sanitation professionals and community representatives can quickly identify key environmental risk factors that need immediate action. This prompt attention improves quick water, sanitation and hygiene. Targeting specific risk factors decrease a population's risk from disease.

Under such scenarios, close cooperation and overlap between the health and water-sanitation sectors results in a fast response to outbreaks and potential outbreaks. Working together, the health and water-sanitation sectors can prevent and control better disease outbreaks saving many lives.

Disease transmission

Illnesses related to water, sanitation and hygiene include the following:

- Water-borne diseases occur when a disease-causing agent enter the body through drinking water;
- Water-washed diseases occur because of inadequate hygiene conditions and practices;
- Water-based diseases include those illnesses that are spread through a disease vector that lives in water;
- Food-borne illnesses result when disease-causing agents enter the body through food;
- Vector-born diseases are spread by means of insect or rodent vectors.

Diarrhoeal disease is of major risk factor in emergency settings because it can cause sickness and death among children. Most diarrhoeal diseases including viral gastroenteritis, cholera, Shigellosis, typhoid, polio and some forms of hepatitis being spread by faecal-oral means are often called faecal-oral diseases. Faecal-oral disease transmission occurs when faeces, which contain disease causing pathogens, from one person enters the mouth and is ingested by another person. Faecal-oral diseases can easily spread in overcrowded unsanitary conditions, which are typical of camps and settlements in emergencies. Factors related to faecal-oral disease spread include drinking water contaminated with faecal material (which can occur at the source, during transport or in the household), poor hygiene due to a lack of water or hygienic practices and poor food hygiene (e.g. contamination of food by dirty or unwashed hands or flies). Figure 8-2 illustrates faecal-oral disease transmission.

Water reservoir India. Photo International Federation

Figure 8-2: Transmission route for pathogens found in excreta
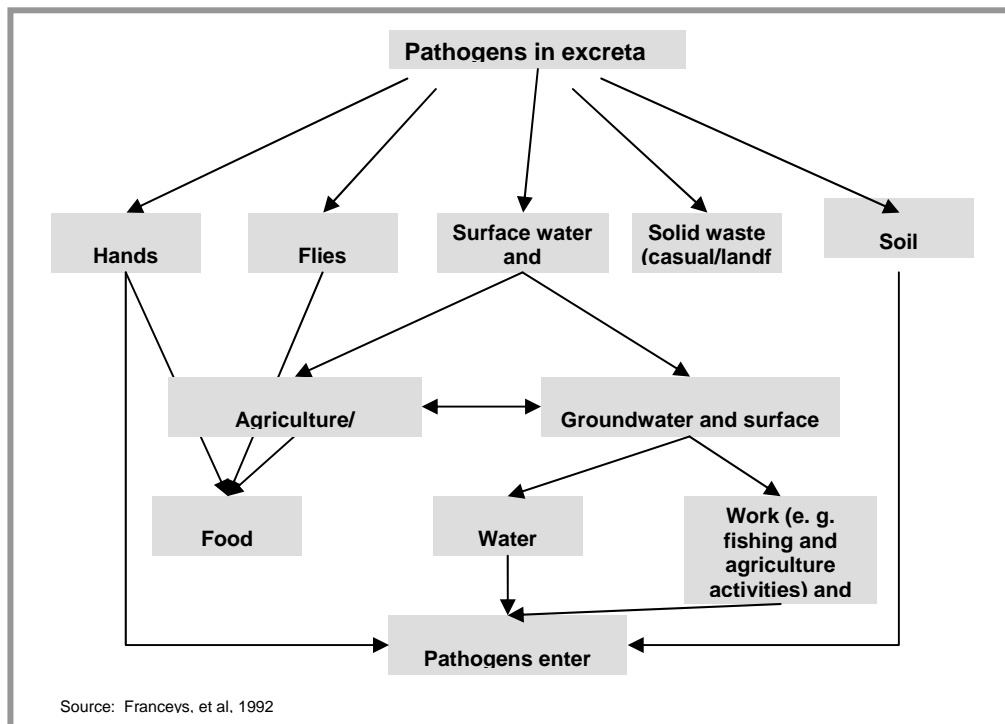
Source: Franceys, et al, 1992

Vector-related diseases occur when vectors carrying disease pathogens from an animal, human or some other reservoir to another. Vectors are defined as any animal capable of transmitting disease pathogens from one host to another by its bite or bodily functions. Pathogens can be transmitted either mechanically (e.g. trachoma which is transmitted by non-biting flies) or after biological transformation (e.g. malaria parasites by mosquitoes). Each emergency can be characterised by different types of vectors and vector-borne diseases. Examples of outbreaks in emergencies include malaria (transmitted by *Anopheles* mosquitoes), epidemic typhus (transmitted by lice) and Dengue fever (transmitted by *Aedes* mosquitoes). Where malaria is endemic, it is one of the major causes of death in emergencies. In addition to transmitting diseases, some vectors can be considered a nuisance because of their painful bites, e.g. mosquitoes, biting flies, fleas, and lice. These nuisance vectors can contribute to the stress and discomfort of an already suffering population. Table 8-3 summarises vectors and vector-borne diseases that are common in emergencies.

Table 8-3: Vectors and diseases likely to be present in emergency settlements (adapted from Wisner and Adams, 2002)

Vector	Disease transmitted
Mosquitoes	
Anopheles	Malaria, filariasis.
Culex	Japanese encephalitis, filariasis, other viral diseases.
Aedes	Yellow fever, Dengue fever, Chikungunya,filariasis, other viral diseases.
Houseflies	Diarrhoea, dysentery, conjunctivitis, typhoid fever, trachoma.
Cockroaches	Diarrhoea, dysentery, salmonellosis, cholera.
Lice	Epidemic typhus, pediculosis, relapsing fever, trench fever, skin irritation.
Bedbugs	Severe skin inflammation.
Triatomid bugs	Chagas' disease.

Vector	Disease transmitted
Mosquitoes	
Ticks	Rickettsial fever, tularaemia, relapsing fever, viral encephalitis, borreliosis.
Rodent (mites)	Rickettsial pox, scrub typhus.
Rodent (fleas)	Bubonic plague, endemic typhus.
Rodents	Rat-bite fever, leptospirosis, salmonellosis, melioidosis.
Sand fly	Leishmaniasis

Acute Respiratory Infections (ARIs), which include pneumonia, bronchiolitis and bronchitis, are a major cause of death in emergencies. Contributing factors to ARIs are poor shelters, including poor clothing and footwear (chilling in infants), overcrowding and indoor air pollution (bad ventilation in shelters). Some studies suggest that hand washing might reduce the risk of respiratory infections.[5]

Community involvement in disease prevention

The full participation of the community, its volunteers, Community Health Workers (CHWs) and extended health workers even in emergencies cannot be enough emphasised. Substantial work can be done at community level for the prevention and early detection of problems and diseases. The ultimate goal of water supply and sanitation programmes is to reduce sickness and death brought about by substandard environmental health conditions. For water supply and sanitation programmes to provide the highest possible level of benefit, it is ideal that beneficiaries be actively involved in the programme from beginning to end. Throughout this chapter, reference is made to community involvement. This term is not meant exclusively to describe the scenario where a community assists with the construction of latrines or where a community feels a sense of ownership for pipes and tanks. Community involvement is meant that the host population is given the opportunity to play an active role in water and sanitation projects throughout the project's duration, emphasising the representation of both men and women and, indeed, participation of vulnerable groups. Apart from constructing facilities, the role of the community can include ensured awareness of hazards, disease prevention and detection and preparedness to act. If people in the community contribute with ideas and decision-making, they will feel responsible for the health of their own community.

The ability of vulnerable groups to cope and survive might be seriously compromised in a disaster. It is important, therefore, that vulnerable groups be identified and given the opportunity to participate and influence water and sanitation projects to meet their and all other affected groups' needs. Emergencies also have an impact on resident or host populations as well as the refugee and displaced people. It is important that the needs of the host population be understood. The local economy can suffer because of the added demand upon it from refugees, displaced people and the host population alike. There might also not be equal access to basic services and survival needs such as food, water and health care. As emergencies progress, camps and settlements for the displaced stabilise, but the needs of the host population can be as great as and perhaps even greater than the needs of the displaced population. Therefore, it is important that response efforts include the disaster-affected host community.

Important role of the community

Experience has shown that wide-ranging benefits result when communities actively involved in their own health and participate in water and sanitation projects. Using participatory approaches to engage the community has many benefits. Such approaches give community members the opportunity to build and strengthen problem-solving skills

and empower them to take action. While communities, initially, might have limited capability to respond, giving them the opportunity to be involved helps with their own recovery process (see the mental health chapter for additional thoughts on the community recovery process). Through community involvement, water and sanitation programmes and projects can gain a thorough understanding of the needs, concerns and values of the beneficiaries. The local skills and capacities that exist among the disaster-affected population can also be identified and strengthened. Strong community involvement is critical for projects being sustainable long after external assistance stops.

The following are the main principles of participatory approaches:[27]

- Communities can and should determine their own priorities in dealing with the problems that they face;
- The enormous depth and breadth of collective experience and knowledge in a community can be built on to bring about change and improvements;
- When people understand a problem, they will more readily act to solve it;
- People solve their own problems best in a participatory group process.

The community plays an important role in helping agencies formulate change strategies for effective behaviour. Effective hygiene programmes use community knowledge to understand what will motivate people to change their behaviour—behaviour toward using and cleaning toilet facilities, toward washing hands after using toilet facilities, etc. In fact, disease prevention and good health might not be a strong factor to make people want to change. It might instead be convenience, social status, the esteem of others and financial gain that are the driving forces behind change. Engaging and getting input from community members is the best way to fully understand these driving forces.

The aim of safe water supply and adequate sanitation is to **prevent** disease rather than treat disease. Disease prevention should be a concern of the entire community because when disease is not prevented, the entire community suffers negative effects. Conversely, when disease is prevented, the entire community benefits from the positive effects. A vast range of benefits, both health and non-health related, is gained from improving water supply and sanitation and thus, preventing disease.[18] These benefits affect not only the patient, but also a much wider sphere of influence including the patient's family, the patient's community, and the health sector. Benefits from avoiding illness including money saved on health services by the patient and the heath care system and the availability of more time for the patient and family members to earn wages, go to school and focus on productive activities. As an example, a child's sickness might prevent a mother from spending as much time tending crops, earning wages, seeking firewood or hauling water as she normally would; therefore, household finances, food supplies and hygiene can all suffer. Children, particularly girls, may stay home from school so that they can help their mother with household chores that would otherwise go neglected. A father might miss work because of the needs of the family and sick children.

*Building a latrine
Photo: International
Federation*

Organising new, perhaps temporary water and sanitation systems, maintaining or repairing an already installed water and sanitation facilities must be major considerations for all construction projects including those in emergencies. When facilities stop functioning, the disease-preventing benefits gained from those facilities diminish if no backup facilities are available. For proper long-term maintenance of facilities, it is critical that the community be involved in the project at the onset and throughout the project's duration. It is worth noting that although community members might have been involved in the construction of the facilities, this does not automatically mean that they are willing to take ownership and management of the facilities and fulfil the on-going maintenance

needs that arise. The following points should be considered when community management in water, sanitation and hygiene projects is desired:[10]

- Do people in the community consider that the project responds to a priority felt need?

- Have all sections of the community been consulted? A thorough baseline data survey is necessary which identifies different groups in the community, their views about water, sanitation, health and their perceptions of the proposed project. Consensus will have to be reached on the location of installations;

- Have women been involved as far as possible in the initial discussions on the proposed project? Women are often the main water carriers and users. This might involve work on building up self-esteem and confidence among women and ensuring that men are aware of the necessity for involving women;

- Does the project have the support of the local government and community leaders? If respected community leaders are available they, rather than the agency involved, should lead the discussions;

- Have those involved in the community management and hygiene promotion aspects and those involved in the engineering components met to discuss how they can work together to achieve the goal of community management? If not, organise a short workshop to discuss the importance of this and to formulate strategies for inclusion;

- Try to ensure open and ongoing dialogue about the project. Always remain flexible and encourage suggestions from community members about how the project should proceed;

- If people do not attend meetings, try to find out why as soon as possible by discussing with people at places where they meet, e.g. at the water source. Find out if alternative arrangements can be made;

- Ensure that the issue of long-term maintenance is raised as soon as possible with community groups. Ask them how they intend to repair the system if it breaks down or what provisions they have made for this in the past. This might involve discussing with them about the need for user fees or other payments, who will administer and collect these fees, financial accountability and the need for further training in accounts and financial management. They will also need to identify who will actually do the maintenance and whether they need to be trained. Water committees can be set up;

- Maintenance issues should be discussed in an open forum in order to arrive at some consensus from all users;

- Different groups might have alternative plans for the same water points. Visits by community members to other successful or unsuccessful projects in the vicinity can be considered;

- Formal agreements and contracts should be drafted when discussions have been finalised;

- Formulate objectives, indicators and means of verification to evaluate the capacity for community management, level of participation and the degree of integration of software and hardware components to the satisfaction of the intended project beneficiaries;

This chapter will later discuss control measures for preventing disease spread. For these to be as effective, it is important that disaster-affected people including the most vulnerable be given the opportunity to be actively involved in contributing ideas and making decisions in the water and sanitation projects.

Involving the community early in the crisis

Every effort should be made to work together with disaster-affected people including vulnerable groups and the affected host community as soon as possible and to give them the opportunity to play an active role in the design, implementation and management of water and sanitation projects. Opportunities should not be missed to build on existing knowledge and capacities for solving problems and taking responsibility for the health of their own community. Providing information to the community is just the first step; community members must be given the opportunity to share their ideas and guide and direct programmes from start to finish.

Emergency response activities typically start by assessing needs. Assessments collect and analyse information used to direct and define the relief response. It is important that local knowledge contributes to defining and framing the response efforts. A wide spectrum of community involvement in assessments, including women and those from various social and economic levels, provides an excellent opportunity for the needs of the entire population to be understood from a community perspective. As an example, families and communities must be consulted as early as possible in the planning of excreta disposal facilities so that valuable information about location, design, access, cleaning and the culturally appropriateness of the proposed facilities can be decided with those who will eventually use the facilities and be responsible for their upkeep.

Box 8-4 Participatory Hygiene and Sanitation Transformation (PHAST)

The Participatory Hygiene and Sanitation Transformation (PHAST) approach is used to promote hygiene sanitation and community management of water and sanitation facilities. The approach encourages people to address and solve their own health-related problems and uses health awareness and understanding as the basis upon which people embrace lasting behaviour change toward water, sanitation and hygiene.

Recent efforts have been made to use a compressed version of PHAST in emergencies to engage disaster-affected populations early in the crisis. PHAST methodology has been applied to several emergency situations including Pakistan in 2005 by International Federation in coordination with UNICEF and in refugee camps in south-western Uganda in 2003 and 2006 by International Federation in response to cholera. In both these locations, not all seven steps of the PHAST programme were used, but rather a shortened version was adapted for the specific emergency.[29]

Water and sanitation committees

It is important for sustainability that programmes encourage beneficiaries to participate in all stages and aspects of assistance actively. One way to foster active participation is to guide community leaders and members to form water and sanitation committees. Such water and sanitation committees play a critical role in the transfer of knowledge, training and maintenance responsibility and in promoting good hygiene behaviour. Water and sanitation committees must be made up of a wide cross-section of the community including women and members of other vulnerable groups. Members of water and sanitation committees should be genuinely committed to their community by giving their services free.

There are several social benefits associated with developing water and sanitation committees. Water and sanitation committees can help to strengthen community structures that are likely to be in disarray after the emergency. Water and sanitation committees also provide the community an organised way to take action toward improving their health and well-being.

Functions of a water and sanitation committee can include:

- Actively promoting hygiene and sanitation;
- Organizing community mobilisation for the construction and protection of water supplies;
- Active involvement in vector control;
- Establishing rules for appropriate use of water, particularly when water is scarce;
- Setting enforcement procedures for rules.

Improving environmental conditions

When camps or communities hosting those displaced by a disaster become overcrowded, or traditional environmental health facilities in a village become damaged, living conditions can become unhygienic. In these situations, it might be difficult to prevent the transport or exposure of people to environmental hazards. Large-scale outbreaks of diarrhoea and other environment-related diseases are frequently reported among refugee and displaced populations, particularly during the acute emergency phase. These outbreaks may be a sign of insufficient efforts in controlling environmental hazards and monitoring the risk of disease outbreaks. Planners of emergency relief programmes must make environmental health control their top priority. Control measures should be started immediately and upgraded over time, based on urgency and available resources to achieve the minimum standards of services by the end of the acute emergency phase.

*Pakistan earthquake - The dry river bed adjacent to destroyed villages epitomized the destructive power of the quake. Two years later the water is flowing freely down the Kunhar and the shattered water supply infrastructure is being put back in place.
Photo: International Federation*

Assessing environmental health conditions

To establish effective water, sanitation and hygiene programmes in humanitarian emergencies requires a good understanding of the relationship between human and socio-economic factors and the physical landscape. The need for a proper assessment to understand this relationship cannot be overemphasised. The epidemiology chapter of this book covers more detailed assessments.

Environmental control measures that have a rapid impact but also a long-term view should be selected. Programme designers should start thinking of the long-term needs during implementation. They should also achieve the minimum standards in emergency response within three to six months. Since maintaining a clean environment depends on the cooperation of the people affected, a representative group from the community should take part in every aspect of planning and implementing water, sanitation and hygiene programmes and projects. As stated previously, representative groups should always include women and a cross-section of people from various socioeconomic levels. Chapter three of this book discusses details of programme design and management.

An assessment of the physical environment should be carried out as soon as possible after the disaster has occurred. Assessment results should identify environmental health priorities and provide enough information to design a programme quickly. Environmental health assessments should involve multiple sectors, water and sanitation, food, shelter, health services, local authorities and representatives from the disaster-affect population and local non-governmental organisations. Assessment teams must include individuals with local knowledge as well as previous experience of disasters in the country or region.

Appropriately qualified personnel such as the environmental health technician or sanitation inspector should lead the assessment.

Assessment checklists are useful for ensuring all the key questions have been examined, but they must be adapted to the particular disaster situation. Box 8-5 contains a checklist for assessing health needs and local conditions and identifying local resources. Be sure to see the checklist included in the epidemiology chapter of this book for additional details.

Box 8-5: Water supply and sanitation needs assessment checklist[24]

General

- How many people are affected and where are they? Disaggregate the data as far as possible by sex, age, disability, etc.

- What are the people's likely movements? What are the security factors for the people affected and for potential relief responses?

- What are the current or threatened water- and sanitation-related diseases? What are the extent and expected evolution of problems?

- Who are the key people to consult or contact?

- Who are the vulnerable people in the population and why?

- Is there equal access for all to existing facilities?

- What special security risks exist for women and girls?

- What water and sanitation practices were the population accustomed to before the emergency?

Water supply

- What is the current water source and who are the present users?

- How much water is available per person per day?

- What is the daily/weekly frequency of the water supply?

- Is the water available at the source sufficient for short-term and longer-term needs for all groups in the population?

- Are water collection points close enough to where people live? Are they safe?

- Is the current water supply reliable? How long will it last?

- Do people have enough containers of the appropriate size and type?

- Is the water source contaminated or at risk of contamination (microbiological or chemical/radiological)?

- Is treatment necessary? Is treatment possible? What treatment is necessary?

- Is disinfection necessary, even if the supply is not contaminated?

- Are there alternative sources nearby?

- What traditional beliefs and practices relate to the collection, storage and use of water?

- Are there any obstacles to using available supplies?

- Is it possible to move the population if water sources are inadequate?

- Is it possible to bring in tank water if water sources are inadequate?

- What are the key hygiene issues related to water supply?

- Do people have the means to use water hygienically?

Solid waste disposal

- Is solid waste a problem?

- How do people dispose of their waste? What type and quantity of solid waste is produced?

- Can solid waste be disposed of on site, or must it be collected and disposed off site?

- What is the normal practice of solid waste disposal for the affected population? (Compost/refuse pit? collection system? bins?)

- Are there medical facilities and activities producing waste? How is this being disposed of? Who is responsible?

Excreta disposal

- What is the current defecation practice? If it is open defecation, is there a designated area? Is the area secure?

- What are the current beliefs and practices, including gender-specific practices, concerning excreta disposal?

- Are there any existing facilities? If so, are they used, are they sufficient and are they operating successfully? Can they be extended or adapted?

- Is the current defecation practice a threat to water supplies (surface or ground water) or living areas?

- Do people wash their hands after defecation and before food preparation and eating? Are soap and other cleansing materials available?

- Are people familiar with the construction and use of toilets?

- What local materials are available for constructing toilets?

- Are people prepared to use latrines, defecation fields, trenches, etc.?

- Is there sufficient space for defecation fields, pit latrines, toilets, etc.?

- What is the slope of the terrain?

- What is the level of the groundwater table?

- Are soil conditions suitable for on site excreta disposal?

- Do current excreta disposal arrangements encourage vectors?

- Are there materials or water available for anal cleansing? How do people normally dispose of these materials?

- How do women deal with menstruation issues? Are there appropriate materials or facilities available for these issues?

Vector-borne diseases

- What are the vector-borne disease risks and how serious are these risks?

- What traditional beliefs and practices relate to vectors and vector-borne diseases? Are any of these either useful or harmful?

- If vector-borne disease risks are high, do people at risk have access to individual protection?

- Is it possible to make changes to the local environment by drainage, scrub clearance, excreta disposal, refuse disposal, etc. to discourage vector breeding?

- Is it necessary to control vectors by chemical means? What programmes, regulations and resources exist for vector control and the use of chemicals?

- What information and safety precautions need to be provided to households?

Drainage

- Is there a drainage problem (e.g. flooding of dwellings or toilets, vector breeding sites, polluted water contaminating living areas or water supplies)?
- Is the soil prone to water logging?
- Do people have the means to protect their shelters and latrines from local flooding?

There are various techniques for gathering assessment information and these should be carried out in a systematic way. Key people can be interviewed first followed by a review of existing records. Afterwards, existing water and sanitation systems should be inspected. A rapid survey can be organised to collect information from a sample of the displaced population. The goal is to ask as few questions as possible about the key topics. Figure 8-3 provides an example of a questionnaire for assessing water consumption and latrine coverage.

Figure 8-3: Example of a survey questionnaire

Household water survey

Date:_____

Interviewer:_____

Location:_____

Household number:_____

1. *Introduce yourself and explain the purpose of the survey.*

2. *Ask the person who collects water for the household*:

    How much water did you and other family members collect yesterday (for all purposes)? _____

3. How many water vessels do you have? Number _____; Estimate total volume _____

4. a. How many members are there in your family? _____

    b. How many of them consumed water yesterday? _____

5. Does your family have a latrine? _____

6. How many other families share the latrine? _____

7. Do you own livestock? _____

    If yes, what kind of livestock and how many?
    _____

After the assessment, all the information should be analysed and presented in a way that allows for transparent and consistent decision-making. For example, average water consumption and latrine coverage can be calculated using data from the above questionnaire shown in the following (see Box 8-6).

8

Water, sanitation and hygiene in emergencies

Box 8-6: Calculations drawn from questionnaire

- Average Water Consumption = $\dfrac{\text{Total amount of water collected}}{\text{Total number of family members present}}$

While family members often do not divide water equally among members, this will give planners an approximate water consumption average.

- Latrine Coverage = $\sum \dfrac{\text{Number of latrines}}{\text{Total number of families interviewed}}$

- Give the family credit for ½ or ⅓ of a latrine, depending on their sharing habits with other families.

The assessment helps relief planners determine whether external resources are needed, depending on the national standards for water supply, sanitation and vector control of the host country. Box 8-7 provides an example outline of conclusions for an environmental health assessment report.

Box 8-7: Conclusions of an environmental health assessment

- Main hazard affecting the disaster situation (human excreta, vectors) should be stated.

- Current measures to control the hazard (note whether they are adequate).

- Immediate and future actions if necessary should be outlined, using a phased approach. Actions may include the following environmental health interventions:

- Setting up temporary defecation areas until other solutions are available to improve the general hygiene.

- Providing sufficient quantities of quality water and restoring damaged water systems.

- Reducing the vector and rodent populations to acceptable levels.

- Promotion of safe hygiene practices at household level including reinforcing 'hand-washing' at critical times.

- External resources required (technical skills, chemicals, equipment or spare parts, staff to organise culturally and technically appropriate defecation facilities or areas).

- Further investigations if necessary (e.g. by a road, water or sanitation engineer).

Standards and key indicators

The minimum standards and key indicators presented in this chapter are taken from 'The Sphere Project, Humanitarian Charter and Minimum Standards in Disaster Response.'[24] Standards represent the ideal to be strived for in emergencies while key indicators are used to measure progress toward the standards. Measuring this progress is important for identifying gaps and for monitoring and evaluating work accomplished. This chapter highlights important points about key indicators, but is not meant to duplicate all the detailed explanations in the guidance notes provided by the Sphere Project. The key indicators, therefore, presented in this chapter should be read in conjunction with the Sphere Project guidance notes for each key indicator.[24]

Standards that are common to all sectors (water-sanitation, food, shelter and health) are highlighted below. See 'The Sphere Project' for key indicators and guidance notes for these standards.[24]

- Participation: the disaster-affected population actively participates in the assessment, design, implementation, monitoring and evaluation of the assistance programme;

- Initial Assessment: assessments provide an understanding of the disaster situation and a clear analysis of threats to life, dignity, health and livelihoods to determine, in consultation with the relevant authorities, whether an external response is required and, if so, the nature of the response;

- Response: a humanitarian response is required where the relevant authorities are unable or unwilling to respond to the population's protection and assistance needs on the territory over which it has control and when assessment and analysis indicate that these needs are unmet;

- Targeting: humanitarian assistance or services must be provided equitably and impartially based on the vulnerability and needs of individuals or groups affected by disaster;

- Monitoring: the effectiveness of the programme's response to problems is identified and changes in the broader context are continually monitored to improve the programme or to phasing it out as required;

- Evaluation: there is a systematic and impartial examination of humanitarian action, intended to draw lessons to improve practice, policy and to enhance accountability;

- Aid worker competencies and responsibilities: aid workers must possess appropriate qualifications, attitudes and experience to plan and effectively implement appropriate programmes;

- Supervision, management and support personnel: aid workers receive supervision and support to ensure effective implementation of the humanitarian assistance programme.

This section discusses standards, key indicators and controls measures for the following:
- Excreta disposal;
- Water quantity;
- Water quality;
- Hygiene;
- Food safety;
- Vector control;
- Solid waste management;
- Drainage.

Excreta disposal

Among the first priorities in an emergency must be containing and disposing human faeces which must not contaminate the environment including drinking-water sources and, thus, lead to the spread of disease. Appropriate facilities for defecation are vital to people's health as well as their dignity, safety and well-being.

Standards and key indicators for excrete disposal

The following are minimum standards for excreta disposal facilities (toilets and/or latrines): [24]

- Toilets are installed in sufficient number to allow for acceptable use;
- Toilets are installed sufficiently close to dwellings to allow for rapid and safe use at all times of the day and night; and
- Toilets are sited, designed, constructed, and maintained so that they are comfortable, hygienic and safe to use.

To measure progress toward excreta disposal standards, key indicators have been developed which corresponds to the above standards on excreta disposal (see Box 8-8 and Box 8-9).

8

Box 8-8: Key indicators for access to toilets and number of toilets[24]

- A maximum of twenty people should use each toilet;

- Use of toilets is arranged by household(s) and/or segregated by sex;

- Separate toilets for women and men are available in public places (markets, distribution centres, health centres, etc.);

- Shared or public toilets are cleaned and maintained in such a way that they are used by all intended users;

- Toilets are no more than fifty metres from dwellings;

- Toilets are used in the most hygienic way;

- Children's faeces are disposed of immediately and hygienically.

Box 8-9: Key Indicators for design, construction, and use of toilets[24]

- Users especially women must be consulted and approve of the location and design of the toilet.

- Toilets are designed, built, and located to have the following features:

- Designed in such a way that they can be used by all sections of the population, including children, older people, pregnant women, and the physically and mentally disabled;

- Sited to minimise threats to users, especially women and girls, throughout the day and night;

- Sufficiently easy to keep clean to invite use and do not present a health hazard;

- Provide a degree of privacy in line with the norms of the users;

- Allow for the disposal of women's sanitary protection, or provide women with the necessary privacy for washing and drying sanitary protection cloths;

- Minimise fly and mosquito breeding;

- All toilets constructed to use water for flushing and/or a hygienic seal have an adequate and regular supply of water;

- Pit latrines and soakaways (for most soils) are at least thirty metres from any groundwater source and the bottom of any latrine is at least 1.5 metres above the water table (during high water table season);

- Drainage or spillage from any defecation system must not run towards any surface water source or shallow groundwater source;

- People wash their hands after defecation, after contact with children's faeces, before feeding themselves or children and before food preparation;

- People are provided the tools and materials for constructing, maintaining, and cleaning their own toilets if appropriate.

Basic excreta disposal concepts

In humanitarian emergencies, establishing a sanitation system for large, displaced populations should be among the first priorities. Epidemiological studies in developing countries have shown that use of latrines or other excreta containment facilities provides greater protection against diarrhoeal diseases than any other environmental health measure. Although the type of facility varies between settings and cultures, several basic concepts always apply and are presented below.

The purpose of a sanitation system is to contain human excreta at the moment of defecation so that it is not free to spread throughout the environment. Getting as many people to use excreta containment facilities as often as possible is the goal of all sanitation programmes. Sanitation workers should clearly communicate to the affected population how essential it is for everyone to defecate every time in the excreta containment facilities. Whatever the circumstances, an appropriate sanitation programme must be developed that considers the following:

- In some cultures, there is need to build separate latrines for men and women and special latrines for children;
- In some settings, latrines might be needed at places of work or public gathering areas (markets, health facilities, etc.).

People's excreta poses little hazard to themselves. Faeces from one's family members might be less hazardous than other people's because families are more likely to have common immunological histories as a result of exchanging pathogens on an ongoing basis. Where possible, different households should not share latrines or toilets, because latrine cleaning and maintenance is an unpleasant task in virtually all cultures, having a latrine for every household helps maintain clean facilities. However, the health benefits of having enough latrines for each family must be balanced against the time, effort, and expense of building them.

Mortality and morbidity rates among displaced populations in the first days and weeks of a crisis are often many times higher than for the same population once it has settled. Providing some type of sanitation facilities during the first days of a crisis is critical for preventing outbreaks of diarrhoeal diseases. Some latrines should be built either before the population arrives at a site (which is rare) or defecation fields should be established immediately following their arrival. A proper site must be reserved for defecation fields at the outset of a crisis. These fields must be away from water sources but not too far from the dwellings that discourages people from using them.

Young children pose a particular concern for excreta control programmes. Children experience a disproportionate amount of diarrhoea compared to other members of the population; they, therefore, shed the most hazardous faeces. Their defecation habits are particularly difficult to control. The solution to this problem involves two steps:

- First, educate child-care providers about proper handling of children's faeces and the importance of washing their own hands after cleaning children and handling children's faeces;
- Second, child-friendly latrines must be made available. Child-friendly latrines are not dark (perhaps even have no walls) and have a squat hole that is smaller than an adult latrine's.

The habits and beliefs of the displaced people will determine what structures and materials are most appropriate. Most latrine/toilet options perform the primary task of containing excreta whether they are above-grade barrels, pit latrines, or solar-heated composting toilets. It is best to let the displaced population match the proper hardware and educational inputs according to their own beliefs and habits. Letting displaced populations design and construct sanitation facilities, especially if each household can construct latrines for itself, can help to assure that facilities will be used and maintained properly.

Excreta disposal during initial response phase

During the first days of the emergency, toilets/latrines might not be available; therefore, immediate short-term solutions for excreta disposal are needed. Such solutions include open defecation fields or trench defecation fields. It is important that open and trench defecation fields and all other excreta disposal facilities be constructed away from water sources and downhill from settlements (to avoid excreta-contaminated runoff from reaching the living environment after rainfall). For technical details on proper construction of open and trench defecation fields and other excreta disposal systems including simple pit latrines and Ventilated Improved Pit latrines. See the inter agency manual 'Excreta disposal in emergencies'[31] or 'Emergency Sanitation: Assessment and Programme Design.'[15]

Throughout the emergency, hand-washing facilities should be made available along with excreta disposal facilities. In addition, education on the importance of hand washing for disease prevention should also be provided. See the hygiene section for more details.

At the emergency's onset, fifty people per toilet/latrine is usually the target if meeting twenty people per toilet/latrine is not possible. The ultimate goal is one latrine per family which helps to ensure that latrines are kept clean. For ensuring cleanliness, family latrines are preferred over communal latrines. Cleanliness is one of the many factors to be considered when deciding whether to install communal or family latrines. Other factors include speed of construction, technical quality, construction costs, maintenance costs, technical possibilities, access, security and development issues (Table 8-4).

Table 8-4: Advantages and disadvantages of communal and family latrines[1, 16]

Factor	Communal	Family
Speed of construction	Can be constructed fast by well-trained and well-equipped teams although rate of construction limited by number of staff and equipment.	Can take considerable time to train families initially, but large numbers of latrines might be built quickly.
Technical quality	Quality of design and construction easier to control but innovative ideas from users might be missed.	Potential for innovative ideas of users, but more difficult to ensure good location and construction.
Construction costs	Use of materials can be easily controlled but labour must be paid for.	Construction labour and some materials might be free, but families might not have the time or the right skills.
Maintenance costs	Maintenance, repair and replacement costs are easier to predict and plan, but staff is required to clean and maintain facilities in long-term.	Users take responsibility for cleaning and maintenance but recurrent costs are less predictable.
Technical possibilities	Heavy equipment and specialised techniques might be used when necessary (e.g. rocky ground).	Families might not be able to dig in hard rock or build raised pit latrines where the water table is high.
Cleaning and hygiene	Users do not have to clean latrines, but these are often dirty and a greater mix of users increases the risk of disease transmission.	Latrines are often cleaner but many users might prefer not to be responsible for construction, cleaning and maintenance.
Access and security	Latrines might be less accessible and more insecure, particularly for women.	Latrines are often more accessible (closer to dwellings) and safer.
Development issues	People might lose or not acquire the habit of looking after their own latrine.	People keep or develop the habit of managing their own latrines.

Long-term plan for excreta disposal

Early in the emergency, consideration should be given to a master long-term plan for excreta disposal for the camps and settlements particularly if population growth or expansion is likely. Location of dwellings is important because dense concentrations of dwellings can lead to long-term problems with excreta disposal facilities and other health-related concerns. A minimum surface area of 45 m^2 should be available for each person.[24] Besides initial space requirements, excreta disposal facilities also require replacement areas, which are needed when initial facilities fill up or fail. Although replacement areas might not be needed until many months into the crisis, they should be identified and reserved early in the emergency.

Understanding the needs of the community is important to the success of sanitation programmes. Every effort should be made to have community members shape and guide programmes. The spectrum of ways the community can be involved is wide and could include many things such as construction of facilities; contributing ideas; making decisions or taking responsibility for installed facilities. Many aspects of excreta disposal, including those listed below, benefit from community input, guidance and decision-making.

- It is vital that community input is sought on the best methods and messages for convincing people why and how to properly use and maintain latrines;
- Community feedback is needed on whether families have the necessary knowledge, tools and materials for constructing, maintaining, cleaning and properly abandoning old facilities;
- Input from community members on existing hygiene practices steers promotion programmes aimed at the need and use of child-friendly disposal facilities and the proper disposal for child faeces by burying or disposing of it in a latrine/toilet;
- Community members provide critical information about facility locations being close enough to dwellings so that assaults on women and children are less likely;
- Consultation with community members from vulnerable groups e.g. women, older people, disabled people, people living with HIV/AIDS etc. can ensure that their needs are being adequately met.

Options for excreta disposal

The following factors should be considered when selecting sanitation systems:

- Acceptance—cultural factors are considered in the design;
- Access—the population has access to latrines;
- Use—the population is educated on proper latrine use;
- Maintenance—proper maintenance of latrines is organised;
- Drainage—the latrines are protected from surface water drainage.

Listed below are brief explanations of different types of disposal facilities that are typical to emergencies. For more details on excreta disposal facilities see 'A Guide to the Development of on site Sanitation'[12] and 'Emergency Sanitation, Assessment and Programme Design.'[15]

Defecation Fields

In arid and semi-arid climates, reserving specific areas for defecating can be an acceptable means for keeping people separate from their excreta. In all settings and climates, defecation fields might be a necessary choice in the first days of an acute emergency. To provide optimal health protection, defecation fields should have the following characteristics:

▪ Defecation areas should be located away from water sources to prevent contamination of the source and be located downhill of dwellings to prevent contamination of living areas with excrement after rainfall;

▪ Defecation areas should be close enough to the population so that they will be used even in the evening hours;

▪ Defecation areas should be clearly marked so that people understand where they are suppose to defecate;

▪ Because the need for privacy varies between cultures, local representatives should be consulted to determine if separate facilities for males and females are mandatory or if screens are adequate.

Defecation fields should be managed so that some areas are used for a day or two and then closed as unused areas are opened. If the defecation field is on a slope, it is wise to start using a strip at the bottom that runs across the slope (not up and down) and then move up. People can be guided to the open portions of the defecation zone either by ropes or tapes, screens which provide some privacy or by gangplanks. Whatever mechanism is used to guide people, it should be moved periodically to prevent them from having to wade through areas with excessive faecal contamination.

Trench Latrines

A communal type of latrine is often used when sanitation facilities are needed quickly and defecation fields are not appropriate. The fastest and easiest type of communal latrine to construct is a trench latrine. This is simply a trench measuring about 0.5 to 1m in depth and width and of varying length. Such a trench can be dug very quickly with a backhoe. A board or logs are placed across the trench so that people can squat over the void and defecate. Most often, the dirt from the trench is left in a pile beside the latrine and a thin layer of soil is shovelled on top of the excreta on a daily basis. This acts to reduce odours and control flies. It also causes the trench to fill quickly. Therefore, depending on the number of people served per trench and the size of the trenches, digging new trenches will be necessary every few days. Because a trench latrine can be dug fast and easily, it allows a large population to be served by many facilities quickly.

Barrel Latrines

A barrel latrine is an option in places where the water table is high, the soil too hard to dig or the weather is cold and therefore need indoor latrines. Typically, there are two designs:

▪ The first type uses the bottom half of a 200-litre metal barrel. A piece of plywood or other material with a squat hole in the middle is placed over the top of the barrel to serve as a platform. People step onto the platform to defecate into the barrel. When the barrel is approximately half filled, the platform is removed and the barrel is taken to a dumpsite and emptied, and then brought back for reuse. Some military manuals suggest pouring gasoline into the barrel and burning the contents. This is only recommended when sanitary disposal is not possible (e.g. where there is a very high water table) and should only be used with great caution;

▪ The second type of barrel latrine uses an entire 200-litre barrel as a collection vessel. However, because a 200-litre barrel is more than a mere high, a platform with steps must be built so that people can get above the barrel and defecate into it. The barrel is periodically emptied as with the half-barrel design.

Pit Latrines

The most commonly selected sanitation option for displaced populations is the pit latrine. A pit latrine is a wide hole in the ground that is covered by a platform with a squat hole to defecate through. Designs vary from a simple latrine made with a hole in the ground with two logs across it, to elaborate composting latrines that separate faeces and urine and have a vent to make them odour free. Most areas throughout the world have a local latrine

design that usually has a superstructure with walls to provide privacy. Preferably, each household or family will usually build culturally appropriate latrines if they are given the proper construction materials and some guidance. As mentioned earlier, the key point is for everyone involved to understand that the goal is for as many people as possible to use a latrine with as little sharing as possible. It is important to note that pit latrines are not an option where the water table is high or the soil is shallow or hard.

Pour flush latrines or flush toilets

Toilets that are flushed with a bucket of water or those that flush on their own are the norm in many parts of the world, but they are rarely appropriate during a complex emergency. A pour flush toilet is a basin with a water trap at the bottom and a pipe to carry sewage to a soak-away pit or sewer. The water trap (a tube that curves up from the bottom of the basin a few centimetres above the bottom and then curves downward again) causes the basin to hold between 200ml and two litres of water. After defecating in the basin, two to five litres are poured onto the basin. This causes the waste to be flushed away. The advantage of this system is that it is relatively clean and odour free. However, the disadvantages of pour flush latrines are greater. Not only do such designs use large amounts of water, but they also require a sewage collection system that is expensive and time consuming to build. Where piped water or other plentiful water sources are available, water-flushing options might be suitable.

Water quantity

One of the major goals of water supply programmes is to provide **enough water** to meet drinking, cooking and hygiene needs. In this chapter, personal hygiene needs include bathing, hand washing. Domestic hygiene needs are related to the upkeep and cleaning of the household environment including the cleaning of water storage containers, cookware and utensils. Providing enough water to meet hygiene needs is very important because diarrhoeal disease that is a major cause of death in emergencies often occurs where hygiene is poor. Adequate quantities of water are needed to keep up good hygiene practices and thus lower the risk of diarrhoeal diseases.

In developing countries, providing people with **increased amounts** of water is more effective in protecting against faecal-oral pathogens than providing them with **cleaner** water. At least fifteen litres per person per day is needed to maintain human health. While the availability of water is influenced by the situation, more water can almost always be obtained with more resources (more wells, trucks or pipes). Since obtaining water in arid areas is expensive and the relationship between water quantity and health is not well understood, there is a tendency not to invest enough in water infrastructure when other demands seem more serious. Therefore, monitoring the availability of water during emergencies is an essential component of a public health programme.

Water sources

As previously mentioned, the chronic phase of emergencies can last several years. Therefore, it is important that decisions made early in the emergency about water supply consider the likelihood that the disaster-affected population will need dependable water supplies for years to come.

In this section, we refer to the different types of water sources that people use for their water supply. water sources fall into three general categories:

- Rainwater, generally though pure, is not reliable or a sufficient source to provide for a large displaced population. It is rarely considered during complex emergencies;
- Surface water from lakes, ponds, streams and rivers is accessible, easily collected, reliable and plentiful. Its disadvantage is its being microbiologically unsafe, therefore requiring treatment;

- Groundwater from wells, springs, etc. tends to be of a higher microbiological quality (having undergone natural soil filtration underground). However, it is relatively difficult to extract. More technology and energy is needed compared with other water sources to bring underground water to the surface. A spring is a location where groundwater naturally flows upward to the earth's surface.

The following factors are important when selecting the type of water sources for emergency situations:[17]

- Acceptable yield—existing demand on the source, present yield, predicted future and seasonal yield;
- Requirements to obtain an acceptable quality—current water quality problems, predicted future and seasonal water quality problems, treatment process required;
- Management, legal, security or socio-political and cultural constraints;
- Technical and operation and maintenance requirements—protection, abstraction method and structures, treatment, transmission distance and method, supply storage, distribution;
- Resources and logistical restraints—material and equipment resources, human resources, logistical;
- Time of set-up;
- Ease of Operation and Maintenance (O&M);
- Impacts of development—on aquifers, existing users and local population, on vegetation and erosion and on water treatment and waste disposal;
- Costs—capital, O&M.

Box 8-10 provides guidelines for the maximum number of people per water source assuming access is available for eight hours per day.[24]

Box 8-10: Guidelines for maximum people per water source[24]

250 people per tap	Based on a flow of 7.5 litres/minute
500 people per hand pump	Based on a flow of 16.6 litres/minute
400 people per single-user open well	Based on a flow of 12.5 litres/minute

Standards and key indicators related to water quantity

The following are minimum standards for water supply quantity and related aspects of quantity including access and water use facilities and goods:[24]

- All people have safe and equitable access to a sufficient quantity of water for drinking, cooking, personal and domestic hygiene;
- Public water points are sufficiently close to households to enable use of the minimum water requirement;
- People have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking, personal hygiene and to ensure that drinking water remains safe until it is consumed.

Key indicators for measuring progress toward water quantity standards are presented in Box 8-11 and Box 8-12.

Box 8-11: Key indicators for access and water quantity[24]

- Average water use for drinking, cooking and personal hygiene in any household is at least fifteen litres per person per day;

- The maximum distance from any household to the nearest water point is 500 metres;

- Queuing time at a water source is no more than fifteen minutes;

- It takes no more than three minutes to fill a 20-litre container;

- Water sources and systems are maintained so that appropriate quantities of water are consistently available.

Box 8-12: Key Indicators for water use facilities and goods[24]

- Each household has at least two clean water collecting containers of ten to twenty litres, plus enough clean water storage containers to ensure there is always water in the household;

- There is at least 250g of soap available for personal hygiene per person per month;

- Where communal bathing facilities are necessary, that sufficient bathing cubicles are available with separate cubicles for males and females, and that they are used appropriately and equitably;

- Where communal laundry facilities are necessary, that there is at least one washing basin per 100 people, that private laundering areas are available for women to wash and dry undergarments and sanitary clothes;

- The participation of all vulnerable groups is actively encouraged in the location and construction of bathing facilities and/or the production and distribution of soap, and/or the use and promotion of suitable alternatives.

Factors affecting water accessibility

Several factors affect whether a household has enough water. Enough water at the tap or hand pump is a primary concern, but it is not the only concern. The accessibility of water must also be considered. Factors affecting accessibility include security, equal sharing of water, distance to water points and supplies for storing and collecting water.

- Security is important for all users to have safe access to water points. Water supplies should be sited so that hauling and retrieval does not expose people, especially women and girls who typically haul water, to the risk of assault;

- Equal share to water supplies. All segments of the community, particularly the most vulnerable, must have an equal share of water supplies;

- Distance to water points. Water points should be sited sufficiently close to dwellings to ease hauling efforts;

- Supplies for collecting and storing. An adequate number of containers must be available for collecting, storing and using water at the household level. Containers must be of sufficient condition so that they do not contribute to the risk of disease;

- Continuity issues. Water supply should be available at appropriate times including peak use times as in the morning hours when people wake up and during evening hours in preparation of meals and washing.

How much water is enough?

The amount of water a person needs for daily activities and maintain good health depends on many factors including the climate, the type of excreta disposal facilities used, people's habits and cultural practices, foods eaten and practices in food preparation. Table 8-5 provides an overview of basic water needs for the survival of a single person.

Table 8-5: Simplified table of basic survival water needs per person[24]

Survival needs: water intake (drinking and food)	2.5 to 3 litres per day	Depends on: the climate and individual physiology
Basic hygiene practices	2 to 6 litres per day	Depends on social and cultural norms
Basic cooking needs	3 to 6 litres per day	Depends on: food type, social as well as cultural norms
Total basic water needs	7.5 to 15 litres per day	

Ensuring adequate water supplies

During the acute emergency phase, water consumption should be estimated weekly. Often, the utility company or relief organisation providing water to a displaced population has these estimates. It is important to clarify that water consumption means **what people receive** not what the **water team produces**. Disagreements can arise between 'production' and 'consumption' estimates because:

- Water can be lost or wasted during pumping and transport;
- Lack of water containers can prevent people from collecting enough water.

Surveys or household interviews that document the amount of water collected at watering points or people's actual use of water are preferable to simply dividing the amount of water produced at a well or a plant by the number of people served. Cholera outbreak investigations have repeatedly shown that not owning a bucket (and thus, not being able to haul adequate quantities of water) puts families at an increased risk of illness or death. Therefore, not only should the average water consumption be fifteen litres per day or more, but there should not be anyone in the population with very low water consumption (less than seven litres per day). All families should also be provided with suitable water containers for daily collection and storage of water.

When investigating water use, attention should be given to vulnerable groups, particular those who have difficulty hauling water including the elderly, disabled and people living with HIV/AIDS and other diseases. People living on the perimeter of the camp or settlement should also be included in all water use investigations because the distance they must travel to water points and other factors might contribute to their having a lower water consumption.

Water quality

Drinking water safety is an important public health issue in emergencies. Of particular concern is the risk of water-borne diseases from water contaminated with faecal and other pathogens. Individuals affected by emergencies are often more vulnerable to disease because of malnourishment, stress and fatigue. Because of this increased vulnerability, it is important that water supplies are of good quality. At each point throughout the water supply chain from the source, through transport and to storage at the household, consideration must be given to keeping water safe. Often, safe water is produced but then often contaminated during transport or during its storage.

When choosing a water source, a source requiring little or no treatment is preferred as long as it can provide sufficient quantities of water. However, treatment of some water sources is necessary to bring water supplies to acceptable quality standards. Special consideration must be given to the long-term affordability, simplicity and reliability of the source and the treatment process required.

When emergencies occur, populations might have to relocate to places with only unprotected water sources. Unprotected water sources are more easily contaminated than protected sources. The use of unprotected sources poses a greater risk for disease than protected sources. When densely populated camps and settlements with inadequate excreta disposal are located near unprotected water sources, contamination is likely to occur. In emergencies caused by natural disasters, water quality is often a major concern. Floods might contaminate water sources such as wells, boreholes and surface water with faecal matter from overflowing latrines and sewers. In earthquakes and mudslides, faecal contamination can enter damaged water lines from damaged sewer lines. During droughts, scarce water can force people to use water from unprotected sources.

Standards and key indicators for water quality

The following is the minimum standard for water quality:[24]

▪ Water is palatable and of sufficient quality to be drunk and used for personal and domestic hygiene without causing significant risk to health.

To help measure progress toward this standard, key indicators corresponding to this standard are presented in Box 8-13.

Box 8-13: Key indicators for water quality[24]

- Sanitary survey indicates a low risk of faecal contamination;

- No faecal coliforms per 100ml at the point of delivery;

- People drink water from a protected or treated source in preference to other readily available water sources;

- Steps are taken to minimise post-delivery contamination;

- For piped water systems or for all water supplies at the time of risk or presence of a diarrhoea epidemic, water is treated with a disinfectant so that there is free chlorine residual at the tap of 0.5 mg per litre and turbidity is below five Nephelometric Turbidity Units (NTUs);

- No negative health effect is detected due to short-term use of water contaminated by chemical or radiological sources and assessment shows no significant probability of such an effect;

- Water collection and storage containers have narrow necks and/or covers or other safe means of storage, drawing, handling and are demonstrably used.

Assessing quality

Monitor water safety during emergencies. Sanitary inspections are one way to assess water supplies for deficiencies that could lead to contamination. A sanitary inspection is an on site review of water supply systems. They are used to identify actual and potential sources of contamination. The results of sanitary inspections should be used to direct action to correct contamination risks. WHO Fact Sheet [2.1] 'Sanitary Inspections,' provides details forms and diagrams for conducting sanitary inspections.

As well as sanitary inspections, water testing is another method to assess water quality, which is usually measured by the presence of specific groups of micro-organisms. This

indicates the possible presence of faeces. Because human faeces typically contain tens of millions of bacteria per gram, even the smallest trace of faeces in water is often detectable by bacterial monitoring. Faecal coliforms are a category of bacteria that match the characteristics of bacteria found in the stool of warm-blooded mammals. Other indicator bacteria such as E. coli, faecal streptococci or total coliforms, are maintained by the same premise: absence implies safe water.

Under ideal circumstances, no faecal coliforms should be present in water supplies. This ideal should be strived for in emergencies. In reality however, water supplies can contain varying levels of faecal coliforms. It is important to be able to identify the level of pollution in water supplies. Guidelines for water quality are provided in Table 8-6.

Table 8-6: Guidelines for water quality[14]

Faecal coliforms (per 100 mls of water)	Water quality
0-10	Reasonable quality
10-100	Polluted
100-1,000	Very polluted
1,000+	Grossly polluted

The above table shows that the result **no faecal coliforms in water** is a good indication that there are **no** faecal-oral bacterial pathogens present, whereas finding **low** levels of faecal coliforms in water does not mean that the water is dangerous. It is important to note that contaminated water sources should not be closed until sources that are more favourable become available.

Water quality testing can be performed by a competent local laboratory or by using field-testing kits (e.g. the Oxfam/Del Agua Kit). Field test kits are expensive and require trained people to use them and interpret results. Testing of faecal coliforms must be done within one hour of sampling if the water sample is kept at ambient temperature or within six hours if the sample is kept between 4 ºC and 6ºC.

When water supplies are disinfected by chlorine, it is better to test for free available chlorine than to test for faecal coliforms. Levels of free available chlorine between 0.2 mg/l to and 0.5 mg/l at distribution points indicate appropriate disinfection levels.

Minimum water quality standards

Table 8-7 summarises core water quality features.[16] These features provide information about water acceptability and treatment requirements. Additional information about water quality analysis and secondary features, which determine the chemical quality of water, can be found in 'Emergency Water Sources, Guidelines for Selection and Treatment'[17] and 'Guidelines for Drinking-Water Quality'.[14]

A Sri Lanka Red Crescent Society volunteer checks the chlorine content of water during the tsunami operation.- Photo: Christoffer Regild International Federation

Table 8-7: Core tests for drinking water quality[16]

Test	Why the feature is important	Suggested guideline levels (maximum)		
		Survival	Longer Term	
			Minimum recommendation	WHO guidelines (1993)
Turbidity	Acceptability to the consumer and determines treatment requirements (reduces effectiveness of disinfection)	20 Nephelometric Turbidity Units (NTU)	10 NTU	5 NTU 1 NTU for disinfection
Odour	Acceptability to the consumer and can indicate the presence of other pollutants	No restriction	Acceptable to the consumers	Should be acceptable to consumers
Colour	Acceptability to the consumer and can indicate the presence of other pollutants	No restriction	Acceptable to the consumers	15 True Colour Units (TCU)
Conductivity	Acceptability to the consumer (taste), corrosion and encrustation	No restriction	1,400 µS/cm	1,400 µS/cm (from 1000mg/l Total Dissolved Solids (TDS))
pH	Effects treatment requirements, corrosion and acceptability to the consumer (taste)	No restriction	6 to 8 for coagulation with aluminium sulphate <8 for disinfection	Preferably < 8.0 for effective disinfection with chlorine
E.coli	Indication of the possible presence of pathogens	Always aim to disinfect supplies If this is not possible then: <1,000 thermotolerant coliform (E.coli) / 100ml	Always aim to disinfect supplies If this is not possible then: <10 thermotolerant coliform (E.coli) / 100ml	0 thermotolerant coliform / 100ml

Keeping water safe along the supply chain

The water supply chain is water that is taken from its source and transported before eventually being stored for use or consumption. Along this delivery chain, potable water must be protected from contamination by human and animal faeces, urine or any other hazardous material. It is important that water sources be kept as safe as possible from contamination. Good construction practices are vital for ensuring safe water quality. Such practices include:

- Protecting water sources from runoff and other contamination by constructing rainfall runoff trenches and embankments and by ensuring that the top of wells are sealed against runoff;
- Constructing latrines far away from water sources (thirty metres minimum);
- Keeping wells protected with fencing or low walls;

▪ Keep areas near the well as clean as possible by removing refuse or stagnant water;

▪ For open wells, eliminate contamination from buckets by installing hand pump or other sanitary means of abstraction;

▪ Protect spring water so that it can be collected without contamination by building a spring box which is a collection basin with an outflow pipe placed at or just below the point where the water comes to the surface.

While water sources may differ in water quality, it is how water is handled and stored by consumers that will finally determine whether the water is safe for drinking. Studies have shown that dipping hands into household storage buckets causes considerable contamination and that water quality declines over time after the water is initially collected. The best way to keep water safe in the household is to add a chlorine residual to the water (see the next section on water treatment for details on chlorine residuals). This means that in unsanitary settings or during times of outbreaks, it might be necessary to chlorinate otherwise safe groundwater. Additional measures for keeping water safe include hauling it in only clean containers and using only containers with narrow-neck openings to prevent hands and other objects from entering the container and contaminating the water. In addition, containers used for storing water at the household should be covered and have narrow-neck openings.

Treatment options by source type

Treatment of water supplies retrieved by buckets and through piped distribution systems is discussed below.

Bucket collection

When people collect water directly from water sources in buckets, the only treatment that can be done easily is chlorination. Health workers or volunteers can chlorinate water at the point of collection or in the home. Ideally, enough chlorine should be added to the bucket so that after thirty minutes there is still at least 1.0 mg/l of free chlorine in the water. Typically, an initial dose of 2.5 mg/l of chlorine will be sufficient to react with the organic material in the water and leave an adequate level of chlorine residual. Free residual chlorine is the hypochlorite ion form of chlorine that is lethal to most bacteria and viruses. People should wait for thirty minutes after chlorination before consuming the treated water in order to allow disinfection to occur.

Pipe distributions

Drawing water from a surface water source and distributing it through a piped system can dramatically improve its quality. Generally, three steps should be taken to purify water at surface water plants and to ensure it remains safe until it reaches the consumer:

▪ Settling removes solids (through sedimentation) and protozoa e.g. giardia. Purification is often speeded up by adding coagulants such as aluminium sulphate (alum) and flocculation which is gentle stirring to encourage the formation and settling of heavy colloidal particles called flocs;

▪ Filtering through sand removes particulate matter including microbes (e.g. bacteria, amoeba);

▪ Disinfecting with chlorine deactivates all major water-borne bacteria.

▪ Within a piped system, chlorine levels are typically adjusted to ensure that 0.2 to 0.5 mg/l of free chlorine is in the water at the tap level where it is consumed. For systems with many breaks along the distribution pipes or during times of diarrhoea outbreaks, aim at having 0.5 to 1.0 mg/l of free chlorine. Attendants for water treatment plants can be trained to perform a simple test for free chlorine levels by using a pocket size chloroscope (chlorine comparator kit). Note that although boiling of water is the surest method of water sterilisation, it is not appropriate for large-scale water treatment because about one kilogramme of wood is needed to boil one litre of water.

Removing solids by coagulation and filtration greatly improves the chlorine's effectiveness. Therefore, these three measures are not simply multiple barriers, but when combined produce a synergistic effect on water quality.

It is not enough to focus on water treatment methods because shortcomings in the distribution system are the main cause of major water-borne outbreaks. Sometimes piped water systems break down. The resulting drop in pressure allows contaminants to get into pipes through cracks, which during times of constant pressure only allow water to seep outward. The process of drawing contaminated water into potable water pipes is called cross-contamination. During times of armed conflict, electrical outages, explosions and the inability to conduct routine maintenance make the problem of cross-contamination particularly serious. Two things can be done to prevent this process:

- Increase the pressure in the water pipes by increasing the rate of pumping into the system, by cutting down on water waste, or by closing off sections of the distribution system;

- Increase the level of residual chlorine because cross-contamination occurs sporadically along the distribution system. The level of chlorine residual must be kept high throughout the entire pipe network. Levels of residual chlorine should be increased until there is free chlorine virtually everywhere (at least 95% of locations).

Box 8-14: Disinfection of hand pump and piped distribution schemes

At the emergency's on-set, future disinfection needs must be an important factor in planning water system projects in camps and settlements. In the long-term, disinfection of water supplies might be required to protect against outbreaks or in response to actual outbreaks. Although water sources might be of good quality, disinfection will be needed to protect the quality of water during transport and storage to the household.

Two options for water supply systems in camps and settlements are piped distribution systems and hand pump schemes. For piped distribution systems which might include a motorised well pump, storage facilities, distribution pipes and tap stands to deliver water, disinfection is typically straightforward. With proper training, a single water attendant can effectively chlorinate several systems in a camp or settlement. Appropriate concentrations of chlorine are mixed with water in the storage tank and a one-hour contact time is allowed before valves are opened allowing water to flow to tap stands.

Compared to a pipe distribution system, disinfecting water from hand pumps has several disadvantages. First, hand pumps must be disinfected, one jerry can or container at time by attendants placed at each hand pump. Chlorination of hand pumps is very labour-intensive and costly if community volunteers are unavailable. Water attendants also must be present at all times when the hand pump is operational to ensure that all water supplied from them are chlorinated. Finally, people might or might not allow one hour of chlorination water contact time before using the water.

For these reasons, pipes systems are more appropriate from a disinfection viewpoint over hand pump schemes in large camps and settlements when the disinfection of water supplies is highly anticipated.

Chlorination

Groundwater from wells and springs is usually safe for drinking without chlorination., When household water contamination is high or when the groundwater is of poor quality however, water disinfection might be necessary. As with surface water, buckets can either be chlorinated as the water is collected or people can be equipped to treat the water at home. Many agencies have chlorinated wells as a public health measure. This is done by shock chlorination and pot chlorination.

Shock chlorination: Shock chlorination is conducted by adding 20ml of 1% of chlorine solution for each litre of water in a well and allowing it to sit unused for a number of hours.[35] The first water drawn from the well after the disinfection period is discarded. Normal use of the well can then be resumed. Shock chlorination does not mean that the water given to people for their homes is chlorinated. After the first few hours of use after treatment, there will be little or no residual chlorine in the drawn water. Shock chlorination can eliminate a temporary threat to water quality of a well, e.g. in newly dug wells or for groundwater that has been contaminated by people or an unusual event (such as a major rainstorm).

Pot chlorination: The chlorination pot is usually a vessel, such as a one litre plastic bottle with a few holes punched in it. This vessel is filled with a chlorine powder and gravel mixture and placed in a larger vessel (such as a four litre milk jug or a clay pot) which also has a few holes punched in it. The chlorine disperses from the double-layered pot slowly. The number and size of holes determines the dose of chlorine released into the well. The pot chlorination method protects against a continuous source of contamination in the groundwater. It also counteracts any new contamination in the well, and provides a protective chlorine residual in the water that people use. Unfortunately, operating this type of system effectively needs extensive monitoring. The ideal target dose of free chlorine in water drawn from a well is 0.5 to 1.0 mg/l. The number and size of holes in the vessels must be tailored to match a specific well volume and withdrawal rate. The first water drawn in the morning will have an offensively high level of chlorine. If a well has certain periods of very high use, the dose might become too low. Therefore, the pot chlorination method is not widely used. This method is particularly unsuitable during the acute phase of a crisis when lack of time and attention can prevent proper monitoring and adjustment of the chlorine levels.

Hygiene
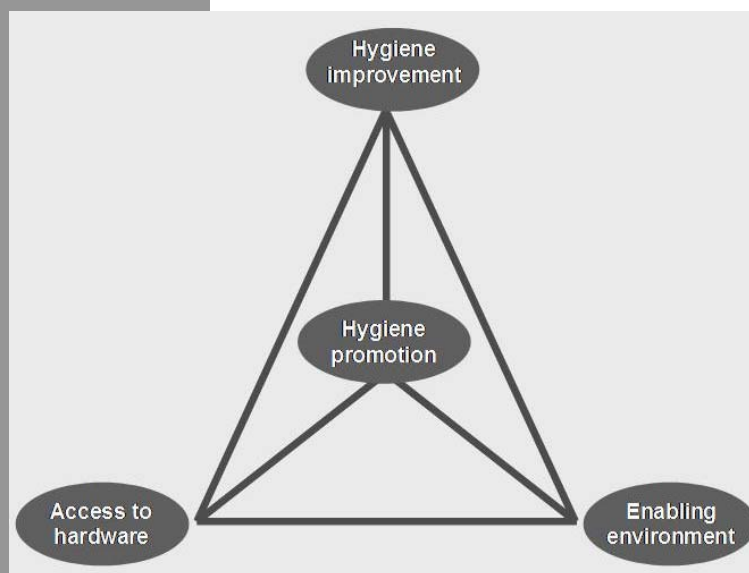
In previous sections, we discussed the importance of improving water and excreta disposal facilities in emergencies settings. Poor hygiene can contribute to excessive maternal and neonatal death and other diseases. Constructing hygiene facilities and making them available does not guarantee they will be used or that they will be used properly. Hygiene promotion tries to ensure that people gain the greatest health benefits possible from these facilities through the proper use and maintenance of the facilities and by improving hygiene practices.

Hygiene Promotion is the planned, systematic attempt enabling people to take action to prevent or mitigate water and sanitation related diseases. It also provides a practical way to facilitate community participation and accountability in emergencies. It involves ensuring that optimal use is made of the water, sanitation and hygiene enabling facilities provided. Previous experience shows that facilities are frequently not used in an effective and sustainable manner unless hygiene promotion is carried out. Access to hardware combined with an enabling environment and hygiene promotion make for hygiene improvement.[34]

Hygiene promotion encourages healthy choices in life, a healthy way of life. It is important to understand what motivates people to make healthy choices and what motivates them to change their behaviour. In fact, a desire for good health is often not the

primary motivating factor for change. Instead, other factors such as convenience, social status, the esteem of others and financial gain might be the driving forces behind change.

It is important to explain several the commonly used terms.

Health promotion aims at preventing disease and promoting positive health by enabling people to have increased control over their physical, mental and social well being.

Hygiene promotion is a part of health promotion, but also focuses on the prevention of water and sanitation related diseases. Hygiene promotion seeks to understand and build upon existing knowledge, practices and resources in the community. The goal of hygiene promotion is for people to develop safe hygiene practices. From a participatory viewpoint, hygiene promotion focuses on people identifying their own hygiene practices and behaviours and developing ways to improve them and reduce their risk to disease.

Hygiene education is the teaching of hygiene information. For example, hygiene education can include information about how disease is spread and how people can stop this spread. This message-based approach to disease prevention might be appropriate in certain circumstances e.g. when people want this type of information, but this type of approach does not generally lead to positive behaviour change. Successful hygiene promotion programmes use broader types of approach including social marketing, participatory learning and peer influence.

Standards and key indicators for hygiene promotion

The following is the minimum standard for the design and implementation of hygiene promotion programme:[24]

- All facilities and resources provided reflect the vulnerabilities, needs and preferences of the affected population. Users are involved in the management and maintenance of hygiene facilities where appropriate.

Key indicators for hygiene promotion and for personal hygiene have been established to help measure progress toward this standard (Box 8-15 and Box 8-16).

Box 8-15: Key indicators for hygiene promotion[24]

- Key hygiene risks of public health importance are identified.

- Programmes include an effective mechanism for representative and participatory input from all users, including in the initial design of facilities.

- All groups within the population have equitable access to the resources and facilities must continue to achieve the hygiene practices that are promoted.

- Hygiene promotion messages and activities address key behaviours and misconceptions and target all user groups. Representatives from these groups participate in planning, training, implementation, monitoring and evaluation.

- Users take responsibility for the management and maintenance of facilities as appropriate and different groups contribute equitably.

Box 8-16: Key indicators for personal hygiene[24]

- Each person has access to 250g of bathing soap per month.

- Each person has access to 200g of laundry soap per month.

- Women and girls have sanitary materials for menstruation.

- Infants and children up to two years old have twelve washable nappies or diapers where these are typically used.

- Additional items essential for ensuring personal hygiene, dignity and well-being can be accessed.

Is effective hygiene promotion possible in emergencies?

Hygiene promotion is often seen as too time consuming to implement in an emergency. Many emergencies are also 'hardware driven' meaning that focus is on constructing water supplies and excreta disposal as a first and, perhaps, only priority. Further encouraging this hardware focus is that the water-sanitation sector as a whole might measure success by the number of water systems and latrines installed without including or emphasising hygiene-related indicators in the monitoring process. All these factors contribute to hygiene promotion being too often ignored during emergencies.

However, it is important to note that hygiene promotion can be effective early in an emergency if community mobilisation is made stepwise and integrated in other services. After the first stages Pakistan earthquake 2005, the IFRC and the Pakistan Red Crescent Society introduced hygiene promotion quite early as an integral part of an emergency. Rosenstock, Strecher and Becker show that changes in behaviour can occur rapidly in situations where people feel they are at risk or changes are made to the environment such as setting up convenient hand-washing stations.[34]

Emergencies leave people displaced for years, often many years. Time shortages, are major obstacles to hygiene promotion activities particularly during the first weeks of an emergency. Despite the obstacles however, minimum aspects of hygiene promotion must be established with emergency water supply and excreta disposal facilities. For example, investing in a few participatory sessions about improved hygiene behaviour early in an emergency can provide substantial benefits months and even years later.

Providing disaster-affected populations including vulnerable groups, the opportunity to be actively involved in programmes throughout the project cycle (assessment, design, implementation, monitoring and evaluation) is an important aspect of strengthening people's capacities to deal with emergencies in the long-term and ensure the sustainability of designed structures.

Box 8-17: Hygiene promotion in Uganda during an emergency[32]

During an outbreak of cholera in western Uganda in June 2006, 100 Ugandan Red Cross Society volunteers were mobilised to do assessments and conduct a shortened version of the Participatory Hygiene and Sanitation Transformation programme that reduced the seven steps to three and the time from four months to six weeks. Household visits were done in 5,335 homes and 700,000 people were reached through radio promotions. By the end of the campaign, the death rate due to cholera had dropped from six cases to nil.

Several key principals in hygiene promotion are presented below:[8]

- Target a small number of risk practices. For controlling diarrhoeal disease, the priorities for hygiene behaviour change are likely to include hand washing with soap or a local substitute after contact with stools and the safe disposal of adults' and children's stools.

- Target specific audiences that can include mothers, children, volunteers, teachers, shopkeepers, doctors, nurses, clinic staff, older siblings, fathers, opinion leaders or other groups. Identify who is involved in childcare and who influences them or takes decisions for them.

- Identify the motives for changed behaviour. Motives often have nothing to do with health while behaviour might be driven by disgust, nurture or status. For example, people might be persuaded to wash their hands so that their neighbours will respect them, so that their hands smell nice or because they are caring for a child. People often do not know their own motives; consumer research, therefore, requires patience and skill.

- Hygiene messages need to be positive. People learn best when they laugh and will listen for a long time if they are entertained. Programmes that attempt to frighten their audiences will alienate them. There should, therefore, be no mention of doctors, death or diarrhoea in hygiene promotion programmes.

- Identify appropriate channels of communication. Understand how the target audiences communicate. For example, what proportion listens to the radio, attends schools, social or religious functions or goes to the cinema? Using traditional and existing channels are easier than setting up new ones, but they can only be effective if their nature and capacity to reach people are understood.

- Decide on a cost-effective mix of channels. Several channels giving the same messages can reinforce one another. There is always a trade-off between reach, effectiveness and cost. Mass media reaches many people cheaply, but the messages are soon forgotten. Face-to-face communication can be highly effective in encouraging behaviour change, but tends to be very expensive per capita.

- Allocate enough resources. Marketing professionals have a rule of thumb that at least six contacts with the message (home visits, sightings of a poster, etc.) are needed to introduce a new product or practice and still more to ensure it is sustained.

- Hygiene promotion must be carefully planned, executed, monitored and evaluated. At a minimum, information is required at regular intervals on the outputs (e.g. how many broadcasts, house visits, etc.), and the population coverage achieved (e.g. what proportion of target audiences hear a broadcast). The programme should be integrated with others. Indicators of the impact on the target behaviour must also be collected.

- Use a community approach. To reach more people, consider integrating services with other activities that attract people, such as food distribution, clinics, relief goods distribution, or mobile clinics. Shopkeepers can also be trained to be part of the distribution of soap, Oral Rehydration Salts or other hygiene items.

The two most important practices for hygiene promotion programmes are safe excreta disposal and hand washing with soap after contact with excreta (adult, child or infant).[10]

Hygiene promotion should not just raise awareness, but also empower people to take action:[34]

- People need to be able to clean themselves after defecating. If anal cleansing is done with paper or sticks, these materials must be readily available in or near the latrine. If anal cleansing is done with water or with people's hands, water and soap must be made available at the latrines.

- Hand washing at appropriate times—before cooking, before eating or before feeding children, and after using the latrine or cleaning children—has been shown to be a protective against faecal-oral illnesses.

- Soap provides protection from diarrhoeal illness independent of any educational programme that might accompany it. Therefore, providing soap must be a priority where diarrhoeal diseases are likely to occur.

- Promotional messages should be short and focused. All messages and pictures in a promotional campaign must promote ways that are known to prevent the specific health threat at hand.

Hygiene promotion should engage and be concerned with all subsets of society including community leaders, women, clinics, children (schools and child spaces), men (men's groups) and workers (work environments). Hygiene promotion should seek to improve the use and maintenance of facilities and improve hygiene practices throughout the camp or settlement and into neighbourhoods of the host-population. Certain groups within society might need additional supplies of bathing and laundry soap. For example, people with incontinence problems i.e. difficulty holding urine, mobility disabilities such as the elderly or disabled, those living with HIV/AIDS and associated diarrhoea should be given additional quantities of bathing and laundry soap to meet their special needs. The need for non-food items should be carefully assessed and appropriate materials purchased locally and distributed in a manner that community members feel comfortable with.[33]

Children hold a special place in hygiene promotion as both a target group and as a vehicle to lasting change. Children are a target group because those aged under five are highly vulnerable to diseases resulting from poor water and sanitation. As a vehicle to lasting change, children who learn and practice good hygiene habits often keep these good habits into adulthood and pass them to their own children and they often positively influence their parents, too.

Approaches to hygiene promotion

Before discussing ways of promoting behaviour change, it is important to understand a number of fallacies or untruths related to hygiene promotion (Box 8-18). It must be recognised that changing behaviour is not easy and that information alone is generally not enough to produce positive behaviour change. Outside experts must also design hygiene promotion programmes, which, however, must be designed with expertise and input from the community. Behaviour change should focus on a few specific hygiene practices that might be contributing to disease spread rather than many practices. Finally, for hygiene promotion programmes to be successful, adequate financial and personnel investments must be made.

Box 8-18: Five fallacies about hygiene promotion[8]

- Fallacy No. 1: Behaviour change is easy.
- Getting people to change the habits of a lifetime is difficult, takes time and requires resources and skill.
- Fallacy No. 2: Knowledge change=behaviour change.
- It was thought that education about hygiene would be enough for people to change their behaviour. However, many people already know about germs, but still do not wash their hands. Change might be too expensive, time-consuming or there might be discouragement from other members in society.
- Fallacy No. 3: Experts know how to change behaviour.
- Hygiene promotion programmes cannot be designed by experts in an office. They have to de designed around the real needs, wants and contexts of the actors themselves i.e. by taking a consumer-centred approach. On the other hand, hygiene promotion programmes cannot be designed by communities themselves. Outside expertise is also needed.
- Fallacy No. 4: A whole variety of hygiene practices should be encouraged.
- Only a limited number of unhygienic practices are likely to be responsible for most diarrhoeal episodes. Since behaviour change is difficult, efforts should not be diluted by targeting too many practises.
- Fallacy No. 5: Hygiene promotion is a cheap add-on to water programmes.
- Serious efforts to change behaviour require serious investment and professional skill. Hygiene promotion needs careful planning and the best solutions might, or might not dovetail well with water and sanitation activities.

This chapter will discuss two types of approaches to learning and behaviour change. One type is a didactic or directive approach to learning; it involves giving information to the learner perhaps in a classroom setting or through public messages. Such messages can be linked with preventive measures such as latrine construction and use, chlorination of water, soap distribution, etc. A drawback to this type of learning is that it does not encourage learners to develop problem-solving skills.

Participatory methods, on the other hand, encourage the development of problem-solving skills. Participatory approaches are also called learner-centred approaches because they encourage people to express their ideas freely about understanding and solving problems. Some people might resist freely expressing themselves in participatory ways. Some people, particularly women, might not be confident about their ideas particularly if they

are not used to freely expressing them. Some people might want to avoid conflict with others and others might feel that their opinion will never make a difference. Despite these obstacles, participatory methods can produce great enthusiasm and involvement the more they are used and the more facilitators allow participants to direct and shape their own learning and exploration.[10]

Under some circumstances, didactic approaches are best to use and in other situations, participatory methods or a combination of both might be more suitable. Whether didactic or participatory methods or a combination of the two are used depends on each particular situation. For example, during the acute emergency phase or during an outbreak, it is critical to disseminate basic health information to the entire community as quickly as possible. Such information might include how disease is spread, early signs of possible infection and danger signs for seeking immediate medical attention particularly for children. During such circumstances, participatory methods might not seem appropriate because of the time investment needed. While time constraints are an important factor, engaging participatory methods can lead to lasting changes and, therefore, efforts should be made to use these methods wherever possible.

Box 8-19: Environmental promotion in El Salvador

In 2002, UNICEF El Salvador with the ministries of health, education and the environment as well as national and international NGOs and private sector met in a consortium to organise an environmental campaign called 'Re-encuentro con el Rio Lempa' which translates as 'Let's Do a Reconciliation with the Lempa River'. The campaign's aim was to give the population of El Salvador environmental and hygiene messages in an original way about understanding what a great resource the Lempa River was for El Salvador and how important it was to take care of it to ensure a healthy environment for the children of El Salvador. The campaign's strategy was to work at different levels sending environmental messages to children, adolescents and adults to create a space where all generations could join together to think about water related issues in El Salvador. The main components of the campaign were:

- Rafting the river—a twenty day navigation and rafting trip on the river to discover the wonderful natural areas, the fauna and flora, the hydroelectric power, the dams and water treatment facilities, and water for agriculture;

- Competition of environment and sanitation songs—schools, private radios and TV programmes for children helped the consortium to advertise the competitions through songs for children. Hundreds of songs were submitted. The best ten were recorded and sent to all schools in El Salvador to raise awareness about hygiene and environmental promotion;

- Selecting an environmental mascot and publications—a 'tengereche' was selected to be the environmental symbol of El Salvador. Publications were also made about the flora and fauna of El Salvador and distributed to schools.

The campaign was very successful and was repeated over the following years. The songs were broadcast repeatedly, becoming very familiar throughout the country. Eco-tourist activities were also developed along the River Lempa. Finally, children learned what a precious element in

Food safety

Food-borne diseases are spread through eating food. Diarrhoeal diseases including cholera and dysentery are among food-borne diseases. This section focuses on food safety at the household level and highlights the best practices that avoid illness when storing, preparing and consuming food.

Standards and key indicators for food safety

The following is the minimum standard for ensuring food safety:[24]

- Food is stored, prepared and consumed in a safe and appropriate manner at both household and community levels.

To help measure progress toward this standard, key indicators corresponding to this standard are presented in Box 8-20.

Box 8-20: Key Indicators for food safety[24]

- Food is stored and distributed so that it is protected at all times from contamination by vectors such as flies, insects and rodents;
- Milk products are properly distributed;
- There are no adverse health effects resulting from inappropriate food handling or preparation at any distribution site;
- Recipients of food aid are informed about and understand the importance of food hygiene;
- There are no complaints about difficulties in storing, preparing, cooking or consuming the food distributed;
- Every household has access to appropriate cooking utensils, fuel and hygiene materials;
- Individuals who either cannot prepare food or feed themselves have access to a carer to prepare appropriate food in a timely manner and administer feeding when necessary;
- Where food is distributed in cooked form, staff has received training in safe storage, the handling of commodities, the preparation of food and understand the potential health hazards caused by improper practices.

Ensuring food safety

The five keys to safer food are:
- Keeping clean;
- Separate raw and cooked food;
- Cook thoroughly;
- Keep food at safe temperatures; and
- Use safe water and raw materials.

Table 8-8 provides more details about each of these aspects of food safety (WHO, Five Keys to Safer Food).

Table 8-8: WHO five keys to safer food

Indicator	Description	Purpose
Keep clean	▪ Washing your hands before handling food and often during food preparation; ▪ Washing your hands after using the toilet; ▪ Wash and sanitise all surfaces and equipment used for food preparation; ▪ Protect kitchen areas and food from insects, pests and other animals	While most microorganisms do not cause disease, danger microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards. The slightest contact can transfer microorganisms to food and cause food-borne diseases.

Indicator	Description	Purpose
Separate raw and cooked	▪ Separate raw meat, poultry and seafood from other foods; ▪ Use separate equipment and utensils such as knives and cutting boards for handling raw foods; ▪ Store food in containers to avoid contact between raw and prepared foods	Raw food, especially meat, poultry and seafood and their juices might contain dangerous microorganisms that are transferred onto other foods during food preparation and storage.
Cook thoroughly	▪ Cook food thoroughly, especially meat, poultry, eggs and seafood; ▪ Bring foods like soups and stews to boiling to make sure that they have reached 70ºC. For meat and poultry, make sure that juices are clear, not pink; ▪ Reheat cooked food thoroughly.	Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food at a temperature of 70ºC can help ensure that it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.
Keep food at safe temperatures	▪ Do not leave cook food at room temperature for more than two hours ▪ Refrigerate promptly all cooked and perishable food (preferably below 5ºC); ▪ Keep cooked food piping hot (more than 60ºC) prior to serving; ▪ Do not store food too long even in the refrigerator; ▪ Do not thaw frozen food at room temperature;	Microorganisms can multiply very quickly if food is stored at room temperature. Temperatures below 5ºC or above 60ºC slows down or stops the growth of microorganisms; but some dangerous microorganisms still grow below 5ºC.
Use safe water and raw materials	▪ Use safe water or treat it to make it safe; ▪ Choose foods processed for safety, such as pasteurised milk; ▪ Wash fruit and vegetables, especially when eaten raw; ▪ Do not use food beyond its expiry date.	Raw materials including water and ice can be contaminated with dangerous microorganisms and chemicals. Toxic chemicals can form in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling can reduce risk.

In addition, rules for the safe preparation of food to prevent cholera can be found in the water and sanitation in choler outbreak response section of this chapter.

Vector control

This section focuses on important public health vectors in emergencies such as mosquitoes, non-biting flies, biting flies, lice mites, fleas and rodents. This section provides a brief overview of vector control in emergencies. For additional details about the transmission and control of vector-borne diseases, see 'Malaria Control in Complex Emergencies, An Inter-Agency Field Handbook,[22] 'Emergency Vector Control Using Chemicals'[21] and 'Vector and Pest Control in Refugee Situations'.[27]

Standards and key indicators for vector control

The following minimum standards for vector control include protecting the individual, family and environmental levels and address issues related to the safe use of chemicals:[24]

8

Water, sanitation and hygiene in emergencies

- All disaster-affected people have the knowledge and means to protect themselves from disease and nuisance vectors that are likely to represent a significant risk to health or well-being;
- The number of disease vectors that pose a risk to people's health and nuisance vectors that pose a risk to people's well-being are kept at an acceptable level;
- Chemical vector control measures are carried out in a manner that ensures that staff, the people affected by the disaster and the local environment are adequately protected and avoid creating resistance to the substances used.

To help measure progress toward these standards, key indicators corresponding to them are presented in Box 8-21 through Box 8-23.

Box 8-21: Key indicators for vector control for individual and family protection[24]

- All populations at risk from vector-born disease must understand the modes of transmission and the possible methods of prevention;
- All populations have access to shelters that do not harbour or encourage a vector population growth and are protected by appropriate vector control measures;
- People avoid exposure to mosquitoes during peak biting times by using all non-harmful means available to them. Special attention must be paid to protect high-risk groups such as pregnant women, feeding mothers, babies, infants, older people and the sick;
- People with treated mosquito nets must be used effectively;
- Control of human body lice must be carried out where louse-borne typhus or relapsing fever is a threat;
- Bedding and clothing are aired and washed regularly.

Box 8-22: Key indicators for vector control for physical, environmental and chemical protection[24]

- Displaced individuals are settled in locations that minimise their exposure to mosquitoes;
- Vector breeding and resting sites are modified where practicable;
- Intensive fly control is carried out in high-density settlements when there is a risk or the presence of diarrhoea epidemic;
- The population density of mosquitoes is kept low enough to avoid the risk of excessive transmission levels and infection;
- People infected with malaria are diagnosed early and receive treatment.

Box 8-23: Key indicators for vector control for chemical control safety[24]

- Personnel are protected by the provision of training, protective clothing, use of bathing facilities, supervision and a restriction on the number of hours spend handling chemicals;
- The choice, quality, transport and storage of chemicals used for vector control, the application equipment and the disposal of the substances must follow international norms, and can be accounted for at all times;
- Communities are informed about the potential risks of the substances used in chemical vector control and about the schedule for application. Communities must be protected during and after the application of poisons or pesticides according to internationally agreed procedures.

Risk factors for vector-borne diseases

Displaced populations are often at an increased risk of vector-borne diseases. Assessments must be made to understand the risk of vector-borne diseases and pest nuisance. They help decide if settlement sites should be accepted or rejected and also guide appropriate control and preventive measures. Assessments must address the presence of the vector, the prevalence of the disease organism and the susceptibility of the population. Factors that make displaced populations more susceptible to vector-borne diseases include immunity and disease status, increased exposure to vectors increased

number of breeding sites, the temporary nature of the camp site, reduced domestic hygiene, interruption of vector control measures and access to treatment.

Immunity and disease status

Stress, poor nutrition, multiple infections and the lack of previous exposure to the disease will lower a population's immunity to vector-borne diseases. This is especially true for malaria when a non-immune population or a population immune to a different type of malaria parasite has moved from urban or highland areas to lowland areas that are warmer or wetter. In urban or highland areas, there might be very little exposure to malaria whereas warmer climates have an increased chance for the disease to be transmitted. When the weather is wetter than where the non-immune population came from, the vector populations increase rapidly. A displaced population can also transfer certain parasites and diseases from its old to its new location where they multiply and spread. This makes the vectors and humans at the new location susceptible to diseases they would not normally be subjected to.

Increased exposure to vectors

Displaced populations can be more exposed to vectors because of overcrowding and poor housing. Overcrowding makes it easier for lice and mites to spread from person to person. It also increases the chance that there is an infectious human; that is a person with perhaps circulating yellow fever virus and a non-immune susceptible host are both living within the fifty-metre flight range of the *Aedes* mosquito that transmits yellow fever as well as Dengue and chikungunya fevers. Poor or no housing can also result in closer contact with sand fly, leishmaniasis, flea vectors of rodent-borne diseases or tick-borne relapsing fever.

Increased number of breeding sites

Mosquito populations need water to reproduce. There might be an increased number of breeding sites because of either more pools of water or more domestic water containers. This can significantly increase the incidence of mosquito-borne diseases. More water-storage containers increase breeding of the Dengue fever vector *Aedes*. More water-filled pit latrines increase breeding of the encephalitis vector *Culex* mosquitoes. More groundwater pits, ponds and even footprints increase breeding of the malaria vector, *Anopheles* mosquito. While evacuation sites, newly established camps and settlements can have severe problems with flies, lice, mosquitoes, rodent populations usually take some time to build up, however. Poor food storage or disposal will increase the rodent population. Rodents bring fleas and therefore the possibility of diseases. Flies are attracted to areas with food and wastewater disposal problems especially around feeding centres. Fly problems are often severe at the very beginning of the camp before sanitation systems can be established. Natural disasters (e.g. floods) may change the environment and increase the breeding sites of other vectors of less urgent concern, e.g. ticks, tsetse flies etc. resulting in rarer disease outbreaks including viral haemorrhagic fevers.

Temporary nature of the camp site and reduced domestic hygiene

The temporary nature of a refugee camp means that it is not intended to be 'home' for long. Displaced populations might not care as much about protecting themselves or their household from vectors or pests as they normally would. They might be too worried about the stress arising from their situation, such as the lack of resources, to be concerned about a few mosquito bites or accumulation of refuse. With the disturbed community structure and huge numbers of new neighbours, it can be difficult to develop a 'community responsibility' for sanitation.

Interruption of vector control measures

In emergencies, vector control programmes might lack the resources to support the control measures (chemicals may be too costly). As a result, epidemics of vector-borne diseases may occur once routine vector control measures (e.g. insecticide spraying) and health care services are disrupted.

Access to basic treatment

Epidemics can occur amongst the vulnerable displaced as well as the host populations in complex emergencies due to poor access to effective treatment. In complex emergencies, a general breakdown of the health infrastructure is common and is possibly compounded its gradual deterioration over many years. In the case of displaced populations, health services often become overwhelmed and many cases simply go undetected and untreated.

Common vectors in emergencies

Common vectors in emergencies include mosquitoes, non-biting flies, biting flies, lice mites, fleas and rodents. Bed bugs, ticks, snails are also other problematic medical vectors that will also be briefly discussed in this section.

Mosquitoes

Many different species of mosquitoes live in specific but different habitats from each other and each is capable of transmitting a variety of diseases. Fortunately, just a few mosquito species need to be studied to determine the most essential vector control measures. This section focuses on three types of mosquitoes:

▪ *Anopheles* mosquito is a vector for malaria and filariasis;

▪ *Aedes* mosquito is a vector for yellow fever, Dengue and Chikungunya;

▪ *Culex* mosquito is a 'nuisance' vector that also transmits filariasis and the encephalitis virus, but is generally not a critical vector control issue in complex emergencies.

Box 8-24: Summary of mosquito life cycle

All mosquitoes go through the same life cycle: egg, larval stage, pupa stage, and adult.

▪ The duration of each stage depends on the temperature. Generally, it takes ten days for mosquitoes to develop from egg to adult. The egg stage lasts about two days, and then goes through four larval stages in six to seven days followed by the pupa stage lasting one or two days;

▪ The male and female adults emerge from the pupae. Female mosquitoes have antennae that are thinly scattered across their bodies, while the males have bushy antenna;

▪ The male mosquito will mate with two or three females, drink plant juices (males cannot bite or take blood meals), then die after just a few days;

▪ The female will mate only once in her life and store the sperm in a special sac to fertilise every batch of eggs that she produces;

▪ After mating, the female will seek for a source of blood to give as protein for her eggs, feeding on humans, animals and sometimes both until she is engorged. She will then rest for two or three days as the eggs develop;

▪ The female will fly to oviposit her eggs. She seek another blood meal, engorge herself, rest for two days, oviposit her eggs again. Generally, a female mosquito lives for one or two weeks. Her entire adult stage is spent undergoing this feed-engorge-oviposit cycle up to seven or more times. Each bite is an opportunity to infect a victim.

Note: Oviposit means 'to lay eggs through an ovipositor.' An ovipositor is a tubular structure extending outside the mosquitoes abdomen.

It is important to understand the differences among mosquito species when planning a mosquito control programme. The three species, *Anopheles*, *Aedes*, and *Culex*, can easily be distinguished from each other as shown in Table 8-9.

Note that *Aedes aegypti* glue their eggs just above the water surface on the sides of containers where they can remain dry for six months. The next time the container is filled with water, the eggs are flooded and two days later the larvae hatch out of the egg.

Table 8-9: Characteristics and ecology of different mosquito species

Feature	Anopheles	Aedes	Culex
Species of Public Health Importance	Anopheles gambiae, Anopheles funestus	Aedes aegypti	Culex quinquefasciatus
Egg deposit	Deposit individual eggs on water surface	Deposit individual eggs inside containers just above water surface*	Deposit eggs in rafts on water surface
Larvae	Larvae rest parallel to water surface	Larvae hang down at an angle, suspended by breathing tubes	Larvae hang down at an angle, suspended by breathing tubes
		Larvae swim in sinuous S-shaped motion	Larvae swim in jerky motion
Adults	Adults have long palps and rest against wall with a straight back	Adults have short palps and rest hunched up against the wall	Adults have short palps and rest hunched up against the wall
Flight range	Short, generally less than 1-2 km	Short, generally less than 1-2 km	Short, generally less than 1-2 km
Biting time	The later hours of the night (11pm-6am)	Rests on hanging clothes in the house and bites during the day	Earlier in the evening just after dusk

Non-biting

The non-biting flies of public health importance in emergencies are the synanthrophic flies: house fly, blow fly, and flesh fly. These flies usually hover around food, carrion, garbage, human and animal waste. When they land, they might either transfer or carry disease pathogens attached on their legs and other parts of their bodies. These pathogens can be mechanically transported or transferred to humans and animals. Even though they can also be transmitted via fly faeces, pathogens do not undergo biological transformation in the flies. In unhygienic conditions, flies have more opportunities to cause the following:

- Flies of the *Musca* and *Chrysomyia* genera are known mechanical vectors of intestinal infections such as dysentery and typhoid;
- Flies can transmit polio and certain eye infections such as trachoma;
- Large fly populations can be extremely bothersome to human comfort.

Note that flies are not usually associated with cholera. A larger dose of cholera bacteria is required for cholera transmission than the flies can carry.

There are four stages in the fly life cycle:

- Egg;
- Larvae (or maggot);
- Pupa; and
- Adult (see illustration below).

A single female house fly, *Musca domestica*, can lay up to 2,000 eggs a month. Eggs are deposited in various habitats, especially in garbage and human and animal wastes. Depending on the temperature, the life cycle may extend anywhere from six days to six weeks before the adult emerges. As enormously dense fly population can thus develop in

a short period. In warmer climates, the adult fly can live for only two to three weeks whereas they can live up to three months in cooler climates.

Fly control must identify and eliminate flies' breeding sites. The main breeding sites of the non-biting fly species are listed in Table 8-10.

Table 8-10: Breeding sites of non-biting fly species

Common name	Scientific name	Breeding sites common name
House fly	Musca domestica	Refuse, animal or human faeces House fly
Filth fly	M. sorbens	Human faeces
Bush fly	M. vestutissima	Cattle droppings
Blow fly	Chrysomya spp.	Latrines, meat, fish
Blue bottle, Green Bottle flies	Calliphora spp. Lucilia spp.	Meat, fish and garbage
Flesh fly	Sarcophaga spp.	Meat, animal faeces
Lesser house fly	Fannia spp.	Animal faeces
Stable fly	Stomoxys calcitrans	Straw stacks, piles of weeds, animal faeces

Biting flies

In addition to causing painful bites and sucking blood, some biting flies transmit important diseases:

▪ Tsetse flies are known to transmit sleeping sickness (trypanosomiasis) and must be considered a serious threat to life. Sleeping sickness is 100% fatal without complete treatment, which is often very hard to access in emergencies (costs US $500-1,000, depending on the stage of disease). There are an estimated 250,000 cases in total in just Southern Sudan, Democratic Republic of the Congo and Angola. Refugees can be infected with sleeping sickness in different ecological habitats including forest, scrub and river areas;

▪ Sand flies transmit two types of leishmaniasis: *cutaneous* and *visceral*. Visceral leishmaniasis is fatal and is reported in camps and settlement areas of Southern Sudan.

▪ Black flies are vectors of onchocerciasis or river blindness.

Lice

Among the species of lice that affect the body, head and pubic area, only body lice are vectors of diseases that can cause epidemics. Body and pubic lice transmit disease that can cause irritation and severe itching. Body lice can be found on clothing that is in close contact with the skin. Migrating populations easily transport body lice from their places of origin. Body lice are common among a large population living in unclean, crowded conditions which facilitate the transmission of pathogens for the following diseases:

▪ Epidemic typhus is a highly contagious disease transmitted by contaminated lice faeces that penetrates the skin during scratching;

▪ Relapsing fever can be transmitted by crushed lice penetrating the skin while scratching;

▪ Body lice bites can cause skin irritation leading to various skin infections.

Note that typhus or relapsing fever should be suspected if many cases of 'fever of an unknown origin' do not respond to an anti-malarial treatment.

Mites

Mites commonly cause scabies and other skin infections in displaced populations, particularly children. Mites transmit rural typhus or scrub typhus in Asia and the Pacific. Mites' larvae feed on the skin of humans in areas of the body where clothing is close to the skin. Overcrowding and poor personal hygiene favour the spread of mites within refugee and displaced populations.

Fleas and Rodents

The two most medical important types of fleas are rat fleas and human fleas. Fleas transmit parasitic worms in humans and spread bubonic plague and murine typhus. Rodents and rodent-borne diseases can become serious problems in displaced population camps that have existed for some time. These problems might result from the accumulation of uncontrolled solid waste, which greatly increases rat breeding. Increased rat populations discourage other efforts on environmental health improvement and lead to an increase in diseases transmitted by rats.

- Rats cause disease through their fleas, especially *Xenopsylla cheopis*, which can transmit plague (*Yersinia pestis*) and murine typhus (*Rickettsia mooseri*). Studies in refugee camps in Asia have shown murine typhus to be a major cause of Fever of Unknown Origin;

- Rats spread through their excreta diseases such as salmonelloses, leptospirosis, hanta virus and Lassa fever;

- Rat bites transmit pathogens that cause fever and rabies;

- People can contract leptospirosis from handling the dead bodies of infected rats, or get trichinosis from eating undercooked meat from pigs that have eaten the dead bodies of infected rats;

- The multi-mammate rat (*Mastomys natalensis*) is the natural reservoir of the Lassa fever virus. Outbreaks of Lassa fever have been reported among refugee populations in Sierra Leone and Liberia;

- Finally, rats can cause enormous economic damage by destroying or contaminating food stores and other materials around the house.

Table 8-11 lists the four most important rodent species of concern in emergency settings.

Table 8-11: Four most important rodent species

Common name	Norway rat (Brown or sewer rat)	Roof rat	House mouse	Multi-mammate rat
Rodent species	Rattus norvegicus (Norway rat)	Rattus rattus	Mus musculus	Mastomys natalensis
Appearance	Small eyes and ears, thick tail	Wide ears, pointed snout, long slender tail	Only 1-2 cm wide, smaller head and paws	No more than 25 cm from tip to tip
Weight	Up to 500 g	Up to 250 g	No more than 20 g	Small
Common habitat	Hole in ground, piles of refuse, warehouses, sewers	Under roofs along beams and tops of partitions (excellent climber)	Smaller range: search for food around homes. Attracted to flour, cereals, grain	Less domestic than others
Geographic distribution	Ocean coastal areas of Africa	Throughout Africa except desert and semi-desert areas	Spreading southward from northern Africa	Sub-Saharan Africa

Other vectors of concern in emergencies are given below:

- Ticks are not usually a problem in camp settings. They can, however, transmit Q-fever, hemorrhagic fever and tick-borne relapsing fever;

- Bedbugs can become a great nuisance after displaced population camps and settlements have been established for several months. Bedbug bites cause significant discomfort and loss of sleep. In heavily infested areas, young children may show signs of anaemia;

- Cockroaches contaminate unprotected food and transmit various pathogens including poliomyelitis virus, amoebae and intestinal viruses;

- Snails are intermediary hosts for the schistosoma flukes that cause urinary schistosomiasis and intestinal schistosomiasis.

Options for controlling vectors

Vector control strategies can range from simple treatments (self-protection and home improvement) to more complex measures that require participation from vector control experts. The overall objectives are to reduce reproduction of the vector and personal exposure to the vector. There are three categories of control measures for reducing risk to vector-borne diseases:

- Environmental controls;

- Individual and family protection; and

- Chemicals.

Controlling vectors is a complex problem and often requires an integrated strategy that uses more than one control method. Environmental management is the preferred method of controlling vectors, but in emergencies, insecticides or chemicals are often used because of the risk of outbreaks.

Sound technical expertise is needed for selecting both effective and economically feasible appropriate control measures. With camps and settlements likely to be occupied for years, control measures should reflect the long-term needs for protecting the population from vector-borne diseases. Emergencies can change rapidly; therefore, it is important that needs be reviewed periodically to determine if the control methods previously used are appropriate later.

Vector control intends to lower the number of vectors (density reduction) and the life span of the vector (longevity reduction). Density reduction targets breeding sites and can be achieved through environmental management (e.g. physical elimination of breeding sites such as proper drainage of wastewater) or through insecticide use. Longevity reduction involves the use of chemicals and targets adult vectors. Many factors are involved in the proper selection and use of insecticides. Insecticides must properly target where vectors rest, vectors must be susceptible to the chemical used and the chemical chosen must not be harmful to the sprayers, population or the environment (e.g. drinking water sources). For these reasons, specialised personnel are needed for designing and implementing chemical control measures.

Environmental controls include altering breeding sites by draining or filling sites (see the drainage section), providing excreta disposal facilities (**see excreta disposal section**) and collecting and properly disposing of solid waste (see the solid waste management section). An additional environmental control might be to move camps and settlements away from vector-infested areas.

Individual and family protection includes mosquito nets and curtains, mosquito coils and repellents, regular washing of storage pots, covering water storage containers, keeping latrines clean, using lids or polystyrene beads in latrines, backfilling of full or unused pit latrines, clearing vegetation near dwelling areas which is useful for fly control, but there is no evidence of effectiveness for malaria control. Screens, bed nets, and impregnated plastic sheeting (such as Zero Fly), traps and food covers should also be used.

Chemical use is recommended only after environmental controls have been put into place. Chemical controls include repellents, residual spraying (inside dwellings), larviciding (killing eggs and larvae before reaching adult stage), dusting (mainly for lice and fleas) and space spraying. Space spraying is only recommended on a limited basis. Space spaying should be used when a high density of vectors needed to be eliminated quickly. It is important to note that there is little evidence to show that outdoor space spraying from a vehicle or using a motorised sprayer has any impact on malaria. Space spraying for malaria, therefore, is not recommended. Understanding a vector's resistance to insecticides is critical for ensuring that the most appropriate chemical is used.

Each emergency is different and requires different vector-control options. A vector control measure that is appropriate for one disease might not be appropriate for another. Vector control experts (national and international) should be consulted for advice about the most appropriate vector control measures and chemicals to use. All measures should be based on the national and international protocols. Box 8-25 lists criteria for selecting the most suitable vector control measure.

Box 8-25: Criteria for selecting vector control measures

Criteria for selecting vector control measures
- Type of diseases present;
- Burden of vector-borne diseases on the community;
- Disease risk factors;
- Appropriate for controlling the specific vector species, given the vector's breeding, flight and resting behaviour;
- Simple to understand and apply;
- Affordable and based on locally available resources (equipment, consumable supplies and technical skills);
- Acceptable and compatible with local customs and practices;
- Safe for the user, the population and the environment.

Box 8-26: Advantages of environmental management over chemical use[28]

The advantages of environmental management over chemical use are:
- No problems of chemical resistance;
- No risk of intoxication or environmental contamination from the inappropriate management of chemicals;
- Often longer lasting and contribute to vulnerability reduction and improvements in public health.

Environmental management is not necessarily cheaper than control with chemicals and seldom provides 'quick fixes'. To be successful, environmental management needs good cooperation with other sectors (public works, agriculture, water supply and sanitation).

Mosquito control

Control of mosquito populations depends on the mosquito species. This guide focuses on three mosquitoes species: *Anopheles*, *Aedes* and *Culex*. Table 8-12 summarises breeding site and disease information for these mosquitoes.

Table 8-12: Behaviour of mosquitoes and diseases they transmit[21]

Genus	Breeding site	Place found	Disease and distribution
Anopheline mosquitoes ophelines breed in on polluted water Biting period: NIGHT	Edges of rivers, swamps, impoundments, ditches, tanks, saltwater habitats protected from wave action, rice fields, temporary rain pools, hoof prints.	Worldwide	▪ Malaria: Tropical and subtropical areas ▪ Bancroftian filariasis: Asia and Africa ▪ Brugian filariasis: Asia ▪ O'nyong nyong virus: Africa
Aedes mosquitoes One species lives in close association with man, in any kind of human settlement. The A. aegypti breeds in any small water collection. Aedes spp. are primarily forest mosquitoes. Biting period: DAY	Tin cans, plastics, car tires, gutters, ornamental ponds, tanks, jars, any type of container, waste disposal areas, tree holes.	Worldwide	▪ Yellow fever: Africa and Americas ▪ Dengue: Africa, Americas, Asia ▪ Dengue Haemorrhagic fever, Americas, Asia ▪ Bancroftian filariasis: Pacific ▪ Chikungunya ▪ Other arbovirus: Africa, Americas, Asia
Culex mosquitoes *C. quinquefasciatus* breeds in dirty water in urban and rural areas. Other species are also very common in rice fields in Asia. Biting period: NIGHT	C. quinquefasciatus Waste water ditches, latrines, septic pits, cesspools, drains, waste disposal.	Worldwide	▪ Bancroftian filariasis: Most tropical areas ▪ Encephalitis virus: Africa, Americas, Asia, Europe
Mansonia mosquitoes Mainly associated with aquatic plants in rural areas with irrigation canals. Biting period: NIGHT It is a vicious biter	Ditches, ponds, irrigation canals, swamps.	Essentially tropical Worldwide	▪ Brugian filariasis: Asia ▪ Other arbovirus: Rare in Africa and Americas

The strategies for controlling the *Anopheles* mosquito at its source include site selection, environmental controls and chemical controls.

▪ Site Selection: From a malaria control perspective, any camp or settlement should be located one to two kilometres upwind from potential vector breeding sites (some natural water sources) whenever an additional clean water source (pumps, tanks, or capped wells) can be provided for the camp population. In this case, they have less direct need to be sited close to natural water sources;

▪ Environmental control: If there is only a few *Anopheles* temporary breeding sites, larval control is possible through draining or applying larvicide. In most rural situations in Africa however, larval control for malaria prevention is not usually practical because common vectors breed in a variety of water sources. *Anopheles gambiae* breeds in temporary water bodies without vegetation and in open sunlight, where as *Anopheles funestus* breeds in permanent water bodies with vegetation including ponds and swamps.

▪ Chemical control: If larvicide is to be effective, all breeding sites contributing to the *Anopheles* mosquito population must be targeted. There are two main larvicides that

can be safely applied on drinking or bathing water: temephos and *bacillus thuringiensis* H-14 (BTI). Temephos (an organophosphate insecticide better known as Abate®) is widely used to control Dengue, onchocerciasis and guinea worm. Temephos is effective and safe to drink at a concentration of 1 part per million. *Bacillus thuringiensis* H-14 (BTI) is a biological insecticide and is specifically toxic to mosquitoes and black flies. BTI is costly and has a short residual action requiring weekly re-treatment. Note that because pyrethroid insecticides are toxic to fish, they are unsuitable for use in breeding places.

The most commonly used and effective methods for blocking the transmission of malaria by *Anopheles* mosquitoes are Indoor Residual Spraying (IRS) within the inside surfaces of dwellings and Insecticide Treated Mosquito Nets (ITNs) and Materials (ITMs).

▪ IRS involves spraying long lasting insecticide on the walls and ceiling of dwellings to kill adult mosquitoes that land and rest on these surfaces. At least 85% of dwellings must be sprayed for this method to give mass protection across the community. When coverage reaches 85%, mosquito populations decrease and even the people in dwellings that were not sprayed benefit from the lower mosquito populations and, therefore, reduce the risk of malaria. In fact, spraying only a single shelter gives little personal protection since mosquitoes rest on walls after they feed (and after they have potentially transmitted malaria). The timing of IRS is important because to be most effective, spraying should be done just before the start of the malaria season (wherever it is seasonal) and before the peak of the epidemic. Delayed IRS has little impact on malaria control and is a waste of resources. See WHO 'Manual for Indoor Residual Spraying: Application of Residual Sprays for Vector Control' (WHO, 2002) for details about training personnel for IRS;

▪ *Anopheles* mosquitoes tend to bite after sunset and before sunrise, and therefore, night time protection from the mosquito is needed. When used properly, ITNs can provide such protection for not only the person sleeping under the bed net but also others in the same room because less transmission will occur. Both conventional ITNs and Long-Lasting Insecticidal Nets (LLIN) are currently available. Conventional ITNs must be retreated every six to twelve months depending on the persistence of the insecticide used, the frequency of net washing and the seasonality of malaria transmission. For ITNs to provide community-wide vector control benefits, 60% (some studies indicate 50%) coverage is needed. When conventional ITNs are issued, it is important that initial insecticide treatment be performed in the presence of the net users. Experience shows that having users present for the initial insecticide treatments is beneficial for appropriate use and re-treatment. Nets must be distributed with information on proper their use and hanging materials if needed. The long-lasting type of LLIN is preferred in emergencies to avoid the need for treating and re-treatment. These nets are treated with insecticide at the factory when they are made. The result is that they should keep their insecticide activity for up to twenty washings and for three years of field use. WHO has recommended the use of two LLINs, PermaNet® 2.0 and Olyset Net®, for malaria prevention and control.

Aedes mosquitoes transmit yellow fever and Dengue. Remember that *Aedes* mosquitoes are daytime biting mosquitoes that do not rest on walls. Most *Aedes* mosquitoes live close to humans. They typically breed in household water storage containers and other containers holding water. The critical method of control of *Aedes* mosquitoes is eliminating breeding places. Elimination involves the clean-up, bury or disposal of 'non-essential' water containers, old tires, tin cans, broken jars, plastic bottles etc. The prevention of breeding sites includes emptying and cleaning domestic water containers once a week. Since it takes ten days for the mosquito to develop from egg to adult, cleaning and covering the jars once a week will prevent adults from emerging. Containers should be covered to prevent mosquitoes'' access. Because the *Aedes* mosquito prefers to rest on hanging clothing, *neither ITNs nor IRS are effective control measures against Dengue, yellow fever or Chikungunya*. Effective chemical control of *Aedes* mosquitoes includes larvicides and many space spraying programmes using thermal fogs or ultra-low volume insecticides. Space spraying is very expensive, but is necessary during epidemics

and should always be combined with larval control. Insect resistance has been found in *Aedes* mosquitoes; therefore, it is important that any insecticides must be tested for effectiveness. There are also some types of insecticide pellets that can be deposited in small water collections, tins or other sites to deter the *Aedes* mosquito.

Culex mosquitoes rest outdoors more that indoors; therefore, indoor residual spraying is not a suitable option. Bed nets provide relief from the nuisance bites of *Culex* mosquitoes. Larval control is achieved through environmental sanitation, improved latrines and applying insecticides and polystyrene beads on the surface of pit latrines and cesspools.

Non-biting flies

The breeding sites of flies include human and animal excreta, domestic rubbish and other organic matter. Environmental sanitation is the basic measure for fly control. Insecticides should be used only during outbreaks of vector-borne diseases and as a supplement to sanitation. Because flies can develop resistance to insecticides very quickly, chemical control should be used for only a short period of time and only when necessary. Specialised manuals should be consulted before beginning any insecticide applications.

The most important control measure for flies is to ensure that latrines are fly-proof. Measures for making latrines fly proof include providing a water seal or functioning ventilated improved pit latrines or providing covers for simple (non-water seal) types of latrines. In addition, if defecation fields are used in the early stages of an emergency, they should be at least 500 metres down wind from the nearest household and thirty metres from a water source. A second important control measure is to regularly dispose of all garbage. Collect refuse from households and markets as well as from refuse sites at least twice a week to limit the number of flies that reproduce. The final disposal of all refuse should be in covered garbage pits or by burying. Studies show that food scraps from communal feeding centres are often stored in baskets on the ground. This shaded, damp environment with organic matter mixed with mud provides a perfect breeding site for house and bluebottle flies. Finally, dead animals and waste from slaughterhouses must be buried as soon as possible.

Traps and screens can also prevent the spread of disease caused by flies. Large numbers of flies can be caught with non-poisonous traps and screens. A simple trap can be made by cutting off the upper third of a plastic bottle and placing it upside-down inside the lower portion of the bottle, which is half-filled with bait. Ripe mango waste and fish flour mixed with water make excellent bait. The traps are suspended above the ground near breeding sites. Flies entering the trap will not be able to leave and die. The traps become active in two to three days and can last two to four weeks. Traps can be efficient only if well maintained otherwise they become additional breeding sites for flies. poison baits must never be used in refugee camps.

Sticky strings and sticks suspended in latrines and around food preparation areas can help reduce fly populations, but might not be very practical in emergencies. Residual spraying of the inside of pit latrine shelters to control adult insects and using polystyrene beads in the pit latrine fluid to discourage vectors from breeding in the fluid surface are more effective approaches in emergencies. Putting screens on doors and windows might also not be practical in most refugee situations. However, food and utensils can be protected by placing netting over them or keeping them in fly-proof containers or cupboards.

Biting flies

It is important to control biting flies such as tsetse flies and sand flies. Tsetse flies transmit trypanosomiasis or sleeping sickness. Control methods for tsetse flies are directed at adult populations with traps, insecticide treated targets and insecticide spraying. The *biconical trap*, *pyramidal trap* and *vavoua trap* are made up of blue and black cloths and mosquito netting. Flies are attracted to the brightly coloured mosquito netting over the traps and are unable to escape after entering. Traps are cheap, easy to transport, completely safe for the user and very effective means for controlling biting flies. Because these cloths do not require any specific training to use, they are ideal for

use by individuals or communities. Insecticide treated targets consist of impregnated traps and screens, which are more effective since they kill any flies that land on them. They can be impregnated by the same pyrethroids used for impregnating mosquito nets and can be effective for up to three months. Traps attract more flies than screens and require less handling. Screens are much cheaper than traps and cover a larger area. However, traps continue to be effective in catching flies once the insecticide wears out, screens are only effective as long as the insecticide is active. Aerial and ground spraying of insecticides might be the preferred method for controlling tsetse flies during acute epidemics of sleeping sickness. Daytime resting places such as tree trunks, twigs and roots should be targeted. Because of its high cost, special equipment and trained workers, spraying is not recommended as a routine control measure.

Sand flies transmit leishmaniasis, which is a disfiguring and sometimes fatal disease. Visceral leishmaniasis is the most serious form and is fatal if left untreated. Other forms of leishmaniasis cause skin lesions and skin ulcers. The sand fly larvae are located in soil; therefore, control measures for them focuses on adult populations. The infection and spread of leishmaniasis can be controlled through personal protection, residual spraying and the control of animal reservoirs. Personal protection involves avoiding bites by keeping away from areas wherever sand flies breed or rest and by using bed nets, repellents and clothing. Although spraying the interior and exterior sides of doorways and windows and inner walls is effective against sand flies indoors, malaria control is the primary reason for spraying wherever leishmaniasis is a problem. Controlling the animal reservoir population (e.g. rock hyrax in Ethiopia, dogs or other domestic animals) can reduce the incidence of leishmaniasis.

Fleas and rodents

When controlling flea-borne diseases such as plague and murine typhus, rodents should never be tackled before getting rid of the fleas. If not, with the rodents gone, the fleas will still attack humans. Where fleas are a biting nuisance, simple hygiene measures are effective such as taking bedding outside to air in the sun weekly.

There are two effective ways to get rid of fleas: chemical control and rat control. With chemical control, dusting rodent footpaths with insecticide dust or powder is effective for large scale flea control during outbreaks of typhus or plague. When the rats groom themselves, the dust spreads on their fur, thus killing the fleas. Resistance to pyrethroid insecticides is common.

Methods for controlling rodents include mechanical protection and sanitation, traps and poisons. Mechanical protection and sanitation are the only permanent methods for reducing rodent populations in refugee camps. Efforts should be made to store all food in rat-proof containers. The final disposal of solid waste should be done in a location and manner that does not encourage rat breeding or create other environmental health risks. Burial or incineration can be used for final disposal of household waste and refuse from markets and slaughtering areas. Trapping rats is good for publicity, but generally catches only the sick and the stupid. As long as there is enough food and nesting places, the rodent population will grow and quickly reach its former population levels. Rodenticides are generally not recommended in emergency settings. The large number of children, having little to do and few things to play with makes it dangerous to place poison bait traps around the camp environment.

The following is a word of caution about rodent trapping and safe handling of rodents carrying Lassa fever. Lassa fever is common in Sierra Leone and Liberia. The virus is spread through the rat urine. If trapped, these rats have to be disposed of without direct contact between the human and the rat as they urinate wildly and their bodies become covered in the virus. Rodent trapping campaigns could cause outbreaks of Lassa fever if this inadvertently increases host virus contact through normal handling and disposal of the corpse. This might also include safe handling of rodents when dealing with the risk of rabies, especially with live animals.

Controlling other vectors and pests

Vectors and pests of less urgent concern can be controlled through environmental, mechanical, biological, or chemical control, as summarised in Table 8-13.

Table 8-13: Possible vector control measures

Vector	Possible control measures
Lice	mass laundering in hot water; mass delousing with insecticide powder
Mites	mass laundering; supply adequate water for washing and distribute soap for the community
Ticks	clearing vegetation or insecticide spraying is difficult to apply
Bedbugs	household and personal hygiene; insecticide spraying
Black flies	larviciding breeding sites in surrounding rivers
Cockroaches	protect food; insecticide powder or spraying
Snails	sanitation measures, drain water or speed up water flow, spray molluscicides

Table 8-14 provides an overview of vectors, breeding sites and habits and disease and distribution details.

Table 8-14: Vector description and main diseases they transmit[21]

Vector (genus)	Particularity	Breeding sites and habits	Disease and distribution
Tabanid or Horsefly *1. Chrysops*	Very robust Length: 6 to 10 mm	Only the female feeds on any animal. She lays 100 to 1000 eggs, according to species. They breed in moist and wet ground.	▪ Loa loa filariasis: West and Central Africa
Tsetse fly Glossina *Mortisans group* (savannah flies) *Palpalis group* (river bank flies)	Very robust Very long proboscis Wide wings 9 to 25 mm in length	Both males and females suck blood. Tsetse flies are viviparous. They deposit their larvae in damp ground and arid areas.	▪ Sleeping sickness: Africa
Sandfly *Phlebotominae*	Less than 3mm long Very long legs	They are located in the tropics and subtropical areas south of Europe. They breed in moist and wet ground.	▪ Cutaneous and visceral (Kala Azar) Leishmaniasis occur in Sudan, Latin Americas, India, Asia, Middle East, and Southern Europe
Bedbug *Cimex spp.* Reduviid bugs	7mm long Brownish insects Flat and oval body	They live in temperate and tropical zones. They are active only at night where they feed on humans and animals.	▪ Bedbugs cause nuisance such as itchiness: Worldwide ▪ Chagas disease is transmitted by triatomine bugs in South and Central Americas, and in some parts of Caribbean

Vector (genus)	Particularity	Breeding sites and habits	Disease and distribution
Blackfly Simuliidae	Small insect, 1 to 6mm in length	They breed and live in all kinds of unpolluted water, vectors in Africa breed only in fast flowing oxygenated streams or rivers. They have a worldwide distribution.	▪ Onchocerciasis or river blindness: Africa, and some parts of Latin America
Cockroach	5 to 73mm in length Two pairs of wings Yellow-brown to dark colour	These insect are very agile and fast and live in colonies. They prefer manufactured structures where it is warm. In the tropics, they live and breed outdoors. Latrines may be infested in a refugee camp. They are particularly active at night.	▪ Cockroaches act as mechanical vectors and may transmit diarrhoeal diseases, typhoid fever, dysentery, viral diseases: Worldwide
Tick Hard tick Soft tick	7 to 20mm in length Hard back Soft back	Both males and females feed on warm-blooded animals and humans. They are attracted by the carbon dioxide from their prey. Hard ticks are located in vegetation and soft ticks live in close association with available prey. They can survive several years of starvation.	▪ Relapsing fever: Worldwide ▪ Q-fever: Africa, Americas ▪ Lyme disease Arbovirus diseases: Worldwide ▪ Ticks are very painful biters and can cause serious loss of blood
Cyclops (Cyclopidae family)	Small crustacean 0.5 to 2mm in length	These are the intermediate host of the guinea worm. They live in any artificial or natural accumulation of stagnant water, which may be used as drinking water.	▪ Guinea worm or Dracunculiasis: Africa
Water snail (mollusc) 1. Biomphalaria 2. Bulinus 3. Oncomelania	Aquatic snails	Snails are found in all suitable types of water except for salty and acidic waters. Snails serve as an intermediate host of shistosomiasis worms.	▪ Shistosomiasis (or bilharzia): In the tropics, mainly in Africa and East Asia

Summary of personal protection and hygiene methods

Table 8-15 gives a summary of selected disease vectors and the corresponding personal protection and hygiene methods for controlling the transmission of these diseases.

Table 8-15: Examples of hygiene practices and personal protection methods against selected disease vectors, diseases and nuisance pests[28]

Target Species	Disease(s) carried	Personal protection methods (other than vaccines)	Vector hygiene methods
Anopheles mosquitoes	Malaria Lymphatic filariasis	Chemoprophylaxis, mosquito nets (impregnated) Mosquito nets (impregnated)	Residual indoor spraying, burning mosquito coils at night, space spraying before retiring (bedroom needs to be screened for effectiveness), Impregnated plastic sheeting
Culex mosquitoes	Lymphatic filariasis Japanese encephalitis	Mosquito nets (impregnated), repellents Mosquito nets (impregnated), repellents	Elimination of breeding sites on compound, Impregnated plastic sheeting
Aedes mosquitoes	Viral encephalitis Dengue/Dengue haemorrhagic fever Yellow Fever Lymphatic filariasis	Repellents	Elimination of breeding sites in and around house, impregnated plastic sheeting
Cockroaches	Diarrhoeal infections		Kitchen hygiene, all food leftovers removed at night
Houseflies	Diarrhoeal infections Eye infections		Kitchen hygiene, proper (re)heating of cooked food, daily rubbish removal
Tsetse flies (Glossina)	Sleeping sickness	Repellents, impregnated clothing	Avoiding riverside laundering and defecation, installation of tsetse traps in human settlements
Bedbugs	None	Mosquito nets (impregnated)	Regular airing and washing bedding materials and beds
Jigger fleas	None	Wearing shoes	Pig control in residential areas, chemotherapy of dogs and cats, pesticide treatment of adjacent land
Lice	Epidemic typhus Relapsing fever Trench fever	Chemoprophylaxis	Body hygiene, including use of shampoos, laundering clothes
Rodents	Plague Leptospirosis		Rat-proofing of houses and storage facilities, rubbish removal, kitchen hygiene

Insecticides: recommended and safe use

References for the recommended and safe use of chemicals are 'Pesticides and Their Application for the Control of Vectors and Pests of Public Health Importance'[23] and 'Manual for Indoor Residual Spraying, Application of Residual Sprays for Vector Control (WHO, 2000) and 'Emergency Vector Control Using Chemicals.'[21] The WHO website www.who.int/whopes also provides information about the safe selection and use of pesticides.

Vector control measures should address two principle concerns: efficacy and safety. They should be carried out according to internationally agreed methods and ensure that staff

and the affected population are adequately protected. There following points about pesticide safety that should be emphasised in emergency settings:

Safe use and storage of pesticides:

▪ Extra precaution should be taken choosing insecticides and deciding when, how, and for how long to apply them. Strict procedures must be followed when handling insecticides and their equipment. Pesticides and the spray machines should never be transported in vehicles that are also used for carrying food. They must be stored in locked and ventilated buildings. There is an increased danger of pesticide poisoning among displaced populations. Although unintentional, the danger of poisoning is because children have few toys to play with, the novelty of the situation and the traumatic experience of being displaced.

Safe storage and disposal of used insecticide containers:

▪ Strict guidelines have been developed for this and should be implemented to ensure that the displaced community cannot obtain used pesticide containers.

Safety of the spraying staff:

▪ Volunteers can be used for some types of spraying.

Also ensure that sprayers have:

▪ Prior training on the safe use of pesticides;

▪ Protective clothing (uniforms, gloves, masks etc.);

▪ Never smoke, drink or eat during the job;

▪ Access to good washing facilities after the job is done.

It is rare to find sprayers that meet all the above conditions in refugee situations. Appropriate training, protective clothing and equipment and washing facilities should, therefore, be provided.

Solid waste management

Inappropriately disposed solid waste poses significant health problems. Poorly managed solid wastes provide good places for disease-causing insects and rodents to live and breed. Such insects and rodents include mosquitoes, flies and rats (see the vector control section of this chapter for additional details). Improper dumping of solid waste can lead to contamination of water sources, both groundwater and surface water sources, through leachate pollution.

Assessments of solid waste generation and practices should be determine the type and quantity of waste produced. Based on assessment information, options for solid waste management should be explored with the community and local officials. Options for improving solid waste management practices include on site and off site disposal methods and strategies aimed at waste reduction, reuse and recycling.

Standards and key indicators for solid waste management

The following minimum standard has been established for solid waste management in emergencies:[24]

▪ People have an environment that is acceptably uncontaminated by solid waste, including medical waste and have the means to dispose of their domestic waste conveniently and effectively.

Key indicators related to this standard are presented in Box 8-27.

8

Box 8-27: Key indicators for solid waste management[24]

- People from the affected population should be involved in the design and implementation of the solid waste programme;
- Household waste must be put in containers daily for regular collection, burnt or buried in a specified refuse pit;
- All households must have access to a refuse container and be no more than 100 metres from a communal refuse pit;
- At least one 100-litre refuse container must be available per ten families, where domestic refuse is not buried on site;
- Refuse must be removed from the settlement before it becomes a nuisance or a health risk;
- Medical wastes must be correctly designed and disposed in especially constructed and operated pits or incinerators with a deep ash pit, all within the boundaries of each health facility;
- No contaminated or dangerous medical wastes (needles, glass, dressing, drugs, etc.) must be near living areas or public spaces at any time;
- There must be clearly marked and appropriately fenced refuse pits, bins or specific areas at public places such as markets and slaughtering areas, with a regular collection system in place;
- The final disposal of solid waste must be carried out in places and ways that avoid creating health and environmental problems for the local and affected populations.

Methods for disposing of solid waste[12]

In emergencies, disposal methods that are on site or close to dwellings are often preferred too off site disposal methods. On site methods are preferable because no waste is removed and therefore no transport is needed especially when personnel resources are limited. On site disposal is appropriate where waste volumes are low, where there is plenty of space available and waste is largely organic or recyclable.

Off site disposal is appropriate when large volumes of waste are generated or when available space among dwellings is limited. The following measures must be considered when selecting and developing an appropriate disposal site:

- Locate sites at least 500 metres (ideally one kilometre) downwind of the nearest settlement;
- Locate sites downhill from groundwater sources;
- Locate sites at least fifty metres from surface water sources;
- Provide a drainage ditch downhill of landfill sites on sloping land;
- Fence and secure access to the site; and
- Ensure property is available for waste disposal use.

Various types of waste disposal methods including their description, advantages and constraints are presented in Table 8-16.

Photo International Federation

Table 8-16: Disposal methods for improving solid waste[12]

Disposal option	Description	Advantages	Constraints
Communal pit disposal	Consumers dispose of waste directly into a communal pit; size of pit based on six cubic metres per fifty people; pit fenced off and not farther than 100m from dwellings; waste to be covered weekly to minimise flies and other pests	Rapid to implement; little operation and maintenance required.	Distance to communal pit can cause indiscriminate disposal; waste workers required to manage pits.
Family pit disposal	Better long-term option where there is enough space; fairly shallow (up to one metre deep); families must regularly cover waste with soil or ash; best suited where families have large plots and where organic food wastes are the main domestic refuse.	Families responsible for managing their own waste; no external waste workers required; community mobilisation can be incorporated into hygiene promotion programmes.	Involves considerable community mobilisation for construction, operation and maintenance of pits; considerable space needed.
Communal bins	Communal bins used to collect waste; bins located where they can be easily removed for transportation and disposal; bin can be constructed of an oil drum cut in half (based perforated to allow liquid to pass through); one 100-litre bin for every fifty people for domestic waste.	High hygienic and sanitary management method; final disposal of waste away from dwellings	Significant collection, transportation and human resourced required; system takes time to implement; efficient management is essential.
Landfilling	Waste placed in a large pit or trench; each day deposited refuse is covered with 0.5m of soil to discourage animals and flies; location of landfill decided with local authorities and affected population; site to be fenced and at least 1km downwind of nearest dwelling.	A sanitary disposal method if managed effectively.	Reasonably large land area required.
Incineration	Incineration only takes place off site or at a considerable distance downwind of dwellings; burning reduces the volume of waste and is appropriate where there is limited space for burial or landfill; waste should be burnt in pits and covered with 0.5m of soil once incinerated.	Burning reduces volume of combustible waste considerably; is appropriate in off site pits to reduce scavenging.	There can be smoke or fire hazards.
Recycling	Complex systems inappropriate, but plastic bags, containers, tins and glass will often be automatically recycled where scarce.	Recycling is environmentally friendly.	Limited potential in most emergencies; expensive to set up.

Disposal of medical waste

Medical waste can be defined as waste generated by hospitals, health centres or any place where medical care takes place. Poorly managed medical waste poses disease and injury risks to staff, patients and visitors. It is important therefore that medical waste be managed and disposed of properly and that high standards of hygiene are achieved at medical facilities. The following discussion focuses on improving medical waste management at hospitals and health centres and is taken from 'Starting Health Care Waste Management in Medical Institutions, A Practical Approach'.[24] Additional details about managing medical waste are available through this reference.

Improvements in waste-related hospital hygiene starts with separation of waste at the point of origin, safe storage and handling of waste in departments and proper disposal to minimise risk to staff, patients, hospital visitors and the larger community. Lasting improvements to waste management practices requires a strong commitment from senior directors and motivation of medical and support staff.

The key to managing medical waste better is to achieve change in the way waste is handled and stored by introducing a few simple steps. The following is a systematic approach to improving management of medical waste:

- Establish a three-bin system with three categories (see Table 8-17 for more details);

- Colour code bags and containers to differentiate between general and potentially infection wastes;

- Block transmission routes by ensuring that sharp items are not placed in plastic bags but only in rigid containers and that all waste containers are covered to prevent air-borne dispersal of pathogens;

- Specify different locations for general and potentially infectious waste (always away from patient areas);

- Fix collection schedules to ensure regular removal of waste;

- Replace bags and sharps containers when they are three-quarters full to prevent risk of bags tearing or injury from all protruding sharp items;

- Seal all bags that leave the medical area;

- Use rigid containers clearly marked as 'GENERAL WASTE' or 'INFECTIOUS WASTE ONLY' for storage bags awaiting removal from the medical site;

- Clearly label sharps containers as 'SHARPS' in the local language to remind medical staff what it contains;

- Ensure that waste is removed from central storage within twenty-four hours in hot, arid and tropical areas in the hot season and a maximum of forty-eight hours in the cool season. In temperate climates, waste should be disposed of within forty-eight hours;

- Ensure that medical waste at the final disposal site is disposed properly;

- Highly infectious waste such as body fluids, tissue and faecal stool samples are autoclaved before disposal;

- Assign a person in every department to be responsible for ensuring good waste management practices in the department;

- Provide refresher training to all staff and initial training to new employees on proper management and disposal of medical waste.

Table 8-17: Segregation categories for medical waste[15]

Category of waste	Description	Disposal methods
General Waste	Kitchen waste, paper and packaging, etc.	On-site pit disposal Burning Sanitary landfilling
Pathological and infectious waste	Lab cultures, wastes from isolation wards, tissues, body parts, blood and other body fluids, etc.	Incineration Burning and burial Placenta pit
Sharps	Needles, blades, scalpels, glassware, infusion set, etc.	Incineration at sufficient temperature (>1000ºC) Sharps pit

Drainage

In this chapter, the term *wastewater* includes storm water, floodwater, domestic wastewater and wastewater from medical facilities, but does not include water that contains excreta. Draining wastewaters properly is important to avoid a number of scenarios that can lead to increased health risks. Poor drainage can lead to the following:

- Increased number of breeding sites for water-related vectors (e.g. mosquitoes);
- Erosion of shelters;
- Wastewater filling pit latrines and solid waste pits;
- Pollution of surface or ground water; and limiting access to shelters.[15]

Standards and key indicators for drainage

The minimum standard where people have an environment in which the health and other risks posed by water erosion and standing water (including storm water, floodwater, domestic wastewater and wastewater from medical facilities) are minimised has been established for drainage in emergencies.[24]

Key indicators related to this standard are presented in Box 8-28.

Box 8-28: Key indicators for drainage[24]

- Areas around dwellings and water points are kept free of standing wastewater;
- Storm water drains must also be kept clear;
- Shelters, paths, water and sanitation facilities are not flooded or eroded by water;
- Water point drainage must be well planned, built and maintained including drainage from washing and bathing areas as well as water collection points;
- Drainage waters do not erode or pollute surface or ground water sources;
- Sufficient numbers of appropriate tools are provided for small drainage works and maintenance where necessary.

Options for proper drainage of wastewater[12]

Several types of technology options exist for properly draining wastewater in emergencies. These options include:

- Soakaways or soak pits;
- Infiltration trenches;
- Diversion to natural drainage;
- Diversion to manufactured drainage;

- Bucket basins;
- Evaporation pans;
- Evapotranspiration beds;
- Irrigation use.

Table 8-18 describes these technologies with their advantages and constraints.

Table 8-18: Disposal methods for improving solid waste[12]

Disposal option	Description	Advantages	Constraints
Soakpits	Soakpits are holes in the ground that allow the percolation of wastewater into the surrounding soil; the success of soakaway depends on percolation of the soil; commonly between two and five metres deep and 1 to 2.5 metres in diameter; can be lined or filled with stones, blocks or bricks to support pit walls.	Soak pits are easy and relatively quick to construct; can be used on flat sites.	Soakpits are only appropriate in permeable ground conditions; can only cope with a limited volume of wastewater.
Infiltration trenches	Infiltration trenches are constructed from porous pipes that are buried in a series of trenches that filled with course gravel; pipes are laid horizontally for water to distribute evenly along the entire trench; pipes are 100mm in diameter; trenches 300 to 600mm wide and dug about 1m below the pipe.	Trenches are easy and relatively quick to construct; used on flat sites; can cope with a greater amount of wastewater than a soakpit of the same volume.	Infiltration trenches are only appropriate in permeable ground conditions.
Disposal option	Description	Advantages	Constraints
Natural drainage	Natural drainage involves the disposal of wastewater to flowing streams or rivers; is the preferred method of wastewater disposal; drainage into stream or river should occur downstream of water retrieval points; drainage channel must be sloped 1 in 200 for earth channels; large amounts of wastewater should not be drained into small watercourses.	A minimal amount of construction work is required; there are negligible physical effects on landscape.	Natural drainage is rarely possible; may inadvertently pollute watercourses.
Man-made drainage	Manufactured drainage involves the construction of drainage channels cutting through natural obstacles to reach an existing watercourse; requires a great deal of work and is expensive and time consuming.	Manufactured drainage may be the only option in impermeable sites with little slope.	Manufactured drainage is expensive and time consuming to construct; can have a large impact on the surrounding landscape.

Evaporation pans	Evaporation pans are shallow ponds holding and allowing water to evaporate; evaporation rates depend on many factors: temperature, humidity and wind speed; should be used only where the mean evaporation rate is at least 4mm/day, where rainfall is negligible and where there is no viable alternative.	Evaporation pans are suitable in arid conditions where other disposal methods, such as infiltration, are inappropriate.	Evaporation pans may encourage mosquitoes, flies, etc.; large land areas are required.
Evaporation and evapotrans-piration beds	Evaporation and evapotranspiration beds consist of porous pipes buried in shallow sand beds; method relies on capillary action to draw water to the surface of sand bed; evapotranspiration beds have vegetation planted in the beds to increase water removal; size depends on soil type, vegetation, wind speed, humidity and other factors.	Beds are suitable in arid conditions where other disposal methods are inappropriate.	Careful management is required; beds can only cope with a limited volume of water.
Irrigation	Irrigation is appropriate where large volumes of wastewater are generated; might involve planting fast growing fruit trees such as papaya or banana in drainage channels; might involve drainage channels can be diverted to areas to promote plant growth; monitoring is needed so that drinking water is not diverted for irrigation use where there is a limited water supply.	Irrigation can make use of large volumes of water; contributions to agricultural activities in the affected area.	In general, small-scale possibilities only are viable; it may encourage inappropriate use of drinking water.

Planning guidelines for institutions

Tables 8-19 and 8-20 provide guidelines on minimum water quantities and minimum number of toilets for institutions.

Table 8-19: Planning guidelines for minimum water quantities for institutions and other ûses[24]

Health centres and hospitals	5 litres/out-patient 40-60 litres/in-patient/day Additional quantities needed for laundry, flushing toilets, etc.
Cholera centres	60 litres/patient/day 15 litres/carer/day
Therapeutic feeding centres	30 litres/in-patient/day 15 litres/carer/day
Schools	3 litres/pupil/day for drinking and hand washing (use for toilets not included)
Mosques	2-5 litres/person/day for washing and drinking
Public toilets	1-2 litres/user/day for hand washing 2-8 litres/cubicle/day for toilet cleaning

All flushing toilets	20-40 litres/user/day/for conventional flushing toilets connected to a sewer 3-5 litres/user/day for pour-flush toilets
Anal washing	1-2 litres/person/day
Livestock	20-30 litres/large or medium animal/day 5 litres/small animal/day
Small-scale irrigation	3-6mm/m^2/day, but can vary considerably

Table 8-20: Planning guidelines for minimum numbers of toilets at public places and institution in disaster situations[24]

Market areas	1 toilet to 20 stalls
Hospitals and medical centres	1 toilet to 10 beds or 20 out-patients
Feeding centres	1 toilet to 20 adults 1 toilet to 10 children
Schools	1 toilet to 30 girls 1 toilet to 60 boys
Offices	1 toilet to 20 staff

Water and sanitation in cholera outbreak response

This section explores the very important role that environmental health plays in the control of cholera. Cholera is a diarrhoeal disease caused by the bacterium *Vibrio cholerae* (either type 01 or 0139) and is usually transmitted through faecally contaminated water or food. Of those infected, about 20% will develop Acute Watery Diarrhoea (AWD). About 10% to 20% percent of individuals developing acute watery diarrhoea will also develop severe watery diarrhoea and vomiting that will lead to large fluid losses. Because of these losses, death due to dehydration can occur within hours if prompt treatment is not provided. Cholera has an incubation period of two hours to five days. Due to this short incubation period, the number of cases can rise rapidly. Therefore, a quick response to the outbreak is crucial. The risk for cholera outbreaks is highest in areas where there is over-crowding and where inadequate sanitation, unsafe water supplies and poor food safety and hygiene exist.

Because the disease spreads quickly, it is very important to take early action to save lives in any AWD outbreak. There is a tendency to wait for the confirmation on Cholera; however, laboratory diagnosis and confirmation are often delayed because of poor access to laboratories, transport, media etc or governments are reluctant to declare that there is a confirmed cholera outbreak fearing an adverse impact on tourism, travelling and other businesses. Every time anyone over the age of five dies from AWD, a response should be initiated immediately.[36]

The action cycle has four stages
- Preparedness;
- Prevention;
- Containment/treatment;
- Evaluation, improvement of preparedness.

In all four stages, community participation is of the utmost importance. Volunteers, community health workers and extension officers should be used as an extended arm of the peripheral health care system.

The following information on the importance of environmental health in preventing and controlling cholera is taken from:

▪ The WHO Global Task Force on Cholera Control, 'Cholera outbreak, Assessing the Outbreak Response and Improving Preparedness' 2004; and

▪ The International Federation 'Diarrhoeal Disease and Cholera Preparedness and Response Guidelines' May of 2007.

Table 8-21: Environmental health in cholera outbreak response

Outbreak detection	**Rapid verification and response team:**
	▪ When an outbreak is suspected after a person over five has died of AWD or a case has been confirmed, it is important to send a multidisciplinary team to the field to take the first measures for controlling the disease's spread. The team can include a water and sanitation expert to investigate possible sources of contamination and start the appropriate treatment of the sources;
	▪ The following potential vehicles of transmission must be investigated so that appropriate control measures can be taken:
	▪ Drinking water that may have been contaminated at source or during transport and storage, or ice made with contaminated water;
	▪ Food that might have been contaminated during or after preparation;
	▪ Seafood;
	▪ Fruits and vegetables.
Organization of the response	**When the first report of a suspected cholera case is received, the following activities should be performed (the order can vary according to the situation):**
	▪ Convene the cholera coordination committee;
	▪ Make an inventory of available essential supplies;
	▪ Inform the public, neighbouring districts and media;
	▪ Conduct training if needed;
	▪ Set up temporary treatment centres if needed;
	▪ Collect, report and analyse data on cases, deaths and control activities. Document the epidemic; provide feedback and adapt interventions;
	▪ Implement measures to control the spread of the disease (disinfection of water sources, food safety measures);
	▪ Conduct health promotion campaigns;
	▪ Ask for additional help;
	▪ Monitor and evaluate control measures.
Case management treatment	**Health promotion: The most important messages to prevent the family (and others) from being contaminated are:**
	▪ Wash your hands after taking care of patients—whether after touching them, their stools, their vomit or their clothes;
	▪ Beware of contaminating the water source by washing patients' clothes in the water.
Reduction of mortality	**Oral rehydration therapy:**
	▪ The community must be taught about the importance of starting Oral Rehydration Solution early and attending health centres quickly.

8

Water, sanitation and hygiene in emergencies

Hygiene measures in health care facilities	**Functions to be ensured in the cholera treatment unit:** *Prevention and hygiene:* ▪ Kitchen for food preparation; ▪ Water treatment; ▪ Preparation of chlorine solution; ▪ Clothes washing facilities, laundry. *Health promotion:* ▪ Health promotion activities inside the Cholera Treatment Unit (CTU) and at patients, home by disinfection teams; ▪ Active case finding in the refugee camp/villages. *Waste and environment:* ▪ Safe waste disposal (incinerator, dustbins); ▪ Cleaning and disinfection of the CTU; ▪ Morgue. *Disinfection of patients' bedding and clothing:* ▪ Patients' bedding and clothing can be disinfected by stirring them for five minutes in boiling water. Bedding including mattresses can also be disinfected by thorough drying in the sun.
Involvement of the community to limit the spread of disease	**Health promotion campaign during outbreak. An epidemic of cholera can be more quickly controlled when the public understands how to help to limit its spread. Health promotion is crucial to ensure the participation of the community:** ▪ Select the best way to disseminate messages to the community; ▪ Communication through radio, posters, talks etc; ▪ Use the local language; ▪ Give clear information—but not too many messages; ▪ Adapt messages to the community's economic , cultural and social circumstances and its ability to cope with behaviour change e.g. chlorine or soap might not be affordable in poor communities; ▪ Organise talks in places where people are usually waiting (health care facilities etc. Active case-finding: If possible, active case-finding in communities should be organised to allow: ▪ The detection of cholera patients at an early stage of the disease; ▪ Advise family members and the community about protecting themselves from contamination. *Key messages to give to the community:* ▪ Come to the health care facility as soon as possible in case of Acute Watery Diarrhoea; ▪ Start drinking Oral Rehydration Solution at home and when travelling to the health care facility; ▪ Wash your hands before cooking, eating and after using the toilet; ▪ Cook food; ▪ Drink safe water.

Control of the environment: safe water	***Types of access to drinking-water:***
	▪ Household connection, public standpipe, borehole, protected dug well, protected spring, rainwater collection, unprotected well, vendor and tanker truck. The drinking-water might be contaminated where this is contact with:
	▪ Hands and bodies of people who have cholera although show no symptoms;
	▪ Contaminated articles such as buckets, cups, clothes;
	▪ Faecal material e.g. by infiltration into wells when the latrines are placed less than thirty metres away from the wells).
	Contaminated wells:
	▪ Unprotected water sources are very often contaminated. Arrangements should be made for the protection of water sources as an important measure for reducing the risk of contamination;
	▪ Treatment of the source might be the best way to prevent the spread of cholera in the community. In emergencies, free residual chlorine of about 0.5 mg/litre is advisable;
	▪ When the water source is too turbid, it should be filtered before disinfection. Alternatively, filtration and chlorination could be done at the household level.
	Provision of safe drinking-water:
	▪ The conditions and practices of water collection and storage contribute to the safety of household water;
	▪ There is evidence that storage in a narrow-mouthed vessel with a protected dispenser (spigot, spout) is much safer than storage in a wide-mouthed vessel. Drinking water should be kept in a clean covered pot or bucket. It is better to pour the water from the container than to use a potentially contaminated article (e.g. cut without handle) to retrieve the water.
	Household water treatment:
	▪ Various methods of household water treatment are available such as boiling, chlorination, storage in improved vessels, solar disinfection with UV + heat, UV disinfection with lamps, chemical coagulation-filtration + chlorine disinfection.
Control of the environment: safe food	***Common sources of infection:***
	▪ Drinking contaminated at its source e.g. by faecally contaminated surface water entering an incompletely sealed well, or during transport or supply or during storage e.g. by contact with hands soiled with faeces;
	▪ Ice made from contaminated water;
	▪ Cooking utensils washed in contaminated water;
	▪ Food contaminated during or after preparation. Moist foods e.g. milk, cooked rice, lentils, potatoes, beans, eggs, and chicken, contaminated during or after cooking/preparation and allowed to remain at room temperature for several hours, provide an excellent environment for the growth of *Vibrio cholerae*;
	▪ Seafood particularly crustaceans and other shellfish taken from contaminated water and eaten raw or insufficiently cooked or contaminated during preparation;
	▪ Fruit and vegetables grown at or near ground level and fertilised with night soil, irrigated with water containing human waste or 'freshened' with contaminated water and then eaten raw or contaminated during washing and preparation.

Control of the environment: sanitation	**Improvement of sanitation:** ■ The population should have access to an improved sanitation facility such as connection to a public sewer, connection to a septic tank, pour-flush latrine, simple pit latrine and ventilated improved latrine; ■ Facilities such as bucket latrines, public or shared latrines and trench latrines should be replaced as soon as possible by improved sanitation facilities. **Involving the community:** ■ The community should be involved in all phases of implementation of on site sanitation projects. Without their participation and involvement, there is a risk of misuse or non-use of the sanitation facilities. **Sanitation and health:** ■ The link between sanitation, water supply and health are directly affected by hygiene behaviour. The benefits of access to sanitation services are never met without good hygiene behaviour; ■ Sanitation facilities should be hygienic so that they do not endanger the health of the users and the community as a whole.
Funeral practices	**Recommendation for funerals:** ■ Funerals for people who die of cholera—or of any other cause in a community affected by cholera—can contribute to the spread of an epidemic. If funeral feasts cannot be cancelled, meticulous hand washing with soap and clean water is essential before food is prepared and handled. **Recommendations for handling corpses:** ■ It is important to ensure disinfection of corpses with a 0.5% chlorine solution. For transporting cholera victims' corpses, corpse-carriers should wear gloves and corpses should be carefully wrapped; ■ If possible, physical contact between the family and the corpse should be prevented. **If the corpse must be touched, the family must be aware of the need to:** ■ Wash hands with soap after touching the corpse; ■ Avoid putting hands in the mouth after touching the corpse; ■ Disinfect the dead person's clothing and bedding by stirring in boiling water for five minutes or by drying them thoroughly in the sun before and after normal washing **People who wash and prepare the dead body must:** ■ Wear gloves, apron and mask; ■ Clean the body with chlorine solution (0.5%); ■ Fill the corpse's mouth and anus with cotton wool soaked in chlorine solution; ■ Bandage the corpse's head to hold the mouth closed; ■ Not to empty the intestines.
Surveillance	**Descriptive epidemiology** ■ The important information is the number of cases and deaths by area, time and by population sub-groups; calculations of attack and case-fatality rates allow the comparison of different areas and periods. **Attack rate:** ■ Calculated as the number of cases/population at risk in a given period. **When the attack rate is high, it indicates that:** ■ There is a common source of infection; ■ The area is very crowded (as in urban areas, for example).

Table 8-22: Essential rules in a cholera treatment unit[6]

Mode of transmission	Essential rules in the cholera treatment unit	Additional recommended rules
People	Access limited to patient + one family member + staff One-way flow of people	Ideally one carer per patient only Three separate spaces within cholera treatment unit
Water	Safe water (chlorination concentration according to specific use) Large quantity needed (minimum 10 litres per person per day)	Ideally fifty litres per patient per day
Hands	Hand-washing stations with safe water and soap in sufficient quantities Wash hands with water and soap ▪ Before and after taking care of patients; ▪ After using latrines; ▪ Before cooking or eating; ▪ After leaving the admission ward.	Cut and clean nails
Food	Cooked food Health care workers should not handle food or water	Food provided by cholera treatment unit (rather than by families) Large stocks of food might be 'tempting' and lead to security problems
Clothes and bedding	Wash clothes and bedding with the appropriate chlorine solution	If chlorine is unavailable, wash clothes with soap and dry them in the sun
Environmental contamination (faeces and waste)	Ensure exclusive latrines for the cholera treatment unit Disinfect buckets, soiled surfaces and latrines regularly with the appropriate chlorine solution Incinerator for medical waste	Latrines should be sited at least 100 metres away from the wells or surface sources Special cholera beds (cholera cots)
Corpses	Separate morgue Disinfect corpses	Identify safe funeral practices Dispose of corpses as soon as possible

Water, sanitation and hygiene in emergencies

Table 8-23: Chlorine dilution according to use[6]

Chlorine product	For disinfecting: ▪ Excreta ▪ Cadavers ▪ Body fluids Prepare a 0.5% available chlorine solution	For disinfecting: ▪ Gloved hands ▪ Bare hands and skin ▪ Floors ▪ Clothing and equipment ▪ Bedding Prepare a 0.05% available chlorine solution
Household bleach (5% active chlorine)	Add 1 litre of bleach to 9 litres of water (1:10 solution)	Add 100 ml of bleach to 9.9 litres of water or Add 1 litre of 1:10 bleach solution to 9 litres of water (yields a 1:100 solution)
Household bleach (30% active chlorine)	Add 16 grams or 1 tablespoon to 1 litre of water	Add 16 grams or 1 tablespoon to 10 litres of water
Calcium hypochlorite powder or chlorine granules 70%	7 grams or half a tablespoon dissolved in 1 litre of water	7 grams of half a tablespoon dissolved in 10 litres of water

Table 8-24: Key messages for health promotion

Personal hygiene	▪ Wash your hands with soap, ashes, or lime: ▪ Before cooking; ▪ Before eating or before feeding your children; ▪ After using the latrine or cleaning your children after they have used the latrine. ▪ Wash all parts of your hands—front, back, between the fingers, under nails. ▪ Use latrine to defecate. ▪ Keep the latrine clean.
Food	▪ Cook raw food thoroughly; ▪ Eat cooked foods immediately; ▪ Store cooked food carefully in refrigerator; ▪ Reheat cooked food thoroughly; ▪ Avoid contact between raw food and cooked food; ▪ Eat fruit and vegetable you have peeled yourself; ▪ Keep all kitchen surfaces clean; ▪ Wash your cutting board especially well with soap and water; ▪ Wash your utensils and dishes with soap and water; ***Cook it — peel it — or leave it!!!***
Safe drinking-water	▪ Even if it looks clear, water can contain cholera germs; ▪ Boil, or add drops of chlorine to the water before drinking; ▪ Keep drinking water in a clean, covered pot or bucket or other container with a small opening and a cover; It should be used within twenty-four hours of collection; ▪ Pour the water from the container—do not dip a cup into the container. ▪ If dipping into the water container cannot be avoided, use a cup or other utensil with a handle.

Wells	• Do not defecate or urinate in or near a source of drinking water;
	• Do not wash yourself, your clothes, or your pots and utensils in the source of drinking water (stream, river, or water hole);
	• Open wells must be covered when not in use to avoid contamination;
	• The buckets used to collect water should be hung up when not in use—they must not be left on a dirty surface;
	• The area surrounding a well or a hand pump must be kept as clean as possible;
	• Get rid of refuse and stagnant water around a water source.
For People with diarrhoea	• The biggest danger of cholera is loss of water from the body;
	• Do not panic, but act quickly;
	• Drink a solution of oral rehydration salts made with safe (boiled or chlorinated) water;
	• Go immediately to the health centre. Continue drinking as you go.
Taking care of patients	• Wash your hands after taking care of patients, touching them, their stools, vomit, or clothes;
	• Avoid contaminating a water source by washing a patient's clothes in it;
	• Stools and vomit from a cholera patient can be mixed with disinfectant (e.g.; cresol);
	• Disinfect the patient's clothing and bedding with a solution of chlorine (0.05%) or by stirring them in boiling water or by drying them thoroughly in the sun before or after normal washing.

Table 8-25: Rules for safe preparation of food to prevent cholera

Cook (raw) food thoroughly	Fish, shellfish, and vegetables are often contaminated with cholera bacteria. Therefore, heat all the parts of the food to at least 70ºC. Do not eat uncooked foods unless they can be peeled or shelled.
Eat cooked foods immediately	When there is a delay between cooking and eating food as when it is sold in restaurants or by street vendors, it should be kept over at heat of 60ºC or more until served.
Store cooked foods carefully	If you must prepare foods in advance or want to keep leftovers, be sure to cool them to below 10ºC as soon as possible and then store them in a refrigerator or icebox below 10ºC. Cooked foods that have been stored must be thoroughly reheated before eating. Foods for infants should be eaten immediately after being prepared, and should not be stored at all.
Reheat cooked foods thoroughly	Proper storage at low temperature slows down the growth of bacteria but does not kill them. Once again, thorough reheating means that all parts of the food must reach at least 70ºC. Eat food while it is still hot.
Avoid contact between raw foods and cook foods	Safely cooked food can be contaminated through even the slightest contact with raw food directly or indirectly through cutting surfaces or knife blades.
Choose foods processed for safety	Canned, acidic and dried foods should be without risk.
Wash hands repeatedly	Wash hands thoroughly before preparing food and after every interruption—especially if you have to change or clean a baby or have used the toilet or latrine. After preparing raw foods such as fish or shellfish wash your hands again before handling other foods.
Keep all kitchen surfaces clean	Since foods are so easily contaminated, any surface used for food preparation must be kept clean. Think of every food scrap, crumb or spot as a potential source of bacteria. Clothes used for washing or drying food, preparation surfaces, dishes, and utensils should be changed every day and boiled before reuse. Separate cloths that are used for cleaning the floors also require daily washing.
Use safe water	Safe water is just as important for food preparation as for drinking.

Food security and nutrition in emergency

9

Photo: International Federation

Food security and nutrition in emergencies

Description

The purpose of this chapter serves as a reference manual on the management of emergency nutrition field situations for humanitarian workers and medical professionals with limited nutrition training in emergencies. The chapter is also a reference manual for training staff on food security and emergency nutrition policies, guidelines, programme strategies, technical issues and best practices.

Learning objectives

- Recognising a food and nutrition emergency;
- Targeting and equitably distributing an adequate quality and quantity of food aid;
- Key emergency nutrition interventions such as therapeutic feeding and vitamin A supplementation;
- Monitoring the adequacy of the food aid and emergency nutrition response and nutrition surveillance.

Key Competencies

- Use of nutrition surveillance as part of early warning and for benchmarking;
- Use of standard methods to conduct a population nutrition survey to assess acute and severe malnutrition;
- Management of the food aid logistics, targeting and the equitable distribution of an adequate general food ration;
- Vitamin A supplementation in a nutrition emergency;
- When and how to implement supplementary food distribution;
- Treatment of severe acute malnutrition and operation of therapeutic and supplementary feeding centres;
- Treatment of severe anaemia;
- Monitoring and evaluation of food aid and nutrition interventions.

Introduction

> **Every man, woman and child has the inalienable right to be free from hunger.**
>
> **(First World Food Conference Declaration, Rome, 1974)**
>
> **Eradicate extreme poverty and hunger.**
>
> **(First Millennium Goal, UN, 2000)**

Household food security exists when the household has at all times physical and economic access to sufficient, safe and nutritious food for a healthy and active life; the

diet is adequate in both quality and quantity, providing the required amounts of energy, macronutrients (carbohydrates, protein, fats) and micronutrients (vitamins, minerals, electrolytes) and the special needs of infants and young children are met.

The right to adequate food is recognised in international legal instruments including declarations, which are nonbinding and conventions, which are treaties that carry the force of the law. The Convention on the Elimination of All Forms of Discrimination against Women in 1979 and the Convention on the Rights of the Child in 1989 state that states and non-state actors have responsibilities in fulfilling the right to food. While it is first and foremost the duty of individuals to find their own solutions to feeding themselves, it is the state's obligation to respect the freedom of individuals in realizing and protect their rights. Refugees and displaced people have the same human right to food as do non-refugees. Deliberate starvation or destruction of livelihoods such as production of crops and livestock as a war strategy is a violation of international law. Marginalised populations are vulnerable to food insecurity because of poverty. If the actions of individuals and of the state fail, the state must proactively take action, which might be economic support or the provision of direct food aid as a last resort to those who are unable to feed themselves.

The UN Millennium Development Goals elaborated in 2000 represent a commitment by all the 189 member states to reduce global deprivation and abuse of human rights. Poverty and hunger are perpetuated by economic and food insecurity all of which increase the vulnerability of populations to food and nutrition emergencies.

Figure 9-1 - Stages of a food and nutrition emergency
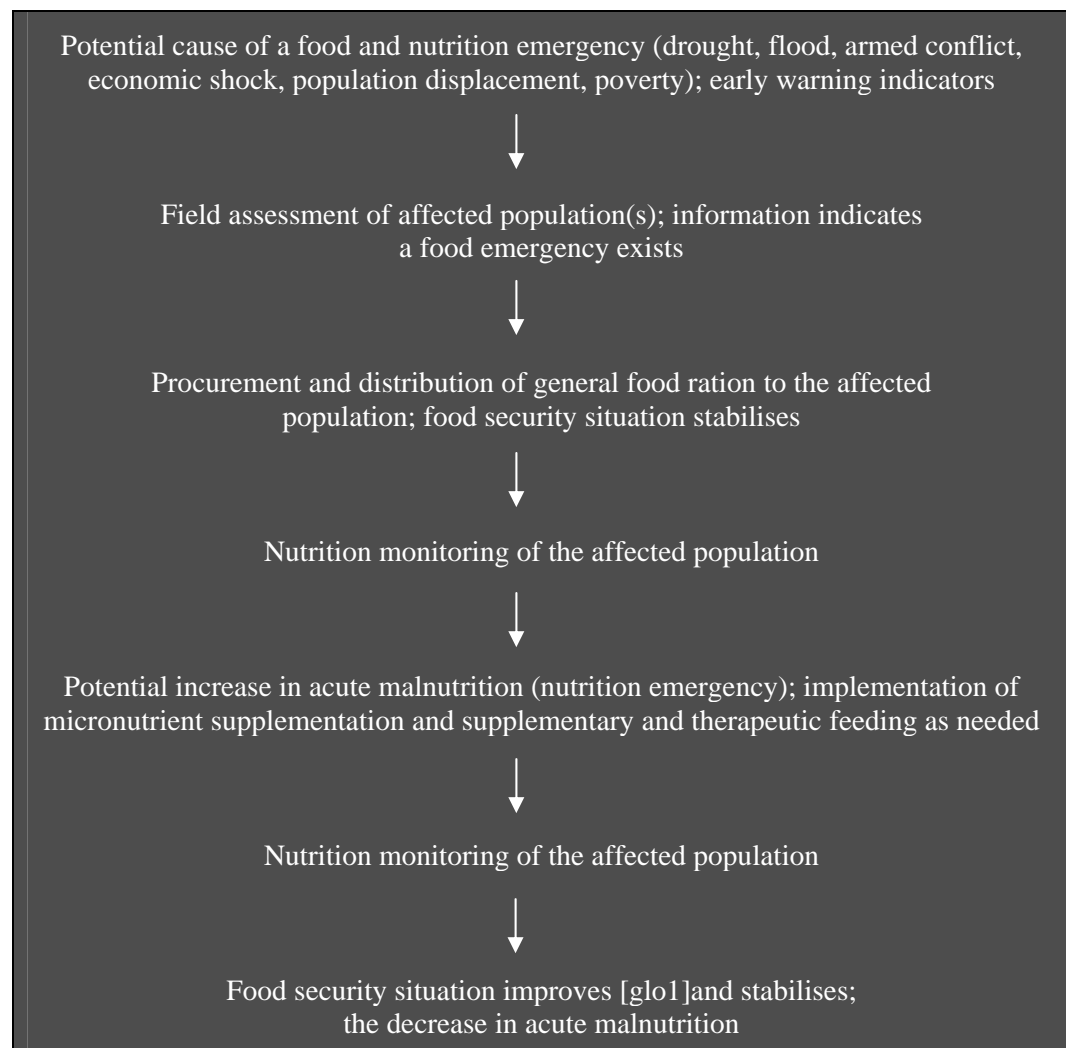
Causes of food and nutrition emergencies

Access to food and adequate nutrition is critical to survival in an emergency situation. Malnutrition can be the most serious public health problem in an emergency. A food emergency exists if depleted food supplies are not replaced in the short term by food aid. A **famine** occurs in a population whose food consumption is reduced to the extent that the population becomes acutely malnourished and there is a rise in mortality. A **nutrition emergency** exists when there is the risk of or an actual rise in mortality due to acute malnutrition. A **complex emergency** is an internal crisis in the state where the capacity to sustain livelihood and life is threatened by primarily political factors and, in particular, high levels of violence. In complex emergencies, the focus is typically short term in response to changing circumstances such as movements of armies and bandits.

Food and nutrition insecurity result from the following:

- A natural disaster due to climatic or other environmental conditions such as drought, flooding, major storms or insect infestation such as locusts; global warming might also contribute to an increase in droughts and floods;
- Armed conflict, war or political upheaval;
- Disruption or collapse of the food distribution network and/or the marketing system of a population. This might be the result of an environmental, political or economic crisis;
- Lack or disruption of the provision of emergency food distribution to a population experiencing a food shortage;
- HIV/AIDS;
- Extreme poverty of marginalised populations e.g. the elderly and urban slum populations who have poor access to water, sanitation, health care and livelihoods.

A **drought** is any unusual, prolonged dry period that reduces soil moisture and water supplies below the minimum level necessary for sustaining plant, animal and human life. Droughts occur because of low, sporadic or late rainfall and as a result of human activities such as deforestation, overgrazing by livestock, erosion, lack of soil conservation, reliance on the cultivation of single cash crops and traditional farming methods such as slash and burn.

The effects of drought are as follows:

- Overtaxing and drying up of water supplies resulting in the loss of crops, livestock and the lack of drinking water and water for washing and bathing;
- Crop failure, the depletion of food stocks and grazing for livestock causing temporary migration of families to areas with more pasture for remaining livestock or to cities for alternative sources of income. Livestock are susceptible to heat stress and drought.

Prolonged and repeated droughts may result in permanent changes in settlement, social and living patterns and major ecological changes, e.g., desertification, flash floods and soil erosion.

Most scientists agree that global warming because of increased emission of what are known as greenhouse gases is occurring. Greenhouse gases such as carbon dioxide from car exhaust and other gases from industrial plants and agricultural activities trap heat close to the earth's surface. The effect of global warming is an increase in extreme erratic weather and a rise in sea level leading to coastal erosion. Large-scale changes in rainfall and rainfall distribution will increase the risk in the subtropics of both droughts and floods because it will rain harder when it does rain.

9

Food security and nutrition in emergencies

Increasingly however, the main cause of food emergencies is armed conflict, not natural disaster.[AA] Food emergencies due to violent conflict occur when civilian populations flee and/or are cut off from food markets and humanitarian aide or by the deliberate destruction of crops or livestock. Conflicts can create famine by leading to the following:

- Disruption of the agricultural cycle;
- Displacement of farmers from the land;
- Interference in the market;
- Destruction of food stocks and harvests;
- Creation of food shortages that drive prices up to levels that low-income households cannot afford;
- Reducing physical access to displaced populations.

Africa has been home to a disproportionate share of the world's emergencies and has suffered a disproportionate burden of the world's famine-related mortality. Major armed conflict occurred in seventeen countries in Africa during the period 1990 to 2003. Africa, where the prevalence of underweight among children under the age of five is the highest in the world, is especially vulnerable to nutrition emergencies.[B] When a food emergency occurs, malnutrition, the resilience of livelihoods and household food insecurity to some extent predict the severity of the ensuing nutrition emergency and the ability of households to recover.

HIV/AIDS and household food security

HIV/AIDS among otherwise productive adult members of the household puts a household at high risk of food insecurity. Like households exposed to other food security shocks, households affected by HIV/AIDS resort to coping strategies. When a household income earner becomes too sick to work, the household may be forced to develop knowledge, skills, assets and activities required for a new livelihood so that the household has access to food or income to buy food. Other family members-often grandparents or children- must compensate for the lost income and care for the sick family member. Savings and assets may be depleted while medical costs rise. Children may lose one or both parent and no longer attend school. Orphans might become dependent on other households for their food and survival. Local institutions and traditions are over-burdened and break down e.g. food sharing, giving alms, lending money and adopting children-when so many households in one community are affected.

Like high levels of chronic malnutrition, widespread HIV/AIDS is an underlying factor that predicts the severity of an ensuing nutrition emergency for populations affected by HIV/AIDS as well as many households. When so many households in a community are affected, HIV/AIDS erodes institutions and traditions normally employed to mitigate food security shocks. Unlike other food security shocks, the effects of HIV/AIDS on the

Investment in increasing agricultural productivity and reducing the vulnerability of livelihoods a vital part of the fight against hunger and poverty. Photo: Yoshi Shimizu / International Federation

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[A] Natural disasters (mainly drought) were the main cause of 80% of food emergencies that occurred during the period 1986–1991 and the main cause of less than 60% during the period 1992–2003. Conflict and economic crises (mainly conflict) were the main cause of less than 20% of food emergencies during the period 1986–1991 and almost 40% of those that occurred during the period 1992–2003.
[B] During the period 1990–2005 the number of underweight children decreased in all regions except Africa; the prevalence of underweight children under five years of age is 24% in Africa (30.6% in East Africa).

household are permanent affecting long-term household food security, nutrition, health care and especially the support that is crucial for recovery.

> Drought has been the cause of repeated food and nutrition emergencies in the Horn of Africa in 2000, 2002 to 2003 and 2005 to 2006.
>
> In 2004, tropical storm Jeanne caused dangerous flooding and a food and nutrition [glo2] emergency in the Gonaives area of Haiti.
>
> Flooding, civil strife and economic factors, as well as HIV/AIDS as an underlying factor caused the food and nutrition crisis that affected southern [glo3] Africa in 2001-2002.

Population displacement

Refugees and Internally Displaced Persons (IDPs) have a high risk of becoming malnourished because they are cut off from their land and are restricted from cultivating crops and producing food in the areas to which they flee nor can they find a means of livelihood in urban areas. Millions of people throughout the world are displaced (Table 9-1). Within the UN system, humanitarian assistance to refugees is the specific mandate of UNHCR.

Humanitarian assistance and food aid distribution sometimes encourages population displacement and leads to large refugee settlements with high population densities, where the risk of disease epidemics with high levels of mortality is higher than in smaller camps. Whenever possible, assistance with strong referral networks should be provided to populations before they become displaced or to their camps if they are already displaced. Where people have been displaced, the food security of the host population must also be taken into account.

Table 9-1: Countries with 500,000 or more IDPs (2004 estimates)[28]

Country	Number of displaced persons (millions)
Sudan	4.0
Democratic Republic of the Congo	3.4
Colombia	3.1
Uganda	1.6
Turkey	1.0
Algeria	1.0
Myanmar	0.6-1.0
Iraq	0.9
Côte d'Ivoire	0.5-0.8
India	0.7
Azerbaijan	0.6
Indonesia	0.5
Bangladesh	0.2-0.5
Liberia	0.5
Sri Lanka	0.4-0.5
Syrian Arab Republic	0.2-0.5

Mortality rates

Malnutrition, even being mildly underweight, is associated with increased under-five mortality. WHO estimates that malnutrition is an underlying cause in more than half of all under-five child deaths. The biggest killer in emergencies is child malnutrition that is either recorded as a direct or as an underlying cause of death.

In a nutrition emergency where the prevalence of **acute malnutrition** among young children might be 10% to 15% and of **severe malnutrition**, 2% to 3%, mortality rates can be very high. Elevated **crude mortality** and **under-five mortality** rates are benchmarks for and definitions of a nutrition emergency (Table 9-2). Survival is at risk not only because of an inadequate and/or unbalanced diet but also because of disease outbreaks such as measles, TB, malaria, diarrhoeal diseases, HIV/AIDS and respiratory infections resulting in high death rates in the affected population. There is a strong relationship between malnutrition and fatality due to these infections. Vitamin A deficiency e.g. increases the duration, severity and complications of diarrhoeal disease in young children.

Mortality rates of displaced populations can be as high as ten times the death rates for the same populations in non-emergencies. These extraordinarily high mortality rates have been observed during the first few months after displaced people had arrive in camps. Peak mortality generally occurs some months into the emergency.

> In August 2004 in the refugee camps for Sudanese in eastern Chad, there was a large diarrhoea outbreak in the largest refugee camp (Bredjing) and a hepatitis E outbreak in the refugee camps in the south (Goz Amir and Djabal).

Table 9-2: Benchmarks for mortality rates[17]

Crude mortality rate (deaths/10,000/day)	Under-five mortality rate (deaths/10,000/day)	Health and nutrition situation
0.5	1	Normal
<1	<2	Elevated
1-2	2-4	Serious
>2	>4	Very serious
>5	>10	Catastrophic

Field assessment

Monitoring and evaluation is looked at in depth in the epidemiology section of this book; however, some concepts specific to food and nutrition are covered here.

Early warning and nutrition surveillance

Early warning consists of simple, predictive indicators or benchmarks to alert authorities to impending interruptions in food supply and/or food access. Possible early warning indicators include reduced rainfall, loss of livestock, deficit food production, food shortages, infestation of food crops, significantly increased grain prices, market demand for food, epidemics, population displacement and indicators of household food insecurity e.g. reduced diet diversity (number and frequency of consumption of different foods), increasing percentage of household expenditures on food, loss of employment, temporary work, loans from family/friends, early sale of crops and migration to look for work or flee insecurity. When some of these indicators are identified, emergency preparedness measures, such as. prepositioning of emergency food and trained staff to reduce the lead

time required to avert a severe and/or large-scale food and nutrition emergency can be started.

For example, in a drought situation, decreased rainfall followed by a decline in food supply and an increase in food prices are early warning signs of a food emergency. Families might cope by selling their household assets such as livestock and tools to buy grain. Selling critical household assets can eventually lead to a loss of livelihood and displacement.

Nutrition surveillance, the collection of nutrition data for the purpose of taking timely action as needed, is also part of early warning system. Anthropometric indicators of acute and severe malnutrition, however, are late indicators of a nutrition emergency. Therefore, anthropometric indicators are *not* used to predict a nutrition emergency nor to avert excess mortality due to acute malnutrition. This is because the lead time needed to implement emergency food aid before it is effective might be too short to avert excess mortality. However, rates of acute malnutrition are frequently used as critical levels of indicators for taking action or as benchmarks (Table 9.3).

Growth monitoring data are generally not used for nutrition surveillance, but can be used as a source of information during local field assessments when looking for an increase in cases of severe malnutrition at health centres. Growth monitoring is used primarily for individual screening and assessment.

> During the food and nutrition emergency in Ethiopia in 2002-2003, geographic gaps in nutrition surveys early in the emergency missed the developing emergency in one region of the country (SNNPR]).

Table 9-3: Nutrition surveillance benchmarks[42]

Nutrition situation	Recommended actions
Acute malnutrition rate >15% or 10-14% with aggravating factors*	Emergency food aid: general food ration Blanket supplementary feeding Therapeutic feeding of severely malnourished individuals
Acute malnutrition rate 10-14% or 5-9% with aggravating factors*	No general rations Targeted supplementary feeding Therapeutic feeding of severely malnourished
Acute malnutrition rate <10% with no aggravating factors	No emergency food and nutrition intervention

Aggravating factors include the following:[42]

- Household food insecurity;
- High prevalence of HIV/AIDS;
- Crude mortality rate greater than 1/10,000/day;
- Under-five crude mortality rate greater than 2/10,000/day;
- Epidemic of measles or whooping cough (pertussis);
- High prevalence of respiratory or diarrhoeal diseases;
- High prevalence of pre-existing malnutrition, e.g., stunting.

Local assessment

The planning for an emergency food and nutrition response begins with a local field assessment. Assessments are covered in detail in the epidemiology chapter of this book; however, there are a few items that are related only to nutrition assessments addressed here.

The purpose of a local food and nutrition assessment is as follows:

▪ To determine whether an emergency food and nutrition problem exists, including the cause(s) and the magnitude of the emergency (severity of malnutrition, geographic extent and size of the affected population);

▪ To provide recommendations for a course of action to reduce or prevent a food and nutrition emergency based on consideration of the available data and field observations;

▪ To communicate this information to the concerned decision makers and government authorities, both local and national;

▪ To assess local capacity and the capacity of other organisations such as Non-Governmental Organisations (NGOs) and UN agencies (technical resources, infrastructure) to respond.

Local assessment includes assessment of household livelihoods, food security, water supply, sanitation, health care and child feeding practices, the latter as part of a nutrition survey if data are unavailable. Table 9.4 is a data collection checklist.

As noted in the epidemiology chapter, the field visit should involve local travel, observations and interviews. Sources of information include community leaders, local government officials and representatives of key civil society organisations e.g. local NGOs, peasant associations, women's groups and religious groups. Individuals from the affected population, including women because of their central role in providing food for the family and taking care of children, should be involved in the field assessment as well as the planning of the emergency response as much as possible.

Visits should be made to health centres and food distribution points to look for and ask about cases of malnutrition, kwashiorkor and maramus. Observation of an unusual high number of cases of severe malnutrition indicates that a food and nutrition emergency might be underway.

The assessment report should include the following:

Floods in Mexico - Here, aid for 2,000 families had to be flown in. Air lifts like this one have helped sustain nearly 300,000 people with food parcels. Photo: Miguel Rodriguez/ Mexican Red Cross

▪ The geographic area, including normal harvest and rainy seasons (if applicable) and population groups and sizes;

▪ Major livelihood groups and food security situation of each group (food production, livestock and/or sources of income);

▪ Health and nutrition findings;

▪ Determination of whether an emergency exists based on findings. This is a qualitative judgment based on the preponderance of the evidence;

▪ International, national and local capacity to provide food aid and nutrition support;

▪ Any information gaps.

Table 9-4: Local field assessment data collection checklist[42]

Food security of major livelihood groups	Population health and nutrition status
▪ Rumours of famine (yes/no) ▪ Drought or flooding (yes/no) ▪ Major pests causing crop failure (yes/no) ▪ Pre-harvest 'hungry' season (yes/no) ▪ Declining food stocks at household, district and/or national levels (yes/no) ▪ Unusual rise of market prices (yes/no) ▪ Loss of livestock (yes/no) ▪ Loss of livelihood (yes/no) ▪ Increased sale of household assets, livestock or wood for food acquisition (yes/no) ▪ Population displacement to cities/loss of productive land (yes/no) ▪ Degree of poverty (esp. in urban centres)	▪ Frequent observation of adult wasting or kwashiorkor and/or marasmus among children (yes/no) ▪ Reports of increased mortality (yes/no) ▪ Epidemic and endemic diseases such as diarrhoeal diseases and malaria ▪ High prevalence of HIV/AIDS ▪ Prevalence of anaemia ▪ Coverage and access to health services (including payments etc) ▪ Immunisation coverage ▪ Vitamin A supplementation coverage if vitamin A deficiency is endemic in the population ▪ Availability of water and access to potable drinking water and sanitation ▪ Infant and young child feeding practices ▪ Hospitalisations due to AIDS
Local capacity ▪ Presence of government, NGOs, UN agencies ▪ Accessibility and managerial infrastructure: roads, warehouses, hospitals ▪ Communication and coordination	**Security situation** ▪ Armed conflict or civil violence (yes/no) ▪ Banditry (yes/no) ▪ Population displacement (yes/no)

Figure 9-2 shows that nutritional status is determined by immediate, underlying and basic factors. It can be used for a situation analysis of the causes of malnutrition and food intake. Immediate determinants are dietary intake and infections.[C] Underlying factors are care giving practices, household food security and access to health care services, water and sanitation and basic causes are political and economic contextual factors.

Figure 9-2: UNICEF Conceptual framework of the cause's determinants of malnutrition[34]
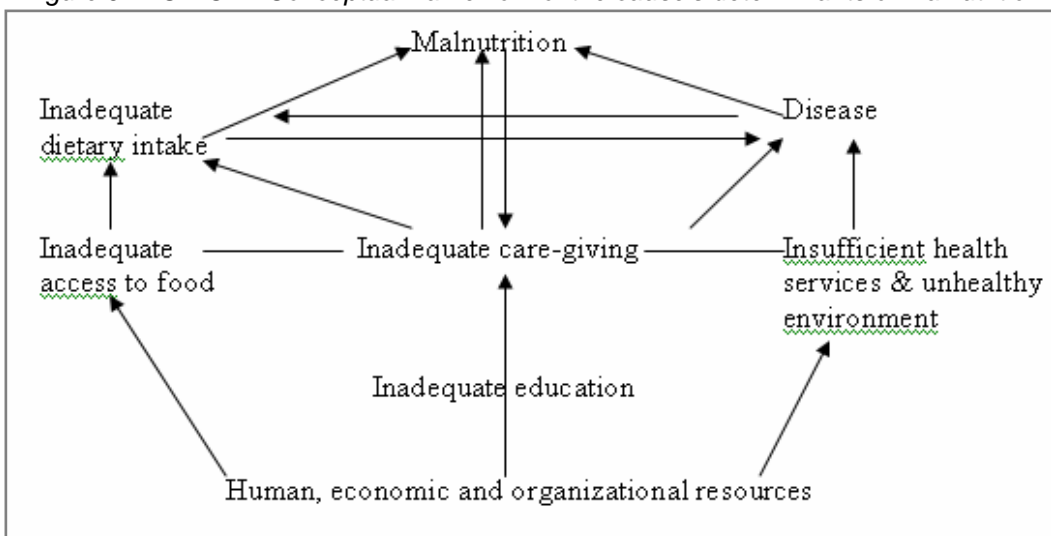
[C] Dietary intake includes intake of macronutrients (carbohydrates, protein and fat) and micronutrients (vitamins and minerals). . . . Macronutrients provide energy and amino acids for synthesis of body proteins. Micronutrients are needed for the normal functioning of the body, including growth, physical activity, development and immunity/protection against disease.

Malnutrition, kwashiorkor and marasmus

The term malnutrition refers to the consequences of a combination of inadequate dietary intake and disease as shown in Figure 9.2.[D] The consequences of inadequate dietary intake and disease are particularly pronounced during periods of rapid growth under the age of five. Among children, malnutrition is manifested by underweight and growth failure: malnourished children are shorter or stunted and thinner or wasted than they should be for their age. Among adults, acute malnutrition is manifested by underweight.[E]

Child underweight (measured by low weight-for-age) is a combination of stunting (measured by low height-for-age) and wasting (measured by low weight-for-height). Stunting is an indicator of chronic malnutrition. Underweight and wasting are indicators of acute malnutrition. Acute malnutrition among children is defined as weight-for-height of less than two standard deviations of the reference population median weight-for-height.

Maramus or severe wasting is one of two forms of severe acute malnutrition. Marasmus is defined as a weight-for-height of less than three standard deviations of the reference population median weight-for-height. **Kwashiorkor** is the second form of severe acute malnutrition. It is defined by the presence of bilateral oedema of the both feet. Children who have kwashiorkor may not appear underweight initially because of their oedema. Clinical signs of marasmus and kwashiorkor are given in Table 9-5.

Table 9-5: Signs of severe forms of acute malnutrition[43]

Type of severe acute malnutrition	Clinical signs
Marasmus	Extreme wasting, little fat or muscle, child's skeleton clearly visible, lack of appetite in complicated casesa.
Kwashiorkor	Oedema of both feet; thin, sparse and pale hair that falls out easily, dry scaly skin especially on the arms and legs, a puffy or moon face, apathy.

Kwashiorkor, characterised by moon face and scarce, pale hair Photo: J Pierre-Louis, UNHCR, 2004.

a) Complicated and uncomplicated cases are described in the Therapeutic Feeding Protocol and under Community Therapeutic Care.

b) The thumb is pressed gently for a few seconds on the top side of each foot; if a dent remains when the thumb is removed, the child has oedema.

When one speaks of malnutrition during a food and nutrition emergency, people are generally referring to rates of wasting/acute malnutrition and severe malnutrition. However, malnutrition during an emergency encompasses micronutrient deficiencies and stunting/chronic malnutrition as well as acute malnutrition.

In non-emergency situations in developing countries, the prevalence of acute malnutrition/wasting in children under five is about 5% with only sporadic cases of severe acute malnutrition. In a nutrition emergency, the prevalence of acute malnutrition and of severe malnutrition increases significantly; **the prevalence of acute malnutrition, including severe acute malnutrition, can be** 10% to 15% among

[D] Dietary intake includes intake of macronutrients (carbohydrates, protein and fat) and micronutrients (vitamins and minerals). . . . Macronutrients provide energy and amino acids for synthesis of body proteins.... Micronutrients are needed for the normal functioning of the body, including growth, physical activity, development and immunity/protection against disease.

[E] Defined as a Body Mass Index (kg/m2) of less than 18.5

children under five; the prevalence of severe malnutrition may be as high as 2% to 3% among children under five[F] Older children, adolescents, adults and the elderly can also be acutely malnourished, but are less likely to show wasting to the extent that young children do.

High rates of chronic malnutrition or stunting and underweight in children under five in the affected population before the emergency indicate a high level of pre-existing malnutrition and greater vulnerability to acute malnutrition and risk of mortality. Severe malnutrition will be more prevalent and lead to higher death rates if the affected population had high rates of malnutrition before the onset of the emergency e.g. high levels of stunting and/or vitamin A deficiency.

Pregnant women are also vulnerable to acute malnutrition. Maternal underweight is a risk factor for low birth weight and increases the risks of maternal mortality.

Nutrition surveys

A nutrition survey, a cornerstone of nutrition surveillance, can either precede or follow a local field assessment.

The purpose of nutrition survey findings is to:

▪ Identify emergency affected populations and confirm the occurrence of a food and nutrition emergency. If it precedes a local field assessment, it can signal a food and nutrition emergency. If it follows a local field assessment, it can confirm a food and nutrition emergency;

▪ Estimate the number of malnourished individuals, the kind of malnutrition and target the most vulnerable populations for intervention. It is essential to standardise nutrition survey methods so that findings can be compared to findings of surveys in other areas and over time (see Tables 9-6 and 9-7);

▪ Monitor the adequacy of food and nutrition emergency interventions and improvement in the nutritional status of the affected population. The first survey in an area can be used as a baseline.

The **survey report** should present the acute malnutrition rate, the severe acute malnutrition rate and the prevalence of kwashiorkor in order to discuss the real situation about household food security, public health, child feeding practices and humanitarian assistance based on the information collected during the local field assessment. The findings should be communicated as soon as possible to both local and national authorities.

Weight and height are used to assess malnutrition in both individuals and populations. Acute malnutrition rates in children six to fifty-nine months of age are used as an **indicator of nutritional status** of the target population. Survey data should be collected from a representative, cross-sectional population sample of households with children six to fifty-nine months of age. If a child's age is unknown, the cut-off for inclusion in the survey is a height of 110 cm. Training and supervision is needed to ensure accurate and reliable measurements. The weights and heights or lengths of all children in the target age group in the households sampled are measured.[G]

Marasmus, severe wasting of body fat and muscle
Photo: J Pierre-Louis, UNHCR, 2004

[F] The term, global acute malnutrition or GAM, is sometimes used. . . . It includes both acute malnutrition and severe malnutrition.
[G] The height of children age twenty-four to fifty-nine months (or 85 cm or greater) is measured. . . . The length of children under twenty-four months or less than 85 cm is measured. . . . Height is measured with the child standing up and length is measured with the child lying down. . . . .

Table 9-6: Standard height/length and weight measurements of children under five

Measurement	Procedure
Length	For children less than 85 cm or two years of age, length is measured. The measuring board is placed on the ground with the child lying in the middle. An assistant holds the child's head and positions it to touch the headboard. The measurer places his hands on the child's legs and gently stretches the child, keeping one hand on the child's feet. The foot plate must be perpendicular to the board when the measurement is read. Length is measured to the nearest 0.1 cm.
Height	For children greater than 85 cm or two years of age, height is measured. The measuring board is placed upright on level ground. The child stands upright against the measuring board. The child's head, shoulders, buttocks, knees and heels should touch the backboard while the measurer places the headboard firmly on the child's head. The child's line of sight should be straight ahead. Height is measured to the nearest 0.1 cm.
Weight	A 25-kg hanging Salter scale is generally used. Weighing pants are suspended from the lower hook and the scale is adjusted to zero. The child's clothes should be removed and the child placed in the weighing pants and then hung freely from the hook. When the child is still, the weight is recorded to the nearest 100 g with the scale at eye level. If the child is moving, the weight can be estimated at the midpoint of the range of oscillations.

Weight-for-height, as an indicator of acute malnutrition or wasting in children from six months to five years of age, is compared to international reference standards and expressed as a z score. **Weight-for-height z score** is the weight of the child compared to the median and standard deviation of the reference weight for the child's height.[H] Weight-for-height z scores can be calculated by hand or by using a statistical programme such as Epi Info.

Z scores are used to present survey data while **percentage of the reference standard** is used for assessing individual children for admission and discharge from therapeutic or supplementary feeding.

For the assessment of a population's nutritional status in an emergency situation, other anthropometric indicators such as height-for-age z score (an indicator of stunting or chronic malnutrition) and weight-for-age z score, which is an indicator of underweight that conflates stunting and wasting, are neither needed nor recommended. For both of these standard indicators, accurate determination of the child's age is required, which can be difficult to determine because birth registration is not universal in some populations.

New WHO standards for length/height-for-age, weight-for-age and weight-for-length/height are now in use and replace the earlier WHO/National Centre for Health Statistics reference standards used since the 1970s. The new standards are based on the growth of healthy children living in Brazil, Ghana, India, Norway, Oman and the United States under conditions likely to favour their full genetic growth potential, including exclusive breastfeeding. The reference standards are available at http://www.who.int/childgrowth/standards/en/.

[H] Anthropometric indices can be expressed as:

Percent of reference % WFH = $\dfrac{\text{weight}}{\text{median reference weight-for-height}}$ x 100
Weight-for-height (WFH)

Standardised weight- WFH = $\dfrac{\text{(weight – median reference weight-for-height)}}{\text{standard deviation of reference weight-for-height}}$
For-height or z score

In addition to measurement of weight and height, cases of kwashiorkor and vitamin A or iron deficiency on the basis of clinical observations observed in the sample population should be noted.

Other age and gender groups at nutritional risk e.g. **breastfeeding women or the elderly** can also be included in the survey if there is reason to believe that these groups are at high risk and if specific interventions for instance, supple-mentary feeding is planned for these groups. **Body Mass Index** (BMI) is used for measuring acute malnu-trition in adults.[I] An adult BMI less than sixteen indicates severe wasting.

Low birth weight which is a birth weight under 2.5 kg can indicate maternal underweight before and during pregnancy as well as an increased risk of infant mortality. Accurate and objective data on birth weight is difficult to obtain when a significant proportion of births takes place in the home. Low-birth-weight data from maternity records also tend to give a biased estimation of low-birth-weight prevalence. If birth weight data is collected, its prevalence should be estimated for live births during the preceding twelve months. Low birth weight can be estimated by asking a new mother whether her last newborn was big, average or thin.

Mid-Upper-Arm Circumference (MUAC), which measures fat and muscle in the mid-upper arm, is sometimes used for rapid assessments and screening for therapeutic feeding of individuals. MUAC of the left arm

A child is weighed to check for malnutrition at a mobile clinic at the Red Cross camp in Tahoua, Niger. Photo: Bruce Liron/British Red Cross

should be measured. For children, a cut-off value of <12.5 cm should be used for children under five to indicate acute malnutrition and referral for further evaluation. For pregnant and breastfeeding mothers, the cut-off value is 22 cm. Measurement of Mid-Upper-Arm Circumference is prone to measurement error and inaccurate assessment of nutritional status and therefore it is not recommended for nutrition surveys.[J]

Standard **sampling methods** are described in Table 9-7. A cluster sample of 900 children is generally used (thirty clusters and thirty children per cluster). Sample clusters are selected by proportional-to-population sampling and a random sample of thirty households is selected in each sample cluster.

[I] If BMI is used for unusually tall populations, height measurements should be corrected for sitting height by measuring sitting height in a sub-sample of the target population.
[J] MUAC is taken on the left arm with the arm hanging down the side of the body and relaxed. . . . MUAC is measured at the mid-point between the shoulder and the tip of the elbow. . . .

Table 9-7: Standard survey sampling methods[4]

Sampling method	Description
Cluster sampling	Clusters of the population such as communities or neighbourhoods are selected and sample households and children within the cluster are selected for the survey.
Population proportional to size sampling	Clusters and population sizes are listed with cumulative population sizes in a third column. The total cumulative population size is divided by 30 to get n. A number between 1 and n is randomly selected and the cluster with the cumulative population closest to this number is selected. Add n to the random number and select the second cluster closest to but not exceeding the sum of n and the random number. Continue in this manner until 30 clusters have been selected.
Random sampling	A random starting point is selected in each cluster and every household with children under five is visited, moving in a randomly selected direction.

Estimating mortality rates

Nutrition surveys are sometimes used to collect data on mortality rates. For children under five, the following standardised questions in interviews of caregivers can be used:

- Have you ever given birth?
- (If yes) When was your most recent birth?
- (If less than five years ago) Where is this child now?
- (If dead) Did this child die before or after the start of (the emergency period)?

An under-five crude mortality rate greater than 2/10,000/day is elevated and cause for concern.

Infant and young child feeding practices

Nutrition surveys are also used to collect information on infant and young child feeding practices. Standard indicators are described in Table 9-8.

Table 9-8: Standard indicators of infant and young child feeding practices[43,50,]

Indicator	Question
Exclusive breastfeeding rate, less than six months	'What did the child eat yesterday?' Interviewer: Exclusive breastfeeding is breast milk and medicine only; no water or teas. Use a checklist of frequently consumed foods including breast milk.
Complementary feeding rate, six to eight months	'What did the child eat yesterday?' Interviewer: Complementary feeding includes breast milk and other liquids and semisolid and solid foods. Use a checklist of frequently consumed foods including breast milk.
Breastfeeding rate, twenty to twenty-three months	'What did the child eat yesterday?' Interviewer: Use a checklist of frequently consumed foods including breast milk.

Indicator	Question
Percentage of children consuming the recommended number of meals and snacks per day, six to twenty-three months	'What did the child eat yesterday?' Interviewer: Besides breastfeeding, note the number of times the child was fed.
Percentage of children sick in the past two weeks who continued breastfeeding and feeding foods other than breast milk	'Was the child ill in the past two weeks?' Interviewer: If yes, ask, 'Did the child breastfeed more, less or the same?' 'Did the child eat more, less or the same amount of other foods?'

> A national coordinating body in Ethiopia oversees and ensures the implementation of emergency nutrition surveys using standardised methods. The survey findings conducted by NGOs throughout the country are compiled at the national level and incorporated into a national nutrition surveillance system.

Emergency food aid response

General food ration distributions should be introduced only when absolutely necessary, targeted to those most in need but discontinued as soon as possible. The aim of the emergency food aid response is to deliver timely an adequate quantity and quality of food to the affected population to reduce the risk of acute malnutrition and mortality so that communities, households and individuals can survive and recover from the emergency situation. Implementing adequate food aid early in combination with public health measures will maintain the nutritional status of the affected population.

General Food Ration (GFR)

The aims of the General Food Ration are:
- To ensure that emergency affected populations have adequate food intakes; and
- To reduce the risk of acute malnutrition and mortality.

GFR bridges the gap between the population's requirements and their own food resources from market trading, wage labour, garden plots, community sharing, food stocks, small livestock etc. The same ration is given to every member of the household regardless of age or individual need.

The **food basket** for the GFR consists of food commodities in sufficient quantities to meet a family's basic nutritional requirements and provide a buffer against shortages or spoilage. Adequate fuel, cooking utensils, mills and other grinding facilities must also be available to assisted households and communities.

Some **bartering and trading** of food aid and sale of small livestock to the local population to buy other foods should be expected to a certain degree and should not be discouraged; refugees typically set up marketplaces in camps. Bartering and trading generally improves dietary diversity and quality and provides income to buy essential non-food items such as clothes or soap. Trading foods does not mean that beneficiaries do not need all the rations. More expensive foods that give higher returns are more likely to be traded while cheaper foods are more likely to be consumed by beneficiaries.

The basic **food basket/general food ration** includes the following:
- A culturally acceptable staple food such as maize, wheat, rice, millet, sorghum or oats

- A pulse or legume, which is a source of complementary protein such as lentils, beans, peas or peanuts (groundnuts);
- Red palm oil (a natural rich source of vitamin A), vitamin A fortified vegetable oil such as groundnut, Soya, sunflower, rapeseed oil;
- A fortified blended food and the main one distributed by the World Food Programme is Corn-Soy Blend;
- Iodised salt.

Sugar and locally available meat or fish can also be part of the food basket.

Where possible, the food basket should also include locally available and culturally acceptable foods such as fruits, vegetables, condiments/spices, tea and coffee in order to add nutrients, taste and variety to basic foods, to increase the palatability, familiarity and acceptability of prepared foods and for the preparation of cultural/traditional foods and dishes. Populations generally will not consume a monotonous diet of three commodities (e.g., wheat, beans and oil) for months at a time (see Table 9-9 below).

Dried Skim Milk (DSM) should not be part of the food basket and should not be distributed to the population because of the high risk of contamination when prepared with unclean water or under unsanitary conditions because of the danger DSM poses for young children in particular. The only safe use of DSM is for therapeutic feeding under strict supervision. Breast milk substitutes should be used only in very exceptional circumstances and when provided as generic, non-brand formula. The **International Code of Marketing of Breast-milk Substitutes states**:

- No donations of breast-milk substitutes, bottles or teats should be given to any part of the health care system and donations made to institutions outside the health care system to infants who have to be fed on breast-milk substitutes should be continued as long as the infants concerned need them.

Table 9-9 presents five examples of General Food Rations that meet minimum energy, protein, fat and micronutrient requirements and that provide about 2,100 kcal, which is the established international average minimum energy requirement.

Table 9-9: General food rations (grams)[32]

Food item	1	2	3	4	5
Cereal	400	450	350	400	400
Pulses	60	60	100	60	50
Vitamin A fortified oil	25	25	25	30	30
Fortified blended foods	50	40	50	40	45
Iodised salt	5	5	5	5	5
Sugar	15		20		25
Fish/meat		10		30	

The rations given in Table 9-9 provide 10% to 12% of total energy from protein and approximately 17% of total energy from fat and the micronutrients listed in Table 9-10. Micronutrient deficiencies can result from an inadequate intake of these vitamins and minerals.

Table 9-10: Daily vitamin and mineral requirements for emergency food aid[41]

Nutrient	Requirement/person/day	Disease
Vitamin A	500 µg Retinol equivalents or 1,666 international units	Xerophthalmia
Thiamine (B1)	0.9 mg	Beriberi
Riboflavin (B2)	1.4 mg	
Niacin (B3)	12.0 mg	Pellagra
Folic acid	160 µg	
Vitamin C	28.0 mg	Scurvy[glo7]
Vitamin D	3.8 µg	
Iron	22 mg	Anaemia
Iodine	150 µg	IDD (goitre)

The Food Basket Calculator (FBC)

The International Federation (with the support of Nestlé Research Center, Lausanne, Switzerland) has developed a software that easily calculates the energy, protein, vitamin and mineral contents of food available worldwide. It is helpful during the actual emergency to ensure the distribution of rations of 2,100 kcal//day/person. FBC is useful during the more long term assistance when vitamins and micronutrients are becoming more and more important. It is adapted to operational issues often seen in the field where some basic foods are provided by the World Food Programme and other international organizations, whilst other suitable and locally available foods, fruits and vegetables can be found to create a full food and healthy food basket. Furthermore, FBC can be used to establish special diets for special vulnerable groups and supplementary feeding.

Prevention of micronutrient deficiencies

Micronutrient deficiencies often coexist with acute malnutrition and lead to severe disorders and death. Epidemics of pellagra and beriberi as well as scurvy have occurred in situations in which food aid beneficiaries were totally dependent on food aid. These three deficiency diseases, pellagra. beriberi and scurvy have occasionally re-emerged in emergencies in the past two decades. Vitamin A and iron deficiencies are widely endemic public health nutrition problems that can also be exacerbated by food emergencies. Displaced and camp populations where the only source of food for long periods is food aid (e.g. one type of staple, beans and vegetable oil) are at especially high risk of developing micronutrient deficiencies. If clinical cases are reported, there are generally many more sub-clinical cases.

Because of the risk of these specific micronutrient deficiencies, the minimum daily requirements of essential vitamins and minerals must be ensured in the diet of populations who are fully dependent on food aid. This action prevents clinical micronutrient deficiencies and correct sub-clinical micronutrient deficiencies as follows:

- Oil should always be fortified with vitamin A;
- Iodised salt should always be distributed;
- Fortified blended foods or fresh foods rich in micronutrients must be included in food baskets of grain and oil to provide adequate vitamins and minerals in the diet; examples of blended foods are Corn Soy Blend, Unimix and Famix;
- If feasible, the target population should produce vegetables and fruits;

- ▪ If feasible, the target population should trade in food including food aid, none of which should be discouraged, Such trade increases dietary diversity and the overall adequacy of the diet;
- ▪ Vitamin A supplementation of preschoolers and postpartum women in vitamin A endemic populations is recommended;
- ▪ If dried skim milk is provided for wet feedings etc., it has to be fortified with Vitamin A.

Iron deficiency anaemia is the most widespread nutritional problem in the world. Iron deficiency is the main cause of anaemia; malaria, hookworm, schistosomiasis, other vitamin deficiencies such as vitamin B12, folic acid and vitamin A and medical conditions such as thalassaemia and sickle cell anaemia which might also contribute to anaemia in a population. **Anaemia** is diagnosed by low haemoglobin concentration levels or pallor of the skin and inner eyelids. Iron deficiency increases maternal and infant mortality, impairs cognitive development and learning and decreases physical work capacity. Young children and women of reproductive age are especially vulnerable. Diets that are high in grains and low in meat are generally low in iron because the bio-availability of iron in grains and plant foods as well as eggs and dairy products (**nonhaeme iron**) is much lower than the bio-availability in meat (**haeme iron**). The bio-availability of nonhaeme iron is increased by consuming foods containing haeme iron as well as fruits and vegetables rich in vitamin C and beer especially because it is fermented. Other foods that decrease the bio-availability of nonhaeme iron include tea, coffee, nuts, beans and maize. See section on Treatment of Severe Anaemia.

Vitamin A deficiency is a major public health problem in developing countries and a major contributing factor to the mortality of young children in emergencies. Clinical signs are night blindness, corneal lesions, nutritional blindness (xerophthalmia), increased childhood morbidity and mortality, particularly from measles and diarrhoea. Young children and pregnant women are especially vulnerable. Supplementation to prevent deficiency is recommended when deficiency is widespread. Fortified oil, blended foods, orange fruits and vegetables (mango, papaya, carrot, squash and sweet potato), eggs, dried fish and dark green leafy vegetables are rich food sources of vitamin A. See section on vitamin a supplementation.

Pellagra is caused by niacin (vitamin B3) deficiency and occurs among populations that consume maize (corn) as the staple cereal. Clinical signs are dementia, diarrhoea and dermatosis of exposed skin. Blended foods, peanuts (groundnuts), pulses, offal and dried fish are rich food sources of niacin.

Beriberi is caused by thiamine (vitamin B1) deficiency and has been observed in refugee populations consuming polished white rice as the staple cereal. Clinical signs of 'dry' beriberi are neuritis and limb paralysis; the sign of 'wet' beriberi is oedema, which can lead to cardiac failure. Thiamine deficiency has most often been observed in emergencies in southeast Asia. Parboiled rice, pulses, nuts, vegetables, eggs and brewers yeast (from beer made with fermented cereals) are rich food sources of thiamine.

Scurvy is caused by vitamin C deficiency. Outbreaks of scurvy tend to be more localised than epidemics of pellagra and beriberi. Clinical signs are poor wound healing, bleeding gums, fatigue, leg pain and a rash on the legs. Scurvy is not life-threatening. Blended foods and fresh fruits (guava, papaya, citrus and mango) and vegetables (peppers, tomatoes, cabbage, potatoes and green leafy vegetables) are rich food sources for vitamin C.

Iodine deficiency disorders do not occur as a result of emergencies, but might be endemic in the population, especially where there is no iodised salt or salt that can be inadequately iodised. Clinical signs are goitre (an enlarged thyroid gland) and impaired cognitive development that especially affects the foetus. Females suffer from goitre more frequently than males. Iodised salt is the best food source of iodine.

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▪ Low or poor coverage of the target population-In a large emergency, especially when the population is scattered over a large geographical area, some subpopulations or pockets might be overlooked. Identifying and reaching all vulnerable households and communities can be difficult when the population is large or dispersed. Increasing the number of distribution points for food aid can also help. Nutrition surveys of neglected areas should be conducted;

▪ Beneficiary dependency on food aid-Displaced populations can become fully dependent on food aid. Food aid should be provided in a decentralised manner to discourage population displacement or concentration;

▪ Failure in the pipeline or interruption in one or more commodities in the food pipeline-Missing food commodities need to be temporarily replaced with other food items using the substitution ratios in Table 9-11.

Table 9-11: Substitution ratios for common food items[32]

Blended food for beans	1:1
Sugar for oil	2:1
Cereal for beans	2:1
Cereal for oil	3:1

An adequate food pipeline does not guarantee that food will be equitably distributed to all needy households. The food aid distribution system must be:

▪ **Transparent** - The target population should have information about the rations, the timing and distribution of which should take place in a public place;

▪ **Fair** - Rations are based on need and household size;

▪ **Accountable to beneficiaries** - Distribution should take into account the social, ethnic and political divisions within the target population;

▪ **Accountable to donors** - Reports of food distributed and numbers of beneficiaries must be provided on a regular basis and external monitors present during distribution;

▪ **Gender-sensitive** - Women must be allowed to collect food, be represented on food committees and never placed at risk.

In stable situations, existing government structures are the first choice for the distribution of food aid because information, administration and transport networks are already in place. In emergencies associated with conflict, it might not be appropriate for government structures or local/traditional leaders to distribute food aid. In conflict situations, NGOs distributing food aid should:

▪ Have food distribution experience;

▪ Work in the geographic area of operation;

▪ Be able to mobilise staff quickly;

▪ Maintain neutrality.

Registration of the target population should be completed as soon as possible and kept up-to-date. In the first stages of an emergency especially if there is population displacement, the number of beneficiaries can change quickly. Registration of vulnerable households such as households affected by HIV/AIDS and female-headed households or politically marginal groups should be given special attention. Food aid can be distributed directly to households, ration cards with family size and address issued. Alternatively, food aid can be distributed in bulk to groups in which households are informed of their entitlements and in which distribution is done by the group within the group.

Rations can be distributed weekly, biweekly or monthly depending on security and the target population's dispersion. Rations must not be too heavy to carry over long distances. UNHCR recommends one distribution site for 20,000 persons and a maximum travel distance of five to ten kilometres.

Supplementary feeding

Supplementary feeding is not a substitute for inadequate general rations and should always be considered in the context of the general food ration. Supplementary feeding programmes include the following:

- **Blanket supplementary feeding** is a stopgap measure to prevent the deterioration of high-risk groups' nutritional status such as children under five, pregnant women, lactating women, HIV/AIDS affected families and the elderly. In emergency situations, the World Food Programme, UNHCR and implementing agencies work to ensure the timely provision of an adequate general food ration. Nevertheless, supplementary food might be needed for a certain period for subpopulations who are either already malnourished or at high risk of becoming malnourished. Blanket supplementary feeding is to be considered for instance at the beginning of a food emergency when the food pipeline for the general food ration is still inadequate;

- **Targeted supplementary feeding** is for acutely malnourished children from six months to five years according to set cut-off criteria (Mid-Upper-Arm Circumference < 12.5 cm or weight of 70% to 79% weight-for-height); for pregnant women in the second or third trimester of pregnancy; lactating women up to six months postpartum; adults who are severely malnourished based on Body Mass Index (BMI <16); and the **elderly**. A specific group giving major concern is families affected by HIV/AIDS. The purpose of targeted supplementary feeding is to prevent severe acute malnutrition among the moderately malnourished and to limit the need for widespread therapeutic feeding among children in particular. Targeted supplementary feeding is often implemented on a limited scale;

- **Supplementary feeding linked to therapeutic feeding** is for children discharged from therapeutic feeding but are still moderately malnourished. Children are generally discharged from these supplementary feeding programmes when they reach 85% of median weight-for-height and maintain this weight for two successive weighing.

When information about the prevalence of acute malnutrition is lacking in a nutrition emergency, planning figures of 15% acute malnutrition among children under five can be used to estimate supplementary food requirements for these children.

For example:

For an emergency affected population of 30,000	
Estimated number of children aged less than five years (15% to 20%)	4,500 to 6,000
Estimated number of moderately malnourished children (15%)	675 to 900

For supplementary food interventions targeting pregnant or breastfeeding women, the percentage 2.5% can be used to estimate the percentage of pregnant women among the total population; 2.5% can also be used to estimate the percentage of breastfeeding mothers among the total population.

Table 9-12 presents examples of rations for supplementary feeding.

Table 9-12: Supplementary feeding rations (g) (10-15% of kcal from protein and 30% of kcal from fat)[41]

Food commodity	Take-home daily dry ration		On-site daily wet ration	
	1	2	3	4
Blended fortified food	200	250	75-100	-
Cereal				125
Pulse				30
Oil, fortified with vitamin A	20	25	15-30	20
Sugar	15	20	10-20	
Salt, iodised				5

Dry rations for home preparation should be provided whenever possible. **Wet rations** (cooked food) should be limited to situations following a major disaster when people do not have the means to cook for themselves or when the distribution of dry rations could put them in danger for instance while walking home. Take-home supplementary food dry rations provide 1,000 to 1,250 kcal/person/day while on-site feeding or wet rations provide 500 kcal/person/day.

The preparation of supplementary food must be culturally appropriate to be palatable and include locally available foods. The World Food Programme has collected recipes from around the world using fortified blended food to prepare staple foods such as pancakes,[K] thick porridge[L], thin porridge[M], and unleavened bread[N].

High-energy biscuits (called BP5 and BP100) are sometimes used for supplementary feeding when fortified blended food or cereal/pulse blends are not available. The biscuits should be dissolved in water if used for feeding young children. High-energy biscuits are inappropriate for children recovering from severe malnutrition and should not be used in therapeutic feeding. High-energy biscuits can, however, supplement the diets and energy intakes of pregnant women in their second trimester to reduce the incidence of low birth weight.

Table 9-13 summarises the criteria for starting and closing supplementary feeding programmes.

Table 9-13: Criteria for opening and closing emergency supplementary feeding[31]

	When to open	When to close
Blanket supplementary feeding	At onset of an emergency, before the food pipeline and general food ration are improved and sustained.	When the food pipeline and general food ration distribution are adequate.
	Outbreak of scurvy, beriberi or pellagra in the target population.	When there are no cases of scurvy, beriberi or pellagra in the target population.

[K] Enjira (Ethiopia), kamja jijim and koguma jijim (Korea), kisera (Sudan), lahoh (Somalia), uttapam (India).
[L] Banku (Ghana), madida (Sudan), nsima (Malawi), ubhugali (Burundi), ugali (Tanzania).
[M] Bouillie (Senegal), bubur (Indonesia), shooro (Somalia/Ethiopia).
[N] Drabeel, karapeech or youkeh (Middle East/North Africa), roti or chapati (Afghanistan, Bangladesh, India, Nepal, Pakistan, Yemen). . . .

Targeted supplementary feeding	To prevent deterioration in the nutritional status of vulnerable groups in the population (children under five, pregnant women, lactating women, families affected by HIV/AIDS, the elderly) and when there is a need for large-scale therapeutic feeding.	When the prevalence of global acute malnutrition is stable or declining.
Supplementary feeding linked to therapeutic feeding	When there are too many severely malnourished individuals to be treated adequately in existing health care facilities.	When the number of severely malnourished cases decreases to a number that can be adequately treated in clinics or hospitals.

Infant and young child feeding in emergencies

Beyond the provision of foods, programme strategies to reduce malnutrition and mortality and to improve child growth through the promotion of appropriate infant and young child feeding practices are often overlooked. Infant and young child feeding practices include breastfeeding, complementary feeding, psychosocial care and nutritional care of sick and malnourished children, personal hygiene and food safety both in the home and at therapeutic and supplementary feeding sites. Infant and young child feeding practices can be improved through education, counselling and the active involvement of caregivers in child feeding.

In food emergencies, **breastfeeding** can be life-saving. Outbreaks of diseases such as diarrhoeal diseases and malaria with conditions of poor sanitation and inadequate access to water make breastfeeding the safest and only practical choice for feeding infants and young children. Health care workers from cultures where breastfeeding is not the norm and who lack basic breastfeeding information and management skills need to be trained Key breastfeeding information and messages are given in Table 9-13. Recommendations to promote and support breastfeeding in emergencies are summarised in Table 9-14.

Complementary foods are non-breast-milk foods. Appropriate complementary feeding is:

 Timely -Complementary foods are introduced at about six months of age.

▪ Adequate - Complementary foods provide adequate energy, protein and micronutrients to meet the growing child's needs.

Nutritional care of sick and malnourished children includes the use of Integrated Management of Child Illness protocols for assessment and treatment, continued feeding during illness and increased variety, frequency and amounts of food during convalescence.

Psychosocial care giving means that the caregiver actively helps her child to eat while remaining sensitive to the demands of the child; she is patient and allows the child to eat at its own pace, verbally encourages the child to eat without force feeding and allows it to try different foods if it refuses to eat.

Personal hygiene and **food safety** mean that foods are stored, prepared and fed with clean hands; utensils and baby bottles are not used.

Caregivers should receive sound information and counselling at health, therapeutic and supplementary feeding centres about breastfeeding and appropriate complementary foods including fortified foods[O]. Mother-to-mother support groups and peer counselling should be promoted for community outreach.

[O] ***Counselling*** is the process of providing guidance to assist an individual in adjusting food consumption to meet needs. . . . Counselling skills include listening, empathy, providing sound

For mothers who test negative or do not know their **HIV status**, antiretrovirals and exclusive breastfeeding for the first six months of life can prevent mother-to-child transmission of HIV. Providing antiretroviral prophylaxis (e.g. Niverapin) to HIV-positive pregnant women and to babies at birth can cut the risk of transmission by half. The risk of HIV transmission for more than one year is between 10% to 20%. This needs to be balanced against the risk of increased morbidity and mortality due to diarrhoeal and other diseases when infants are not breastfed. The risk of HIV transmission by exclusive breastfeeding for six months (with no water, infusions or non-breast milk foods) is nearly zero.

For women to make appropriately informed choices about infant feeding, the availability of counselling and testing is crucial. For infants born to known HIV-positive mothers, adequate replacement feeding is recommended. Replacement feeding however, which includes infant formula for young infants, must be acceptable, feasible, affordable, sustainable and safe.

In many emergencies, the majority of women do not know their HIV status. WHO policy on breastfeeding and infant feeding are:[51]

▪ Exclusive breastfeeding should be protected, promoted and supported for six months. This applies to women who are known not to be infected with HIV and for women whose infection status is not known;

▪ When replacement feeding is acceptable, feasible, affordable, sustainable and safe, the avoidance of breastfeeding by HIV-infected mothers is recommended otherwise, exclusive breastfeeding is recommended during the first months of life;

▪ To minimise HIV transmission risk, breastfeeding should be discontinued as soon as feasible, taking into account the individual mother's situation and the risks of replacement feeding, including malnutrition and other infections.

It is important that replacement feeding, advised as one option for feeding infants of HIV-infected mothers, does not 'spill over' to the general population as an option for all infants.[32]

Table 9-14: Breastfeeding messages during emergencies[12]

1. Nearly every woman can breastfeed her baby;
2. Breast milk has everything the baby needs for the first six months of life;
3. Breastfeeding protects against infections, especially diarrhoea and acute respiratory infections;
4. Breastfeeding is cost-effective;
5. Malnourished and traumatised mothers can produce adequate quantities of breast milk;
6. Hormones released during breastfeeding help to relax the mother and counteract stress.

Table 9-15: Recommendations to promote and support breastfeeding in emergencies[12]

1. All breastfed infants in emergencies should continue to be breastfed;
2. Infants should be exclusively breastfed until six months of age and beyond if safe (uncontaminated) complementary foods are not available;
3. Infants should continue breastfeeding alongside complementary feeding into the second year of life;
4. At least one member of each humanitarian field team should have breastfeeding

information, support and helping the individual decide what to do. . . . .

> management skills to help mothers breastfeed, including:
>
> - Positioning and attachment of the baby to the breast;
>
> - Keeping mothers and babies together and letting them sleep together;
>
> - Frequent nursing (eight to twelve times in twenty-four hours);
>
> - Exclusive breastfeeding for the first six months of life;
>
> - Avoidance of bottles and pacifiers;
>
> - Expression of milk and feeding by cup for babies unable to suckle;
>
> 5. Access to lactation expertise for training and non-routine breastfeeding situations;
>
> 6. Restriction of donations of breast milk substitutes and supplies for bottle-feeding. Donations to must adhere to the terms of the International Code of Marketing of Breast-milk Substitutes;
>
> 7. Relactation when breastfeeding has not started or has stopped prematurely. There must be an exceptional availability of breast milk substitutes for babies during the transition;
>
> 8. Public relations with the media and quick response when the media report that emergencies compromise a mother's ability to breastfeed her baby.

Emergency nutrition intervention response

The need to set up therapeutic feeding programmes after the initial stage of an emergency signals that the emergency food response has been insufficient and/or that the nutritional status of the target population before the emergency was poor. It also signals that aggravating factors such as HIV/AIDS are present or that an infectious disease epidemic is occurring. Populations in a nutrition emergency require life-saving measures that address the immediate and underlying causes of malnutrition. More effort should be directed toward preventing the suffering of young children who deteriorate to such an extent that they need therapeutic feeding and urgent medical care.

The main emergency nutrition interventions are therapeutic feeding and vitamin A supplementation. Untreated, the risk of death is high in cases of marasmus, kwashiorkor and severe vitamin A deficiency (xerophthalmia). The cardiovascular system, the liver, the genitourinary, gastrointestinal and immune systems, the regulation of glucose metabolism, basal metabolism and temperature regulation and the regulation of cellular electrolytes and glands of the severely malnourished patients are critical. While severe malnutrition is reversible and **case fatality** rates can be low (under 10%), if medical staff are well-trained, some children in therapeutic feeding centres have underlying infectious diseases such as measles, TB and HIV/AIDS (up to 15% to 20% of cases in therapeutic feeding centres). They do not survive.

Severe malnutrition is expensive in terms of supplies and human resources. The staff of a therapeutic feeding centre could include one programme coordinator, one medical doctor or medical care nurse, two nurses or assistants for phase one of treatment, two nurses or assistants for phase two, one feeding assistant for every ten inpatients, two cooks (day and night), community outreach workers, one storekeeper, cleaners and two guards (day and night). Training or retraining medical staff in therapeutic feeding is generally needed because staff that worked in earlier emergencies and institutional memory can be lost. Wherever possible, programmes should build on and strengthen existing capacity of national health facilities and hospitals to treat severe malnutrition.

Therapeutic feeding centres should be located as close as possible to the communities they serve in order to discourage displacement. The proximity also reduces the transit time for family members bringing malnourished children for feeding and allows caregivers to be educated and at the same time to participate in the care of their child and

9

help decrease the default rate. There can be time conflicts for mothers wishing to comply with therapeutic as well as supplementary feeding programmes including time lost for domestic work and the care and protection of other children and the household.

Treatment of **complicated cases of severe malnutrition** consists of two phases and a transition phase between phases one and two. It takes place in Therapeutic Feeding Centres (see Therapeutic Feeding Protocol). Community-Based Therapeutic Care is the outpatient management of uncomplicated cases of severe malnutrition such as children with no sign of infection, who still have good appetites, no oedema and do not require a nasogastric feeding tube. See community therapeutic care.

> A national training programme in therapeutic feeding was undertaken in Ethiopia in 2002 to 2003 to build national and NGO capacity to provide high-quality therapeutic feeding.

Therapeutic feeding protocol

The therapeutic feeding protocol is for complicated cases and children six months of age and older[P].

Admission-Percentage of the reference standard is used for assessing individual children for admission and discharge from therapeutic and supplementary feeding[Q]. Less than 70% of median weight-for-height international reference standards are the criterion used for admission to therapeutic feeding. Ideally, a child accompanied by a caregiver is admitted to a therapeutic feeding centre upon referral from a health centre where children are screened for severe malnutrition, including kwashiorkor.

Phase 1: The aim of phase 1 is to treat major medical problems and initiate re-feeding. Proper medical treatment and therapeutic feeding is crucial during phase 1 to prevent death. Shock, septic shock and heart failure, conditions that require a physician's care, can occur. Misdiagnosis and treatment of dehydration is a common cause of death in cases of severe malnutrition. In severe malnutrition, renal dysfunction makes Standard Rehydration Solutions dangerous because of the risk of sodium overload and heart failure.

Step 1. Initiation of re-feeding.

- Eight feeds of F75 (therapeutic milk providing 75 kcal/100 ml) and care twenty-four hours per day. Breastfed children should be breastfed before they are fed F75[R];
- The total amount of F75 to feed is 100 kcal/kg of body weight/day (Table 9-16); No adjustment is made for cases of kwashiorkor;
- Nasogastric tubes should be used for anorexic children (children who do not have an appetite) who do not feed sufficiently by mouth (less than 75 kcal/kg/day); Nasogastric tubes should be inserted by trained medical staff;
- If no F75 is available, F100 diluted in 2.7 litres of water instead of 2 litres, which is the normal dilution, can be used.

[P] Exclusive breastfeeding should be reestablished for infants less than 6 months of age using supplemental suckling and dilute F100 (l package in 2.7 litres of water) as follows. Dilute F100 is put in a cup and the end of a nasogastric tube is put in the cup and the tip of the tube is put on the breast near the nipple. . . . When the baby suckles, she sucks the therapeutic milk. . . . The cup should be placed below the level of the breast so the milk does not flow too fast. . . . .

[Q] Percent of reference % WFH $= \dfrac{\text{weight}}{\text{median reference weight-for-height}} \times 100$
weight-for-height

[R] F75 and F100 are therapeutic milks that can procured through UNICEF. . . . One packet of F75 or of F100 is dissolved in 2 litres of water. . . . .

Table 9-16: Amounts of F75 to feed during phase 1 of therapeutic feeding[30]

Body weight (kg)	8 Feeds per 24 hr (ml per feed)	Body weight (kg)	8 Feeds per 24 hr (ml per feed)
3.0 -3.4	60	8.0 -8.9	140
3.5 -3.9	65	9.0 -9.9	155
4.0 -4.4	70	10 -10.9	170
4.5 -4.9	80	11.0 -11.9	190
5.0 -5.4	90	12.0 -12.9	205
5.5 -5.9	100	13.0 -13.9	230
6.0 -6.9	110	14.0 -14.9	250
7.0 -7.9	125		

Step 2. Administration of routine medicines to all children.

▪ Treatment of vitamin A deficiency if in a vitamin A-deficient area (Table 9-21);

▪ Treatment of malaria if in an endemic area-Treatment according to national protocol. All children should sleep under mosquito nets in malaria endemic areas;

▪ Antibiotics-The first line of treatment is amoxicillin (Table 9-17);

▪ Folate-5 mg on the first day;

▪ Oral iron supplements to treat severe anaemia should not be given in phase 1.

Table 9-17: Antibiotic treatment of severely malnourished children[30]

Weight (kg)	Amoxicillin dosage per day (mg)
2-6	62.5 * 3
6 -10	125 * 3
10 -30	250 * 3
>30	500 * 3

Step 3. Systematic recording of a child's signs, symptoms and weight:

▪ Weight is measured daily and plotted on a growth chart;

▪ Oedema is assessed daily;

▪ Body temperature is measured twice a day;

▪ Stool, vomiting, dehydration, cough and respiration are noted daily;

▪ Refusal to feed and use of nasogastric tube is noted daily.

Step 4. Treatment of **hypoglycaemia**

▪ The main signs of hypoglycaemia in the severely malnourished are low body temperature, lethargy, limpness and loss of consciousness;

▪ Patients who are conscious should be given F75 or 50 ml of 10% sugar water by mouth at least every three hours;

▪ Patients who are losing consciousness should be given 50 ml of 10% sugar water by nasogastric tube immediately. When consciousness is regained, they should be fed F75.

Step 5. Diagnosis and treatment of **hypothermia**

▪ Hypothermia is diagnosed when rectal temperature is <35.5°C or the underarm temperature is <35°C;

▪ Children should not be bathed when admitted;

▪ Children should wear a hat and be placed on the caregiver's bare chest and covered with clothes and blankets. Warm tea should be given to the caregiver;

▪ Children should sleep with their caregivers and not on the floor. Windows and doors should be closed at night.

Step 6. Diagnosis and treatment of **dehydration**

▪ Classic signs of dehydration should not be used because they mimic signs of marasmus (skinfolds, sunken eyes and dry mouth). Diagnosis of dehydration is, therefore, based on a definitive history of recent diarrhoea that was watery and frequent as well as on a recent change in the child's appearance according to the caregiver. Signs of severe dehydration (shock) are a weak or absent pulse, cool or cold extremities and loss of consciousness;

▪ **Resomal** is a solution that contains less sodium and more potassium than standard Standard Rehydration Solutions. It is formulated for the rehydration of dehydrated and severely malnourished individuals. Between 50ml and 100ml of Resomal per kg of body weight over twelve hours is usually enough to restore normal hydration, starting with 5 ml/kg every thirty minutes. Rehydration should be gauged by measuring the child's weight at intervals with the target weight gain being 5% of body weight. Care should be taken not to over hydrate the child. Clinical improvement should be noted after two hours. If it does not occur, the diagnosis of dehydration was wrong;

▪ Breastfeed and begin to give F75 as soon as possible;

▪ Children who have kwashiorkor are generally over hydrated and should not be treated for dehydration unless there is a definitive history of watery diarrhoea;

▪ Children with diarrhoea should be fed while being rehydrated. Even if diarrhoea is profuse, some nutrients are absorbed and feeding helps the child to recover.

Transition phase: The criteria to move from phase 1 to the transition phase are the return of appetite and the loss of oedema in cases of kwashiorkor.

▪ No child should be fed by nasogastric tube;

▪ Kwashiorkor cases should lose all their oedema before being moved from transition phase to phase 2;

▪ The only change in treatment is to give F100 instead of F75. The number of feeds, timing and amounts remain the same as in phase 1;

▪ F100 should never be given at the same time as Resomal. Rapid weight gain (>10 g/kg/day) is a sign of over hydration. if this occurs, the child should be returned to phase 1 and F75 for a few more days;

▪ Patients should remain in transition for about two days.

Phase 2: The aim of phase 2 is to allow the child to eat to appetite and regain weight rapidly.

▪ Breastfed children should receive breast milk before F100;

▪ Day care only;

▪ Six feeds should be given per day;

▪ The total amount of F100 to feed is 150-220 kcal/kg of body weight/day;

▪ Children should be encouraged to eat but not force-fed;

▪ Iron supplementation, de-worming medicine and measles vaccination should be given;

▪ Porridge can be fed after F100. Feeding porridge may slow recovery.

Table 9-18: Amounts of F100 to feed during phase 2 of therapeutic feeding[30]

Body weight (kg)	6 Feeds per 24 hr (ml per feed)	Body weight (kg)	6 Feeds per 24 hr (ml per feed)
3.0-3.4	110	8.0-8.9	270
3.5 -3.9	120	9.0 -9.9	300
4.0 -4.0	150	10 -11.9	350
5.0 -5.9	180	12.0 -14.9	450
6.0 -6.9	210	15.0 -19.9	550
7.0 -7.9	240		

Discharge: At least 80% of median weight-for-height international reference standards and no oedema are the criteria used for discharge from therapeutic feeding and admission to supplementary feeding where available. Discharge should be at 85 % weight-for-height if there is no supplementary feeding programme.

Community therapeutic care

Community therapeutic care is appropriate for uncomplicated cases of severe malnutrition (children who have good appetites and have no oedema, do not require a nasogastric tube for feeding) on an outpatient basis. It costs less than the care at a therapeutic feeding centre and results in similar mortality and recovery rates. The great advantage of community therapeutic care is that it reaches many more children than therapeutic feeding centres, but there must always be a referral centre for complicated cases.

Community therapeutic care programmes use a ready-to-use therapeutic food, Plumpy Nut, which is made from vegetable fat, peanut butter, dried skim milk, sugar and fortified with vitamins and minerals. Plumpy Nut can be obtained through UNICEF. Two to three packets of Plumpy Nut per day per child are provided in a day care centre under supervision or to take home. In day care programmes, routine medicines are administered and children are weighed each day. Take-home programmes provide routine medicines and Plumpy Nut (fourteen packets) and a blended supplementary food (3kg to 4kg) per week as a take-home ration, with home visits once or twice a week by outreach workers.

*Community therapeutic feeding programme: supervision of children eating Plumpy Nut
(Photo: J Pierre-Louis, UNHCR, 2004)*

Routine medicines are similar to those used in therapeutic feeding centres and include the following:

- Resomal for cases of dehydration[S];
- Albendazole or mebendazole;
- Vitamin A supplementation;
- Folic acid;
- Co-trimoxazole (five-day course).

Mosquito nets as needed are distributed for use at home.

Caregivers should be guided on the appropriate use of Plumpy Nut and preparation of porridge using blended supplementary food as follows.

- Plumpy Nut is a special food like medicine and is not to be shared with siblings;
- Children should be fed as much Plumpy Nut and porridge as they can eat every three hours.

Parents should be instructed as follows:

- Children should be kept warm;
- Encourage but do not force feed children;
- Wash hands and cover food and water;
- Rapidly refer children who become ill to the health centre.

Therapeutic feeding supplies

Where information about the prevalence of acute malnutrition is lacking in a nutrition emergency, planning figures of 2% severe malnutrition among children under five may be used to estimate therapeutic food requirements.

For example:	
Estimated size of the emergency affected population	30,000
Estimated number of children aged less than five years (15-20%)	4,500-6,000
Estimated number of severely malnourished children (2%)	90-120

F75, F100, Resomal and Plumpy Nut can be procured through UNICEF.

- F75. Twenty sachets of 410 g cover the requirements of twelve children in phase 1 (three days);
- F100. Twenty sachets of 456 g cover the requirements for one child in phase 2 (thirty days);
- Resomal. Two sachets of 8.4 g cover the requirements for one child;
- Plumpy Nut. Ninety sachets (two to three sachets of 92 g per child per day) cover the requirements for one child (forty-five days).

If F100 is unavailable, high-energy milk may be prepared from Vitamin A fortified Dried Skim Milk (DSM), sugar and oil as follows:

- DSM   220g;
- Sugar   120g;
- Oil   60g;
- Water   1.7 litres.

[S] This is different from the classical therapeutic feeding protocol wherein children who have good appetites do not receive Resomal. . . . Resomal is given as a precaution against sodium overload. . . .

One scoop (6.35 g) of **therapeutic vitamins and minerals** (ThCMV) should be added to the above.

Other supplies needed for therapeutic and supplementary feeding are listed in Table 9-19. Kits with non-food and nonmedical items needed for a feeding programme are available through UNICEF, Médecins sans Frontières and Oxfam. Some materials can be purchased locally. All health facilities including therapeutic feeding centres need water, latrines or toilets, beds or mats, cooking fuel and food for caregivers. A therapeutic feeding centre should be clean, be enclosed to protect children against the cold and have adequate space. Beds are not necessary when children and mothers are accustomed to sleeping on mats.

Table 9-19: Supplies for emergency nutrition interventions[30]

Screening for acute malnutrition	▪ Salter scales, weighing pants, Mid-Upper-Arm Circumference measuring tapes, height boards, weight-for-height reference tables, registration books, health cards ▪ Stationery: clipboards, notebooks, pens, pencils, erasers, pencil sharpeners, rulers, calculators, scissors ▪ * Instructions and guidelines
Therapeutic and supplementary feeding centres	▪ Cooking pots, large spoons, cups, bowls, teaspoons, measuring jugs, measuring spoons/scoops, ladles, can openers ▪ Salter scales, weighing pants, clocks ▪ Large bowls, plastic water containers, plastic buckets, flashlights and batteries, plastic potties ▪ Blankets, lamps, flashlights ▪ Nasogastric tubes (CH#8, 10), syringes (60 ml, 200 ml) ▪ Water filter, water-purifying tablets ▪ Cleaning materials, soap ▪ * Patient charts, registration book, markers
Therapeutic feeding centre essential medical supplies (partial list)	▪ Routine medicines (phases 1 and 2) ▪ Fever reducer ▪ Topical ointments: zinc oxide, tetracycline eye ointment ▪ First aid: bandages, soap, scissors, iodine ▪ Nasogastric tubes ▪ * Thermometers

Vitamin A supplementation

Vitamin A deficiency is a major contributing factor to mortality in emergencies. High-dose vitamin A supplementation can reduce the duration of the disease, its severity, complications and prevent nutritional blindness or xerophthalmia (Table 9-20). Vitamin A supplementation can be provided with immunisations as appropriate e.g. measles in the affected population. Vitamin A supplementation coverage of the population should be at least 70%.

Table 9-20: Supplementation protocol to reduce and prevent vitamin A deficiency[44]

Age group	Every 4- 6 months
6 -11 months	100,000 international units
12-59 months	200,000 international units

High-dose vitamin A supplements should also be given to all cases of:

- Xerophthalmia and children living in the same household or community as a child who has xerophthalmia;
- Measles;
- Severe acute malnutrition, kwashiorkor and marasmus (Table 9-21).

Table 9-21: Vitamin A supplementation: xerophthalmia, measles and severe acute malnutrition[44]

	Age in months	Immediately	Next day	2 weeks later
Severe malnutrition	0-5	50,000 IU	50,000 IU	
	6-11	100,000 IU	100,000 IU	
	>12	200,000 IU	200,000 IU	
Xerophthalmia	0-5	50,000 IU	50,000 IU	50,000 IU
	6-11	100,000 IU	100,000 IU	100,000 IU
	>12	200,000 IU	200,000 IU	200,000 IU
Measles	0-5	50,000 IU	50,000 IU	
	6-11	100,000 IU	100,000 IU	
	>12	200,000 IU	200,000 IU	

The signs and stages of xerophthalmia are as follows:

- Night blindness-Difficulty seeing in the dark;
- Xerosis-The white of the eye loses its shine and begins to wrinkle;
- Bitot Spots-Patches of grey bubbles on the white of the eye;
- Corneal ulceration-Damage to the cornea;
- Keratomalacia-Soft or bulging cornea.

Corneal ulceration is a medical emergency requiring immediate treatment to prevent the loss of vision in the affected eye. Keratomalacia is the last clinical stage of xerophthalmia where the eyesight in the affected eye has been lost.

Maternal night blindness due to vitamin A deficiency is common in the latter half of pregnancy in some populations. It affects an estimated 10% to 20% of pregnant women in south and southeast Asia. Symptoms of night blindness are blurred or hazy vision at dusk and a history of inability or difficulty working or engaging in activities at night. WHO recommends treating maternal night blindness with daily oral doses of 10,000 International Units (IU) of vitamin A for four to eight weeks. High doses of vitamin A such as those used to supplement preschool-aged children can cause birth defects and should not be given to women of reproductive age except postpartum within six to eight weeks of delivery (200,000 IU).

> In 2004, a measles immunisation and vitamin A supplementation campaign combined with polio immunisation was undertaken by the international community and the ministry of health in Darfur, reaching more than two million children.

Treatment of severe anaemia

Iron is essential to synthesise haemoglobin, which is a protein in the blood that transports oxygen. Anaemia is defined by low haemoglobin concentration which decreases the amount of oxygen transported to the cells of the body. Severe anaemia is a haemoglobin concentration of <7 g/dl or haematocrit of <20%, leading to cardiac decomposition to the

point that the heart cannot maintain adequate blood circulation. Where laboratory tests are impractical, severe anaemia might be diagnosed by using extreme abnormal pallor of the inner eyelid, the nail beds or palms of the hands.

Any child who has kwashiorkor or marasmus should be assumed to be severely anaemic and be treated for severe anaemia in phase 2 when the child regains his appetite and is gaining weight. The protocol for treatment of severe anaemia is given in Table 9-22.

Table 9-22: Protocol for treatment of severe anaemia[24]

Age group	Daily dose	Duration
<2 years	25 mg of iron + 100-400 ug of folate	3 months
2 -12 years	60 mg of iron + 400 ug of folate	3 months
Adolescents and adults, including pregnant women	120 mg of iron + 100-400 ug of folate	3 months

Monitoring and evaluating the adequacy of the emergency response

Monitoring involves both the relief response (the process) and the nutritional status of the target population (outcomes). Management of the food pipeline and food aid distribution, the performance of therapeutic and supplementary feeding programmes and vitamin A coverage should be monitored to determine whether these interventions are adequate. In addition, programmes should be periodically planned and reviewed using the internationally agreed Sphere Project food and nutrition standards. Using the findings to improve decision making and coordination e.g. changing strategies in response to changes in needs or the disaster context strengthens implementation and improves the adequacy of the emergency response as well as accountability.

Management of the food pipeline and distribution

The following checklist can be periodically used by managers to monitor management of the food pipeline.

Table 9-23: Checklist for monitoring the food pipeline

Activity	√	Remarks
Purchase contracts provide for delivery-linked payments, the return of damaged goods and penalties for any deviations in fulfilment of the contract.		
Transporters and handling agents assume total liability for food commodities in their care and reimburse any losses.		
Storage facilities are safe and clean and protect food commodities from damage and/or loss.		
Steps are taken at all levels to minimise commodity losses.		
All losses are identified and accounted for.		
Commodities in damaged containers are salvaged as far as possible.		
Commodities are inspected at regular intervals and any suspect commodities are tested.		

Unfit items are certified and disposed of in accordance with defined procedures and national public health regulations.		
Physical inventory counts (receipts, issues and stock balances) are undertaken periodically e.g. every fourteen days and are reconciled.		
Summary inventory including pledges and expected arrivals are compiled at regular intervals and made available to all stakeholders.		
Activity	**√**	**Remarks**
Waybills document all commodity transactions.		
Stock ledgers provide details of all receipts, issues and balances.		
Auditing is carried out at all levels of the supply chain. Accounting and reporting happens all along the supply chain from origin through delivery to distribution sites.		
Vehicles carrying food commodities must be in good running order, cargo spaces have no protruding edges that can damage packaging and are protected from bad weather (e.g. by tarpaulin).		
Vehicles that carry food commodities do not carry other commercial and/or hazardous materials.		
Vehicles should not have carried hazardous commodities in the recent past. There should also be no residues.		
Distribution and acceptability of the ration received to beneficiaries are confirmed through records and random interviews during visits to target households.		
Distribution reporting includes number of actual beneficiaries for the particular distribution period, the opening balance of food stocks, the quantity of commodities distributed, losses, damages and closing balance.		

Performance of feeding programmes

The following example shows how to calculate for a therapeutic feeding centre the default rate, death rate and recovery rate for a given time period, e.g. one month. The same rates are calculated to monitor the performance of a supplementary feeding centre.

Table 9-24: Sample supplementary feeding centre data

Caseload at beginning of period	New admissions (weight-for-height<70%)	New admissions (bilateral oedema)	Relapsed cases	Defaulted Cases	Deaths	Recovered cases	Caseload at end of period
97	37	5	1	23	6	48	63

- ▪ Default rate = 23/(23+6+48) = 29%;
- ▪ Mortality rate = 6/(23+6+48) = 8%;
- ▪ Recovery rate = 38/(23+6+48) = 49%.

The recovery rate for therapeutic feeding should be greater than 75%; the death rate should be less than 10% and the default rate should be less than 15%. Default rates are influenced by accessibility (distance, security) and the quality of care provided[T]. The above example is one of a therapeutic feeding centre whose performance needs strengthening. While the death rate is acceptable, the recovery rate is too low and the

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[T] This threshold for mortality is not adjusted for a high proportion of cases that are HIV-positive; the extent to which mortality rates are affected by HIV is unknown. . . . Mortality rates should be interpreted in light of the severity of the malnutrition being treated. . . .

default rate is too high. These statistics are analysed over time for trends e.g. for increasing caseloads, which signal the need to expand therapeutic feeding. The statistics are compiled monthly and compared to those of other therapeutic feeding centres and affected areas at regional and national levels.

Nutrition monitoring and nutrition surveillance

Once a food and/or nutrition emergency response has been triggered, nutrition surveillance is used for monitoring acute malnutrition rates over time in different areas and in different socioeconomic groups. The same benchmarks used to trigger an emergency response are eventually used to recommend the scaling down of food and nutrition emergency interventions.

Table 9-25: Nutrition surveillance benchmarks

Nutrition situation	Recommended actions
Acute malnutrition rate >15% OR 10%-14% with aggravating factors*	Emergency food aid: general food ration Blanket supplementary feeding Therapeutic feeding of severely malnourished individuals
Acute malnutrition rate 10-14% OR 5%-9% with aggravating factors*	No general rations Targeted supplementary feeding Therapeutic feeding of severely malnourished
Acute malnutrition rate < 10% with no aggravating factors	No emergency food and nutrition intervention

Aggravating factors include the following:

- Household food insecurity;
- High prevalence of HIV/AIDS;
- Crude mortality rate greater than 1/10,000/day;
- Under-five crude mortality rate greater than 2/10,000/day;
- Epidemic of measles or whooping cough (pertussis);
- High prevalence of respiratory or diarrhoeal diseases;
- High prevalence of pre-existing malnutrition, e.g., underweight and/or stunting.

Any cases of scurvy, pellagra or beriberi that occur during the emergency response phase should be reported. Monitoring of aggravating factors is also part of nutrition monitoring.

Data should be analysed and interpreted locally and appropriately compiled and analysed at the regional and national levels.

Sphere project standards

Programmes should be planned and evaluated using the internationally agreed Sphere Project standards for food aid, nutrition and food security (see next section). The Sphere Project, launched by the International Federation and humanitarian NGOs, has developed standards for humanitarian relief to promote accountability by relief agencies in emergency situations. The standards, which are qualitative, specify minimum levels for the emergency response and are used for planning, monitoring and evaluating the adequacy of the emergency response.

Food aid standards

1. General food rations are based on nutrition requirements. Rations should make up the difference between average nutrition requirements and what people can provide for themselves;
2. Rations reduce or eliminate the need for coping strategies;
3. The economic transfer value of the ration is calculated where rations might be traded;
4. The target population is consulted on the cultural acceptability of food items;
5. If an unfamiliar food is distributed, instructions on its preparation are provided;
6. Access to fuel and water are considered when selecting commodities;
7. Beneficiaries have access to milling facilities when whole grain cereals (e.g., maize) are distributed;
8. Beneficiaries have access to condiments and other culturally important food items;
9. Milk is not distributed;
10. Food commodities conform to national and international standards;
11. All imported packaged food has a shelf life of six months and is distributed before the expiration date;
12. There are no verifiable complaints about the quality of food;
13. Food packaging is sturdy;
14. Packaged foods are labelled in an appropriate language with the date of production, expiration date and nutrient content;
15. Storage conditions are dry, clean, protected from weather, uncontaminated and secure from pests;
16. There are no adverse health effects resulting from food handling or preparation at any distribution site;
17. Beneficiaries are informed about food hygiene;
18. There are no complaints about storing, preparing, cooking or consuming the food distributed;
19. All households have access to cooking utensils, fuel, cooking water and soap;
20. Individuals who cannot prepare food or cannot feed themselves have access to a caregiver;
21. Food aid reaches the targeted beneficiaries;
22. Supply chain management is assessed and an efficient system is established, using local capacity where feasible;
23. The above assessment considers the availability of local food commodities;
24. The award of contracts is transparent and fair;
25. Staff at all levels is adequately trained and observes food safety and quality procedures;
26. Inventory, reporting and financial systems are in place to ensure accountability at all levels;
27. Care is taken to minimise losses, including theft; all losses are accounted for;
28. The food pipeline is monitored to avoid interruption in distribution;
29. Information on food supplies and operations is provided to stakeholders and beneficiaries on a regular basis;
30. Beneficiaries are identified and targeted on the basis of need through consultation with stakeholders and the community;
31. Efficient and equitable distribution is designed in consultation with local groups and organisations and the community;
32. The point of distribution is as close as possible to beneficiaries' homes to ensure access and safety;

33. Beneficiaries are informed in advance of the quality and quantity of the food ration and the distribution plan;

34. The performance and adequacy of the food aid programme are monitored and evaluated.

Nutrition standards

1. Emergency affected populations have access to a staple, pulses or animal food sources and fat food sources that meet nutritional requirements; vitamin A-rich, vitamin C-rich and iron-rich or fortified foods; iodised salt; niacin-rich foods (e.g. pulses, nuts, dried fish) if the staple is maize or sorghum; thiamine-rich foods (e.g. pulses, nuts, eggs) if the staple is polished rice; and riboflavin-rich foods when the diet is limited;

2. Levels of moderate and severe malnutrition are stable at or declining to pre-emergency levels;

3. There are no cases of scurvy, pellagra, beriberi or riboflavin deficiency;

4. Vitamin A deficiency and iodine deficiency are controlled by high-dose supplementation in target populations, salt iodisation and public awareness;

5. Infants under six months are exclusively breastfed;

6. Children six to twenty-four months are breastfed and have access to adequate complementary foods;

7. Pregnant and breastfeeding women have access to supplementary food when the general food ration is inadequate; nutritional support should be provided to adolescent girls when feasible;

8. Health professionals, caregivers and relevant organisations are provided information and training about infant and young child feeding practices;

9. Older people have access to food and nutritional support;

10. Persons living with HIV/AIDS and the chronically ill and disabled have access to food and nutritional support;

11. Community-based systems are in place to care for vulnerable individuals;

12. Objectives and criteria for closure of supplementary and therapeutic feeding programmes are set;

13. Supplementary feeding programmes are short-term and implemented only when the general food ration is adequate and nutrition surveys have been conducted;

14. Coverage of supplementary and therapeutic feeding programmes is >50% in rural areas, >70% in urban areas and >90% in camps;

15. More than 90% of the target population is within a one-day walk of the distribution site for supplementary food;

16. The proportion of exits from supplementary feeding who recover is >75%, who default is <15% and who die is <3%; the proportion of exits from therapeutic feeding who recover is >75%, who default is <15% and who die is <10%. Children who exit therapeutic feeding are referred to supplementary feeding programmes;

17. Admission to supplementary feeding is based on international reference standards for weight-for-height;

18. Targeted supplementary feeding is linked to health facilities and protocols are followed to identify health problems and for referral;

19. Supplementary feeding is dry take-home unless there is a rationale for on-site feeding;

20. Discharge criteria from therapeutic feeding include good appetite and absence of illness and untreated infections;

21. Mean weight gain is >8 g/kg of body weight/day; nutritional and medical care is provided according to international protocols;

22. Attention is paid to breastfeeding, psychosocial support, hygiene and community outreach;

23. Constraints on caring for malnourished individuals and family members should be addressed;

24. All clinical cases of micronutrient deficiencies are treated according to WHO supplementation protocols;

25. Micronutrient deficiencies are prevented in populations at risk;

26. Health staff is trained how to identify and treat micronutrient deficiencies for which populations are at risk.

Recovery and household food security

Food security and nutrition policies

Direct food aid should be short term. Long-term relief aid is not only creating dependency and expensive, but it might also have a negative impact on local agricultural production and economic development as well as increase population displacement. Prolonged food aid is also inappropriate and ineffective for promoting the recovery of the emergency affected population. The priority should shift from direct food aid to development programmes as soon as possible to improve long-term household food security.

The speed of recovery from an emergency depends on the health status of the target population, the capacity to produce food and/or engage in other income-generating activities, the security situation and public policies. Crises are aggravated by underlying causes of malnutrition: chronic food insecurity, chronic disease (HIV/AIDS) and chronic malnutrition. Food-insecure, marginal populations faced with drought, floods or economic shocks are much more vulnerable to food and nutrition emergencies. Food security and nutrition policies can reduce these vulnerabilities. Therefore, once the immediate food and nutritional needs of the target population have been addressed, all emergency efforts should include plans for protecting and re-establishing the food security and livelihoods of the affected population through agricultural, economic and health and nutrition policies to reduce poverty and vulnerability to famine. Food and nutrition emergencies often focus the attention of national and local policymakers on food security and nutrition.

> Since 2003, an outreach programme strategy has been providing millions of Ethiopian children in drought-prone areas a package of health and nutrition services at regular intervals, including vitamin A supplementation, de-worming medicine, measles vaccinations, screening for acute malnutrition and referral to supplementary and therapeutic feeding programmes.

Household food security interventions

As populations recover from a food and nutrition emergency, assistance to food-insecure households and areas should be provided. Household food security interventions address primary production factors: inputs such as seeds, tools, fertiliser, livestock, fishing and hunting equipment, loans and credit; market information; transport facilities; training; and access to markets, natural resources and extension services.

Table 9-26: Sphere project standards and indicators for food security

Standard/intervention	Indicators
Protection and support of primary production	Interventions are based on an understanding of the viability of production systems including access and availability of inputs and services.
	New technologies are introduced only when implications for local production systems are understood and accepted by food producers;
	A range of inputs is provided to producers for flexibility in managing production, processing and distribution;
	Production inputs conform to quality norms;
	The introduction of inputs and services does not exacerbate vulnerability or increase risk by increasing competition for natural resources or damaging social networks;
	Inputs and services are purchased locally unless this adversely affects local producers, markets or consumers.
Access to income-generating opportunities and fair remuneration	Project decisions are made based on an understanding of local human resource capacity, market and economic analysis and demand and supply for skills and training;
	Jobs and income opportunities are technically feasible and inputs are available on time;
	Remuneration is appropriate and payments are timely;
	The work environment is safe and secure;
	Labour opportunities protect household caring responsibilities and do not negatively affect the environment or interfere with other livelihood activities.
Access to markets and services by producers and consumers	Activities are based on an understanding of local markets and economic systems and lead to system improvement and policy change when necessary;
	Producers and consumers have access to markets, supply of basic items and food at affordable prices;
	There is information about market prices and markets and the policies that govern them;
	Extreme seasonal and other price fluctuations are minimised.

Essential nutrition actions

National health authorities and NGOs play an important role in providing nutrition services in health centres and in the community to prevent and treat malnutrition among children under five, women of childbearing age and other target groups such as persons living with HIV/AIDS during emergencies and non-emergencies alike. Therapeutic and supplementary feeding programmes should be integrated into community health programmes that offer health and nutrition services such as immunisations, nutrition and health education and growth monitoring.

Key nutrition outcomes that promote growth and prevent illness and death in a wide range of countries and contexts are as follows:

- Exclusive breastfeeding for at least four months and up to six months;
- Appropriate complementary feeding and continued breastfeeding for two years;
- Adequate nutritional care during illness and severe malnutrition;

- Adequate vitamin A intake;
- Adequate iron intake;
- Adequate iodine intake.

Activities that national governments and NGOs can implement in support of these outcomes are summarised in Table 9-27. Outreach strategies such as Child Health Week to increase access to vitamin A supplementation and other preventive services for preschool-aged children can serve as a safety net for children at risk.

Table 9-27: Activities to support key nutrition outcomes[43]

Outcome	Activities
Exclusive breastfeeding	Support the Breastfeeding Friendly Hospital Initiative and the International Code for Marketing of Breast milk Substitutes; Train health staff in breastfeeding counselling (WHO/UNICEF); Reach out to all women during pregnancy, at delivery and postpartum through women's groups, breastfeeding support groups and traditional birth attendants; Increase community awareness of exclusive breastfeeding in the community through communication activities; Include the lactational Amenorrhea method in all family planning activities.
Feeding children 6-24 months old	Identify problem areas that affect the growth and feeding of children six to twenty-four months. Use local feeding recommendations; Support community health workers to assess and counsel on feeding practices; Train and supervise health workers to train and support caregivers and community groups on feeding well children, sick children and convalescing children as well as breastfeeding. Refer families who need social support, including HIV-positive mothers; Increase community awareness of appropriate infant and young child feeding practices in the community through communication activities.
Sick and malnourished children	Support breastfeeding of all sick children up to twenty-four months of age; Support feeding during illness and increase variety, frequency and amounts after illness; Use health protocols (Integrated Management of Childhood Illness) for assessment and treatment at health facilities; Identity local perceptions and caring practices for sick and malnourished children and use this information in counselling; Establish at least one high-quality unit for treating severely malnourished children to serve as a referral facility for the administrative area.
Vitamin A intake	At all health contacts, encourage the daily intake of vitamin A-rich foods by young children and women; Encourage breastfeeding; At all sick-child contacts give high-dose vitamin A supplements to children with measles, severe malnutrition, prolonged diarrhoea and other infections; Train health staff to detect and treat clinical vitamin A deficiency with high-dose vitamin A; Implement preventive supplementation for children six to fifty-nine months every four to six months in areas where deficiency is known to be a public health problem.

Outcome	Activities
Iron intake	Train health workers and community health workers to detect severe anaemia and to give iron supplements to young children and pregnant women presenting with severe anaemia;
	Ensure supply of iron supplements;
	Promote the consumption of iron-rich food, vitamin C-rich foods and iron-fortified foods (except formula, which tends to replace breast milk) by women of reproductive age, infants and young children;
	Strengthen preventive measures such as malaria bed nets and de-worming.
Iodine intake	Ensure that only iodised salt is sold in the community by increasing awareness among salt suppliers, consumers and local authorities;
	Teach community health workers how to test salt for iodisation.

Nutrition support for persons living with HIV/AIDS

HIV infection increases energy requirements and decreases food intake and weight loss and wasting in children and adults and growth failure in children are common. Malnutrition depresses the immune response of HIV-positive individuals including CD4 T-cell counts, delayed hypersensitivity and B-lymphocyte immune responses. Diet counselling can improve compliance with antiretroviral drugs and other medicine to treat HIV-related infections and can help individuals maintain their food intake.

Good nutrition is important for persons living with HIV/AIDS because:[49]

- Good nutrition helps keep the immune system strong;
- A healthy diet improves quality of life;
- Malnutrition can contribute to disease progression;
- Good nutrition helps the body process medications taken by people with HIV;
- Diet may help with symptoms such as diarrhoea, nausea and loss of appetite.

Persons living with HIV/AIDS should eat a regular diet consisting of staples, legumes, animal food sources, fat and oil and fruits and vegetables. HIV-infected asymptomatic persons need 10% more energy and HIV-infected symptomatic persons need 20% to 30% more energy. Body weight, measured by a Body Mass Index of at least 18.5, should be maintained.

Because persons living with HIV/AIDS are more vulnerable to infection, proper food and water handling is especially important to avoid infections caused by contaminated food and water.

Table 9-28: Guidelines for food handling and water and hygiene

Water	Be sure water is clean. Keep boiled water stored in a clean container with a lid. Do not dip hands or cups into the container; instead pour water from the container. Use a tap if possible. Always wash hands with soap before and after handling foods and using the toilet/latrine.
Animal food sources	Cook all animal food products thoroughly. Do not eat raw eggs. Thoroughly wash hands and surfaces that have touched uncooked meat before handling other foods. Cover foods. Keep foods separate from other foods.
Fruits and vegetables	Use clean water to wash all fruits and vegetables to be eaten raw. Remove the skin if possible. Remove any bruised parts. Boil vegetable thoroughly but do not overcook which will cause vitamin loss.
Hygiene	All food preparation and eating area should be free of flies and other insects. Use clean dishes and utensils. Keep hot food hot before eating. Avoid storing leftovers unless they can be refrigerated. Always re-heat at a high temperature. Avoid eating street food and foods purchased from vendors in the marketplace. Washing clothes, bedding and surfaces that might have been contaminated by faeces with hot water and soap.

Table 9-29: Selected care practices for symptoms associated with HIV[48]

Symptom	Care practices
Diarrhoea	Drink plenty of fluids. Avoid citrus juices that might irritate the stomach. Consume foods rich in soluble fibre (millet, banana, peas and lentils) that help retain fluids. Boil or steam foods. Eat fermented foods such as porridge and yogurt. Eat small amounts of food frequently. Eat soft fruits and vegetables. Avoid milk, caffeine and fatty foods.
Nausea	Eat small and frequent meals. Eat lightly salted and dry foods such as crackers. Drink fluids. Rest between meals but do not lie down immediately; wait at least twenty minutes. Avoid spicy and fatty foods, caffeine and alcohol. Avoid having an empty stomach.
Weight loss	Increase food intake by increasing portion size and meal and snack frequency. Increase intake of animal food sources.
Loss of appetite	Eat favourite foods. Eat small amounts of food frequently. Select energy dense foods. Avoid foods with strong smells.

Food security of HIV/AIDS-affected households

Food aid can help mitigate the impact of HIV/AIDS on household food insecurity and improve the dietary intakes of persons living with HIV/AIDS by providing them with nutrition education. Food assistance is increasingly being provided to those widowed or orphaned by AIDS and all vulnerable children. USAID has Title II programmes in Africa and Haiti to assist households affected by HIV/AIDS.

Interventions to mitigate the effects of HIV/AIDS on food security include the following:

- Introduction of less labour-intensive food production, food processing and food preparation methods;

- Microcredit to help households manage their cash needs to buy food, medicine and agricultural supplies and to protect assets and safeguard livelihoods;

- Vocational training to expand income-generating and employment options for individuals affected by HIV/AIDS, particularly orphans;

- Agricultural extension to help increase food production, especially for women;

- Training of agricultural extension agents to increase awareness of HIV/AIDS and its socioeconomic impact on households and the community;

- Community support for reducing social stigma around households affected by HIV/AIDS.

In 2006 the World Food Programme in northern Ethiopia (Amhara) started distributing, food aid to households affected by HIV/AIDS and to orphaned and vulnerable children.

HIV/AIDS is largely an urban problem in Ethiopia that results in the impoverishment of many households. In 2002 in one neighbourhood in Addis Ababa, a community vegetable garden was created by a women's community group with the support of local government and local technicians, providing much-needed income for food-insecure households.

Table 9-30: Food security interventions for HIV/AIDS: affected households[2]

Intervention	Activities
Less labour	Livelihood strategies that are less labour-intensive; Shared care giving of persons living with AIDS; Agricultural practices that reduce labour requirements; Food processing technologies that reduce labour requirements.
More cash	Cultivation of crops requiring less inputs; Gathering of wild foods; Provision of grants for animal purchase or rental; Provision of micro-finance for operating expenses; Improvements in food storage and preservation; Support for local market development; Pay cash-for-work vs. food-for-work.
Asset protection	Provision of grants for assets, e.g., small animal husbandry; Replanting of community forests; Investment in community-owned assets e.g. ploughs, draught animals; Provision of grants for asset protection.
Increased knowledge and skills	Dissemination of new labour-saving agricultural technologies and practices; Increased awareness of HIV/AIDS prevention and care; Support for communities to share practical experience with HIV/AIDS affected households; Creation of incentives for school attendance; Provision of business and management training for HIV/AIDS affected households and community groups.
Local institution building	Support for communal food and cash crop production; Support for the protection of community assets and infrastructure; Improvements in community health, e.g. sanitation, to reduce morbidity; Provision of legal aid to HIV/AIDS affected households.

Treguine Refugee Camp, Chad / Daniel Cima/International Federation

Management

Description

This chapter provides practical guidance for planning and the implementation of humanitarian interventions for emergency and post-conflict situations at short notice.

Learning objectives

- To characterise common management issues surrounding humanitarian assistance in emergency settings;
- To review different management approaches and their application in short and long-term programme planning;
- To discuss how to carry out a rapid needs assessment, and set goals and objectives through a logical framework based on the identified priority needs;
- To develop a logical framework and operational plans and budgets based on available resources;
- To review key steps in proposal development;
- To discuss how to implement an emergency response operation based on set plans and guidelines;
- To describe the implementation process in terms of coordination, leadership, and management of human resources and organisational challenges;
- To discuss how to establish effective relations between humanitarian organisations, the International Federation of Red Cross and Red Crescent Societies, UN and the government sector;
- To define the steps for monitoring and evaluating relief projects.

Key competencies

- To understand the main management issues that interfere with the success of a relief operation;
- To apply a conflict sensitive approach to the planning cycle in managing a relief operation;
- To organise a rapid assessment and write SMART objectives based on assessment findings;
- To design a simple relief programme with consideration of existing resources;
- To recognise the importance of coordination and good leadership in management of resources and constraints;
- To set up an information system and organise a final evaluation.

Introduction

> **'If you don't know where you're going, any road will get you there.'**
>
> **'If you don't know where you are, you may already be there. Or you may not be.'**

Management is sometimes presented as a complicated process, but it simply means seeing the bigger picture and finding the best way to use resources in order to achieve set objectives. In other words, managing is about ensuring that the processes, procedures,

personnel and resources are used in an efficient and effective way. Good management helps an organisation to set appropriate, realistic objectives achieve its goal.

In emergency and post-conflict situations, managing a project involves the following:

- Assessing—developing the best possible understanding of the evolving needs, threats and capacity for response;
- Planning—analysing different ways of moving toward identified goals in the order of priorities;
- Implementation—transforming inputs through a set of systems and procedures to produce outputs;
- Monitoring and evaluation—continuously and periodically assessing work against the targets using realistic and measurable impact indicators.

On the other hand, the successful implementation of humanitarian projects also requires:

- Leadership—people with the correct experience and knowledge to be responsible for accomplishing the organisation's goal by making the best use of available resources (staff, money, material etc.), within the given constraints and challenges;
- Coordination—a harmonious and effective working together of people and organisations toward a common goal.

Bam earthquake hit Iran's south-eastern province of Kerman on 26 December 2003, killing an estimated 30,000 people and leaving hundreds of thousands homeless. Photo: Farooq Burney/ International Federation

Management issues in emergencies

The success of relief operations can be affected by many management issues. Common issues are:

- **Limited organisational capacity** —Because of the increased resources for humanitarian assistance, thousands of new Non-Governmental Organisations (NGOs) have emerged over the past decade. Unfortunately, many lack the experience or technical know-how to undertake an effective emergency response. Their *ad hoc* interventions might cause more harm than good. Poorly done humanitarian interventions also have 'opportunity costs' by taking away resources from other vital activities. Thus, organisations with the capacity and a competent workforce are vital to assure the improvement of health outcomes in a cost-effective way;

- **Poor coordination between health and other authorities, and poor understanding of how to contribute towards longer-term national development plans**—Since the First World War, numerous natural or human-made disasters have occurred globally demanding for large scale humanitarian relief and development response. Many humanitarian organisations including UN and the International Federation rush to fill the administrative and operational vacuum caused by an overwhelmed or weak government capacity. The humanitarian imperative i.e. the urgency to prevent widespread suffering prompts many donors and governments to welcome the international and local humanitarian organisations' rapid response to fill the need gaps caused by a disaster. During this period, government might need substantial assistance and support to coordinate efforts and structures such as the Inter Agency Standing Committee cluster system which is created to fill that role. Government is

the overall coordinator and must be respected as such. In some situations, the government might name an organisation or cluster to temporarily be in overall charge. However, within a short period and as the situation stabilises, local authorities often prefer to assume their role and take credit for the services delivered and the infrastructure developed. Tensions can arise if NGOs ignore the host government's wishes in an effort to minimise bureaucratic delays. Similarly, the government complains to donors about the lack of NGO transparency and high overhead costs. It is important that NGOs work within the existing legal framework and coordinate all activities about planning, implementation and evaluation through the host health and other authorities. Local authorities can help address external factors surrounding the emergency response such as insecurity, the political context etc. Coordination within the framework of longer-term national development plans and existing health sector programmes will reveal a common goal and better strategies for meeting priority needs of displaced populations while allowing each agency to focus on what it does best. As humanitarian assistance needs diminish, NGOs can redeploy skilled staff to concentrate on appropriate recovery and developmental work in line with the government plans and priorities;

▪ **Inadequate evidence-based planning**—Planning a relief programme is hard work because it needs to be based on the best available information. This is often a huge challenge in the early stages, where information and data is incomplete, erratic and often changes by the minute. Substantial experience from other similar situations is required. Good analytical skills are imperative to get the priorities right and, above all, tough operational decisions must be made on sketchy information. In sudden impact disasters, lives have to be saved during the first three to four days and prompt action is required without delay. Rapid assessments such as fly-overs or just travelling through the area is essential to get an idea about the magnitude of the impact, where the needs and priorities are. More thorough assessments are the next step and plans can be made on firmer data. In slow onset disasters, this time frame is different and more complete assessments can be started.

There are some challenges to keep in mind. Firstly, the existing health information systems in most developing countries are often weak and the data can be quite inaccurate, especially on the local level. If the system is weak before the disaster, it will function even less effectively during and after a disaster. One might have to create a separate database, however, based on Sphere standards and much in line with what the government already has. Secondly, many humanitarian organisations are often unwilling to share their assessment and monitoring information. Thirdly, many organisations claim capacity and skills they often do not have: care must be taken in the overall planning. Furthermore, a health care system that looks well developed on paper might have serious resource constraints and function only at a fraction of the intended capacity even before a disaster. A common mistake also is to believe that one can capitalise on the host country's health workers; but they are often few in number and also are inevitably affected by the disaster and not in the best shape themselves. Emergency situations change quickly; to obtain funding, donors often demand more thorough assessment and reporting information than is possible to provide. One should include in the evidence based planning the experience from other operations of similar character. Outbreaks and epidemics of measles, malaria, dengue, diarrhoea, tetanus and cholera are regularly seen after two to three weeks. One must, therefore, prepare interventions in advance.

Many relief organisations conduct 'quick and dirty' surveys to gather some data to guide their interventions. Yet they fail to follow up with more detailed assessments to guide the scaling-up and reprioritising of their humanitarian efforts. Because the available data might not be measurable or reliable, the risk is that the responses do not address the priority health needs caused by the disaster. Again, all agencies must ensure that the collected data is shared, carefully processed and analysed to identify priority issues for immediate and long-term interventions. (See the disaster epidemiology chapter for further details about collecting and analysing information).

Erosion of local and indigenous coping strategies

When embarking on any emergency operation, it is important to consider existing disaster response plans and the authorities' implementation capacity. When planning, local ways of coping with the situation must be included in the overall response. Some disasters are seasonal (e.g. floods). The local authorities and organisations probably have developed considerable coping capacities together with the affected communities and their traditional response mechanisms. Each community has the primary responsibility for caring for its own well-being and considerable resilience, disaster preparedness and mitigation mechanisms might already be in place. Yet time and again, humanitarian agencies around the world have rushed to ship in large consignments of relief food without fully appreciating the impact on the local capacity or the role of local communities in determining their own needs. The tragic result is often the gradual erosion of local coping mechanisms, the development of a dependency cycle and the creation of incentives for communities to remain displaced. Therefore, any assessment must incorporate these elements. During the first operational phase, when the primary objective is to provide life saving assistance (safe water, shelter, basic health etc), local and indigenous coping mechanisms are often overwhelmed. When the situation stabilises and even during the recovery phase, all coping mechanism must be boosted, integrated into the management cycle and reach a higher capacity level than before the disaster.

Narrow targeting

Many emergencies occur in developing countries that rely heavily on international aid or external development assistance to provide routine health care for its own people. A large displacement of people can put a heavy strain on local resources. It is crucial that the plight and needs of host communities are also addressed when assisting displaced communities. In their desire for rapid response, relief agencies often try to recruit local aid workers or volunteers. Skilled workers from among the affected population may not be present, and as pointed out, they are also affected by the disaster. As a result, they may be 'lost' or need of specialised support for a while before they can resume normal work. This entrapment will become more challenging in future. The climate change, changing disease patterns, population growth and migration and other factors will result in more frequent disasters, with more heavy impact and increased vulnerabilities will shorten the time for recovery and negatively affect the government capacity to do appropriate recovery work. More than ever, the humanitarian actors in the relief sector have to pay attention to the recovery work, ensuring that communities can return to a reasonable status of 'normality' soonest, with better disaster preparedness, mitigation and resilience.

Human resources

Working in a relief operation places unique demands on relief workers. Many of them work under high stress conditions with little support from headquarters and no career development or future prospects. It is not uncommon for them to leave the agency in search of better opportunities. Again, the early phase of a post disaster situation requires the handling of a huge volume of beneficiaries, concentrating on basic care. Sadly, many relief agencies disrupt the routine health system by poaching on the more competent workers by offering higher salaries and fringe benefits. These tactics are caused by an uncoordinated approach and competition between relief agencies including the UN. Better human resource planning is needed among all concerned stakeholders to assure the smooth running of services. In short, coordination between the government and the supporting relief agencies affects not only the intervention priorities, but also how to make best use of existing human and other resources. Good leadership and team building will also foster team spirit and increase commitment to assisting the most vulnerable. More attention is needed on staff training, motivation, conflict resolution, staff health and welfare. (See the health systems and infrastructure chapter for more details).

Monitoring and accountability

Lack of standards and quality levels for monitoring and evaluating humanitarian agencies' performance has led to unprofessional and wasteful relief operations and, sometimes, unnecessary loss of life. The routine health system might be crippled my more health workers being poached by NGOs and the UN. It is important that the host government, even if it is very weak, establishes a system for NGO accreditation and coordination. Case definitions and treatment protocols must be agreed upon and, if not available at the beginning, the WHO standard, definitions and protocols provide a good start. Common standards such as the 'Code of Conduct', the 'Minimum Standards of the Sphere Project' and the 'Seven Principles of Accountability' are needed to help humanitarian actors to work more effectively and become accountable to local authorities including donors and beneficiaries. Most agencies when establishing health information and monitoring systems are too ambitious by including far too many indicators.

Linking emergency relief with recovery and development

There are distinct phases of any emergency (i.e. pre-emergency, impact and displacement, acute emergency, post-emergency, recovery, and rehabilitation/reconstruction). These phases are not consecutive however, several are on going at the same time, all related to the situation, location and technical areas and each operation has its own feature, where each of the phases might vary considerably time wise. Although each phase requires different interventions and approaches to management, the emergency manager must keep in mind the long-term solution for the affected or displaced population whether it is repatriation, integration, and resettlement. Many disaster-affected populations are displaced for long periods of time as a result of conflict.

Tsunami - Soroptimist International project is rebuilding schools, libraries and 400 homes in Aceh Province Photo: Virgil Grandfield/ International Federation

Unfortunately, funding possibilities for meeting needs during recovery, rehabilitation as well as the need for long-term support is far less than for emergency relief funding. If no provision is made to cover those needs during the follow up phase and long-term support during the relief phase, possibilities for continued support will suffer and there will be yet another 'forgotten' disaster. When funding dwindles because of poor planning during the relief phase, relief agencies often leave abruptly with improper handing over of the relief operation and resources to the local authorities. Relief projects should serve both their immediate and long-term needs of the disaster affected people and ensure transfer of vital skills to the local authorities and affected community. Preparing the beneficiary community and project staff for all possible exit strategies including project expansion will reduce tension and reveal other means of support.

Principles of management

Management is basic to any human activity and a continuous process about making operational decisions and supervising the entire implementation process. Objectives of management include:

- To define the existing problems and the priority needs;
- To integrate the perspectives and priorities of the beneficiaries with those of local authorities and organisations;
- To monitor quality and performance and motivate personnel;
- To make optimum use of resources (local and external);

▪ To coordinate activities and cooperate with other stakeholders.

Management tools

The **planning cycle** can be used as a basic management tool when no standard guidelines exist within an organisation. It comprises of seven key steps that include the initial assessment, detailed action planning based on set goals and objectives and monitoring and evaluation. A series of common sense questions can assist managers with planning. Informed answers will provide a solid base for project planning. The figure below presents the seven stages of project planning with examples of key questions to be addressed during the planning process.

Figure 10-1: The planning cycle
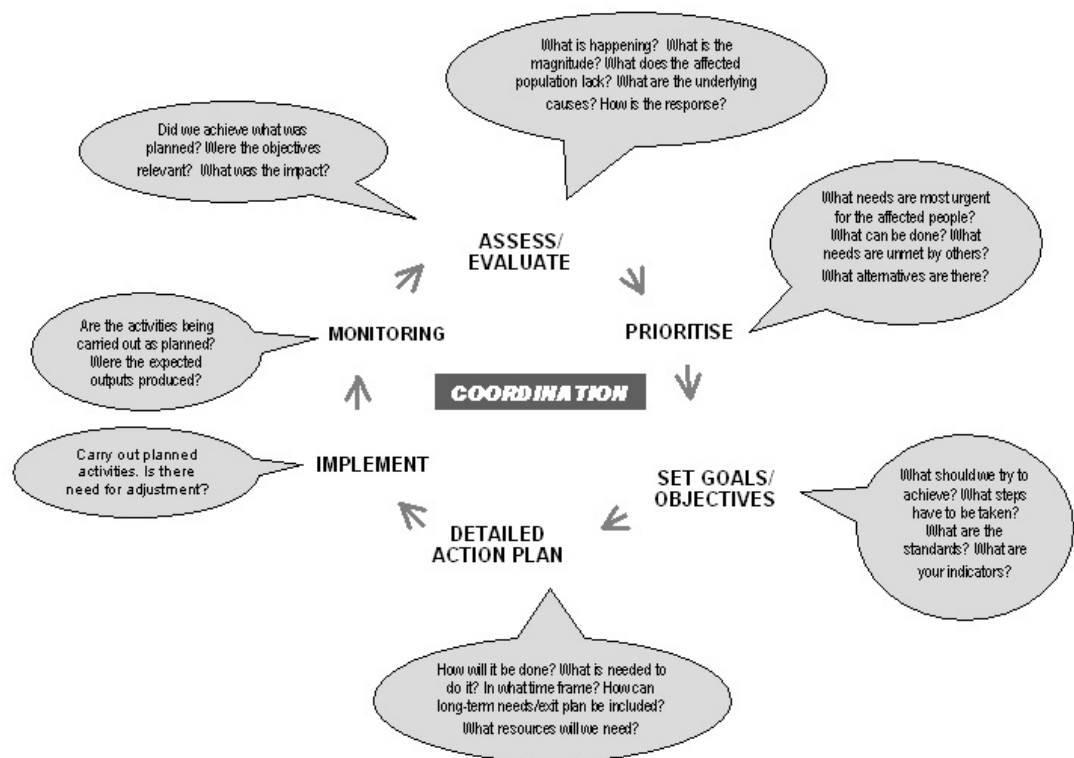
Assess the situation

The first response to a crisis is a rapid assessment that gathers basic information to increase understanding about the magnitude of problems (e.g. the number of people displaced, lack of food, contaminated water supplies and threat of disease outbreaks), the available resources (manpower, supplies, equipment and infrastructure), the response capacity of the host government and other stakeholders and also whether there is a need for additional and external assistance. Because problems are often more complex than they appear on the surface, a more thorough additional assessment is necessary to identify root causes otherwise wrong assumptions can result in planning inappropriate interventions. It is important to understand that assessment is an ongoing process that continues even after a project has been initiated. It becomes part of monitoring and identifying new gaps and ways of improving performance and project outcomes. Equally important for the assessors is a clear view of that which they are to assess: the impact of the disaster itself. The dilemma is often that the affected country or area might be in poor shape before the disaster. One must have a clear view of what extent those factors should

be included. In any case, the preliminary goal is to fill the service gap and meet needs caused by the disaster.

Prioritise the needs

If identified problems and root causes are too many, try to group all that are related to make them more manageable. Identify who is doing what and for how long. Thereafter, use a ranking system to determine which group of problems are top priorities and are likely to have the greatest impact compared to others. However, other less urgent needs should not be forgotten since they are no less important. They should be monitored and reassessed and given more attention as the situation becomes stable.

Set goals and objectives

The overall goal and specific objectives through which the goal will be reached should be defined. **Goals** are *general statements about what one wants eventually to achieve through the programme.* They can be derived directly from the common health needs identified in the assessment. Not more than one or two goals are needed for the overall programme. **Objectives** are *the specific targets or positions that need to be reached in order to achieve the overall goal*. They are the intended results for priority problems identified in the initial assessment.

> ### Objectives should be SMART
>
> ### Specific, Measurable, Appropriate, Realistic, and Time-bound

Ideally, objectives should specify the following:

- The intended type of improvement;
- The target group (e.g. children between twelve to twenty-three months, women between fifteen to forty-five years); and
- The time frame for achieving the objective. Too many agencies are too ambitious and often fail to reach their objectives.

Plan the activities

Specify the actions to be taken to achieve the objectives with the required inputs and the expected outputs. In addition to defining the target population and the project timeline, measurable indicators for tracking progress towards objectives should be identified at this stage. If possible, select a few indicators of quality, although they might be difficult to measure. During the planning process, coordination and cooperation with other agencies, governments and the International Federation is absolutely vital to ensure that there are no service gaps and no duplication of programming.

Implement the plan

Carry out the activities specified in the detailed action plan as necessary to reach the set objectives. Implementation requires regular review of unforeseen challenges or obstacles that might arise and require preventive or corrective actions.

Monitor the implementation

Monitor activities as the programme rolls out to determine whether the outputs are delivered to intended beneficiaries as planned. Monitoring provides information on any deviation from the project objectives and allows managers to make adjustments if needed. It is important to establish a simple, accurate and reliable monitoring system that does not overburden the health workers, but helps them as well the overall responsible managers.

Evaluate the programme

Periodic evaluations must be carried out to confirm if the programme's objectives have been achieved as well as important lessons for future interventions. Important indicators to measure are project impact, efficiency, effectiveness and sustainability. Data from monitoring indicators can also be used in project evaluation. Evaluations are often conducted in the middle and end of the project.

Note: Effectiveness and efficiency are two important measures of good management.

They are defined as:

- **Effectiveness**—achieved by setting the right goals, developing an appropriate strategy for activities, coordinating and monitoring the overall performance to the satisfaction of the stakeholders (beneficiaries, host country authorities etc.);
- **Efficiency**—achieved through assessment, planning, carrying out and monitoring the operation in the most economical (cost-efficient) manner.

The context specific approach

Complex emergencies are defined as 'relatively acute situations affecting large civilian populations, usually involving a combination of war or civil strife, food shortages and population displacement, resulting in significant excess mortality'.[1] This definition is not appropriate because some emergencies continue over decades and food insecurity might occur later. This chapter will consider complex emergencies as situations where death rates among the affected population substantially increases above the population baseline either because of the direct effects of war or indirectly by the increased prevalence of malnutrition and/or transmission of communicable diseases, particularly if the latter result from deliberate political and military policies or strategies (national, sub-national or international). [19]

Note: This definition does not include natural disasters, which are often short-term and require a different response, but might include situations where war does not play a major part (such as famine where government policies contribute to food insecurity) or situations in which food insecurity is not prominent (such as war and civil strife in developed countries).

A context sensitive approach means developing an understanding of the *environment* in which an agency operates, the interaction between the planned interventions, the context as well as acting according to the understanding of the interaction in order to avoid negative impacts and maximise the positive outcomes.

Note: In this chapter the word 'context' is used to represent all socio-economic and political tensions, root causes and structural factors that can fuel conflict which if not controlled might become violent conflict.

Because the situation after major disasters and conflicts is often unstable, using only the traditional project management approach might not capture the changing dynamics. A project that adopts a context-sensitive approach is likely to provide short and longer term assistance that is less affected by existing or potential conflict and produces more peaceful outcomes.

Conflict sensitivity is defined as being aware of past, actual or potential conflict, the likelihood of further conflict and its severity. It also includes the capacity to work with all parties to reduce conflict and/or minimise the risk of further conflict. Good managers of humanitarian aid, peace-building or development programmes must develop a clear understanding of the humanitarian context and existing tensions that might adversely affect the project implementation or its outcome. To maximise the use of limited resources, managers can incorporate the conflict sensitive approach as part of the project planning cycle as follows:

▪ While performing the initial project needs assessment, managers can also carry out a conflict analysis to identify the *causes,* forces, *actors*, and changing *profile* and *dynamics* of existing conflict. Update the findings regularly;

▪ By linking the conflict sensitive approach with the traditional project planning cycle, managers will ensure more conflict-sensitive planning, implementation, monitoring and evaluation. Training volunteers will also ensure that basic health care services are provided by the community themselves with only occasional support or delivery of humanitarian aid goods;

▪ By planning, implementing, monitoring and evaluating planned project interventions in a conflict sensitive manner might sometimes involve re-designing strategies and activities to minimise tensions.

The figure below shows how the context sensitive approach can be integrated with the project planning cycle.

Figure 10-2: Context-sensitivity planning cycle
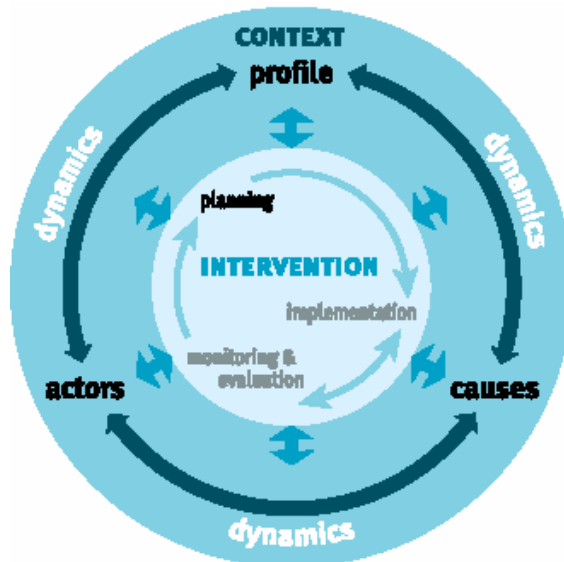
Conflict analysis is a systematic study of the profile, causes, actors and dynamics of the conflict. Humanitarian development and peace-building agencies perform conflict analysis to develop a better understanding of the context they work in, to measure the interaction and potential impact of their programme to that context and determine how capacity can be built among beneficiaries for them to help themselves. It helps reduce negative impacts from their intervention while maximising the positive.

Conflict analysis can be performed at any level of the response while linking with other levels if needed. Like the needs assessment, ongoing conflict analysis of underlying causes of a complex emergency helps improve understanding of the likely impact of the

humanitarian response on the context (e.g. effect on conflict, corruption etc.). Although there are no standard indicators for conflict analysis, monitoring and evaluation, the table below offers some key questions that could be applicable to many emergency situations.

Table 10-1: Key management questions for emergency situations

Profile	Dynamics
What kind of conflict forces are we dealing with?	What are the current conflict trends (increasing or reducing)?
What are its consequences?	What triggers more violence and what factors contribute to peace?
When did it start? How did it develop over the last years?	Are there peace initiatives? At what level? What have they achieved?
What phase of the conflict are we in?	What scenarios can be developed from the analysis of the conflict profile, causes and actors (best case and worst case scenarios)?
Where does the conflict take place?	
Causes	**Actors**
Why did the conflict start?	Who are the main actors in the conflict? What are their interests, positions, capacities and alliances?
What are its root causes (ethnic, religious, economic, migration, environment, security)?	What capacities do the conflict parties have to continue the conflict?
What factors contribute to prolonging the conflict?	Are there capacities for peace?
What triggers could contribute to the outbreak or further escalation of conflict?	What are the analysis's conclusions for selecting partners and beneficiaries?
What new factors contribute to prolonging conflict dynamics?	
What factors can contribute to peace?	
Effects on the population, beneficiaries	**Victims, who are they?**
Where are they? Does anyone reach them with assistance?	Are they part of the conflict, i.e. from different warring parties and ethnic groups, religious elements?
Population movement, camps?	Poverty level?
Their normal livelihood disrupted? How do they manage?	Does the conflict a rural or urban setting?
Resilience, capacity to cope?	With most men out fighting, do mothers, children and the elderly stay behind?
Normal health service level, disrupted, access?	Gender issues?
What is the basic living situation, i.e. access to water and sanitation, shelter, schools?	

Some local and international aid workers might not appreciate the need for a context sensitive approach, particularly those managing post-conflict situations. They may be too busy focusing on relief distribution to recognise that their limited assistance to a minority group might be worsening tensions within a larger context. It is important to conduct a conflict analysis and to enhance the response to the emergency context. This enables managers to detect early if what they are doing is actually doing more harm than good and adjust their plans accordingly. Sometimes long-serving staff might be less concerned because of the trust they have developed with the beneficiaries, while new staff might become over-sensitive. Nevertheless, it is better to empower all staff to perform conflict analysis and planning so they do not operate in ignorance.

During contextual analysis, cross-check findings with other sources of information to broaden understanding and the interactions. Because of the highly political nature of the information gathered however, conflict analysis should be conducted with caution and its findings kept confidential to avoid exposing interviewers or respondents to risk. Required skills for good conflict analysis include technical know-how, un-derstanding the context and its history, cultural sensitivity, a proficiency in the local language, competency in monitoring and evaluation. Since conflict analysis can only portray a 'snap shot' of an evolving complex emer-gency, it is important to continue with ongoing conflict monitoring and evaluation.

Many tools for conflict analysis have been developed by international NGOs, UN and donor agencies and other institutions e.g. CARE's Benefits/Harm Handbook, UN's Early Warning and Preventive Measures and the International Federation's Better Programming Initiative (BPI). When deciding which tool to use, review the aim, methodology and resource implications to determine its appropriateness. The figure below describes the '*Better Programming Initiative*,' which is a conflict analysis tool developed and used by the International Federation to assess the impact of humanitarian aid for fostering long-term reconciliation and recovery in six countries. The practical training approach of the BPI tool has been useful for planning and capacity building in conflict analysis.

Table 10-2: The better programming initiative

Aim of better programming initiative (BPI)	To assess the positive or negative impact of International Federation's aid programmes for communities recovering from violence or conflict.
Main steps and process	Includes a context analysis, review of the aid programme, identifies the impacts, finds alternative options and repeats the analysis as often as the context demands or project cycle indicates
Lessons learnt	▪ **Assessing needs**: Well planned aid programmes ease suffering, reduce vulnerability and provide a genuine foundation for recovery. However, the BPI pilot shows a thorough needs assessment is not enough unless it is accompanied by in-depth analysis and understanding of the context. At the level of intervention, it serves as a springboard for longer development activities. ▪ **Designing programmes**: BPI shows that when the International Federation supports its National Societies that are engaged in rehabilitation programmes linked to political settlements. One must carefully examine the conditions under which it is working. Some groups might oppose the settlement and recovery plan if they see former enemies also receiving aid and resources. The type and allocation of assistance might also be an issue. ▪ **Selecting and accessing beneficiaries**: The International Federation and its National Society staff found that the most common way to diminish tensions is by selecting beneficiaries after thorough analysis of the needs of all groups affected by conflict.

The logical framework

The logical framework also known as the log frame is a tool that helps project developers think logically about what a project is trying to achieve **(the objectives)**, what the project must do to achieve them **(the outputs)** and what has to be done to produce these outputs **(the activities)**. The logical framework can also be a basis for a plan of action as well as a budget. This is mainly applicable in the stabilising phase, during recovery and rehabilitation/ development and, to a certain extent, during conflict situations. During a sudden onset disaster's first week or two, log frames might be less helpful as the fluid situation often necessitates redirection of the operation on a daily basis.

In other words, the logical framework is simply a tool that provides a basis for planning and managing projects. It looks like a table (or framework) which presents information on key project components in a clear, concise, logical and systematic way. Originally developed in the US, the log frame model has become popular among donors. The log frame's simplified presentation of a project summary makes it appropriate for planning as well as monitoring and evaluating the projects. However, for a log frame to guide project implementation, it must contain more information about the inputs, outputs and activities without being too detailed. The following information must be filled in a log frame in a standard format:

- What is the project going to achieve?

- What activities will be carried out to achieve its outputs and purpose?

- What resources (inputs) are required?

- What are the potential problems which could affect the success of the project?

- How the progress and ultimate success of the project will be measured and verified?

Table 10-3: The logical framework

Objectives	Measurable indicators	Means of verification	Assumptions
Goal: To improve survival for earthquake victims through high quality care			
Purpose			
Outputs			
Activities			

The log frame is appropriate for planning and managing emergency and post-conflict projects because it can be adjusted to changing situations. If the log frame is developed in a participatory manner by those who will be directly responsible for implementation, it might not require any major changes. To ensure the information is correct, project managers can seek answers to the following questions:

- What impact will the objectives and indicators have on current work?

- What is realistically achievable?

- Is there enough time to gather the required information?

- Are its assumptions realistic? Do they reflect their working conditions?

The size of a log frame depends on the complexity of a project. For large humanitarian programmes, each purpose in the log frame represents individual sub-projects with their own expanded log frame matrix. Also note that some outputs of one project might represent inputs for another e.g. training.

Note that there is no entirely suitable log frame matrix. Good log frames are developed through wide consultation with key stakeholders, including other organisations and the government to guarantee, coordinated efforts. Preferably, the beneficiaries should participate. It is important to involve staff that can actually implement the project so that they can confirm whether proposed objectives, activities and assumptions are realistic. Log frames are best developed from the time a project is being formulated so that required baseline data can be gathered at the same time. When the log frame has been completed, invite someone with experience in developing log frames to review and give feedback. Once it is approved by donors, use the log frame for project monitoring and evaluation. Some assumptions and indicators in the log frame might have to be updated periodically. This should only be done after consulting with the donor and other key stakeholders.

The systems model

The **systems model** is a management framework that allows managers to focus on the *process* of providing public health services in order to produce better results. It helps them identify a programme's the key elements, which include resources (*the inputs*) for carrying out a set of activities (*the process*) to achieve the expected results (*the outcomes*) as shown in the Figure below. The model defines the relationship between what is needed and what should be invested, and between what is invested and what is actually achieved. The processes occur within a 'structure' such as the context, the health policies, practices and location of health facilities.

Figure 10-3: The systems model

INPUT ⟶ **P R O C E S S** ⟶ OUTCOME

The link between what goes into Primary Health Care services and what comes out at the end is an important management concept. The *process* is the focal point of both planning and evaluation. Some managers look only at what goes into a project. Others look at what comes out. Most cannot explain why things go wrong. The systems model helps managers to gather and analyse information on the key processes of health care delivery so that they can identify weak links and take appropriate action when things go wrong, for example:

▪ Poor outcomes of a programme (e.g. a rising incidence of common diseases and high death rates) may be due to insufficient inputs (e.g. lack of vaccines) and/or incorrect processes (e.g. poor storage of vaccines);

▪ Flawed inputs (e.g. frequent stock-out of essential supplies, poorly performing staff) require better quality of inputs (e.g. regular drug supply, trained staff) in order to improve the quality of outcomes;

▪ Deficient processes (e.g. wrong diagnosis, delayed referral) require corrective action (e.g. job aids, supervision) rather than simply improving the quality of inputs.

The systems diagram for diarrhoea control shows the link between the management services and Primary Health Care (PHC) sub-systems and also defines different outcomes (outputs, effects, impacts). The outcome of management services (e.g. improved staff skills and motivation) leads to improvements in PHC service inputs and processes. The result of training a Community Health Worker (CHW) and community based volunteers in oral rehydration therapy (ORT) and providing an adequate stock of Oral Rehydration Solution (ORS) should be a more capable CHW and community based volunteers who provide better service to the target population. The International Federation Community-Based First Aid programme implemented worldwide use volunteers recruited from the communities themselves, working on prevention and care like provision of ORT. This is applicable to emergencies as well.

By linking all the components in a systems diagram (inputs-process-outputs-effects-impacts), the systems model can be used for planning, monitoring and evaluating programmes. A logical **IF-THEN** relationship is observed within the linked processes of systems diagram for diarrhoea control. This relationship helps programme planning, monitoring and evaluating as follows:

▪ **Planning**—Work backward from the known health needs of the affected population. Distinguish between needs present before the disaster and needs caused by the disaster. The overall picture can be obtained from the community-based Health Information Teams (HITs), which are not necessarily health workers but well trained volunteers combined with data collection in health facilities. Analyse the data in the Health Information System (HIS) to identify the impacts, effects and outputs, the processes and, finally, the inputs.

Figure 10-4: The systems framework and the planning and evaluation cycle
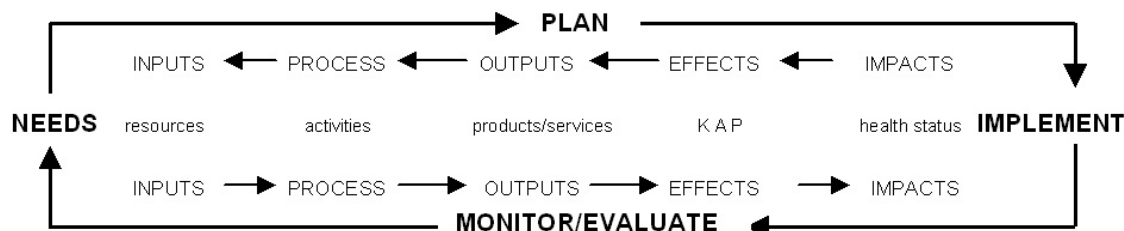
▪ **Monitoring/evaluating**—Work forward to ensure that what was planned is actually being carried out. Ensure that inputs are processed as planned to bring about the planned effects and monitor the impacts. This ensures that the priority health needs are met.

Using management tools

In acute emergencies, reaching out to the community effectively is more important than efficiency. It is better to get the right things done than to do the wrong—or irrelevant—thing most efficiently. However, prolonged use of products, procedures and services that are too expensive will eventually interfere with effectiveness. This should always be remembered, but should not serve as an excuse for poor planning and implementation of a relief programme. Both the planning cycle and the systems model can be used to improve the efficiency and effectiveness of a relief project.

A practical approach to managing of a relief project is described in the next sections with each step of the planning cycle.

Project planning in emergencies

Assessment

Figure 10-5: The project planning cycle—assessment
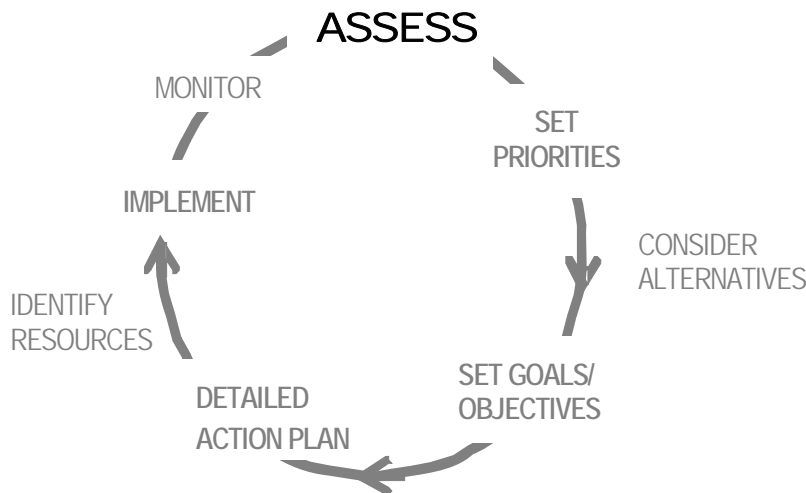
Conducting an assessment

As discussed in depth in the epidemiology section of this book, many humanitarian and development agencies carry out some form of needs assessment as the first step toward defining their entry point and plan their response to an emergency or post-conflict situation.

The objectives of the assessment can include the following:

- To determine the magnitude of the crises in the affected area;
- To appraise the present and potential threats to life, dignity, health and livelihoods;
- To evaluate the local response capacity, the condition of the health care system and determine what resources are available and what is needed;
- To determine if external assistance should be requested and the nature of the response;
- To establish the basis for a health and management information system.

The early assessment is a rapid survey, where there has to be a trade-off between accuracy and timeliness. Using an experienced assessment team like the International Federation's Field Assessment and Coordination Team and an epidemiological approach to data collection and analysis will prevent many mistakes and produce information that will improve response planning. The scope, duration and approach to a rapid assessment often depend on the urgency to respond to the disaster, the skills of the assessment team and the existing constraints (e.g. poor access). Many assessment checklists have been developed to help teams identify critical information they need to collect during a rapid assessment. Later, more in-depth assessments on priority health or other management issues must take place e.g. nutritional surveys or training needs assessment can be organised once an agency decides to respond to the emergency. The in-depth assessments need two to four weeks. The table below shows various assessment methods, the approach and use of findings.

Table 10-4: Management assessment methods

Method	Focus	Tools	Use of findings
Fly-over or walk-through tour	Gather information on any service delivery point or people living in a community.	Observation checklists	Can provide general insight on the scale of the emergency and critical location(s), access and technical areas needing improvement
In depth survey	Gather information on any service delivery point or people living in a community.	Questionnaires	More objective evaluation about baseline status, focusing on priority areas, project outcomes and impact on the affected community
Record review	Gather information on any service delivery point.	Checklists	Provides insight of work load and quality of record keeping
Focus group discussions	Gathers group feedback and perceptions.	Semi-structured questionnaires	Semi-structured questionnaire
Key informant interviews	Gather individual or expert feedback or opinion.	Semi-structured questionnaires	Can evaluate operations or performance (may be biased)

(See the health systems and infrastructure and the disaster epidemiology chapters for more details about designing, conducting and reporting on rapid assessments and surveys).

Case study: the Ethiopia famine, 2000

Importance of rapid health assessment[19]

Most complex emergencies occur across large geographical areas where access is difficult and coverage is lower compared to camp situations. High mortality can occur in these situations and humanitarian interventions might be less effective for example in the late 1990s Ethiopia, when at war with Eritrea, experienced severe drought for three consecutive years. Unfortunately, the food security crisis did not attract serious international attention until early 2000. Subsequent humanitarian interventions neither averted widespread food shortages nor high mortality rates, particularly in the already marginalised Somali region. Average crude mortality rates of 3·2 deaths per 10,000 people per day were recorded for more than seven months resulting in an estimated 6,070 deaths in Gode district alone. Excessive focus of the humanitarian response on food-based interventions without appropriate preventative health services might have contributed to the excess mortality due to measles among children under five years of age as well as older children.

To be effective, humanitarian response needs to be rapid to achieve high coverage with multi-sectoral interventions that meet minimum standards of quality. If a proper epidemiological assessment had been undertaken for the Somali pastoralist population, the measles outbreak could have been detected and a more comprehensive intervention that would have included measles vaccination for ages up to twelve or fourteen years. Although most deaths occurred before any humanitarian response, measles intervention alone could have saved thousands of lives in the Ethiopian famine during 2000.

Assessing the scale of the emergency or disaster

A critical starting point for planning the type and scale of humanitarian assistance is obtaining timely, accurate and reliable information on the *number* and *location* of people affected by a crisis. Poor population estimates result in fragmented, insufficient and delayed interventions. Unfortunately, most humanitarian agencies do not have a standard method for assessing population size and instead rely on *existing data* there are however, many problems with existing data that for example might not be current, different communities might be grouped together, different names might refer to the same village and there might be no consideration of in- and out-migration.

The following methods have been used for estimating population size in refugee camps:

- Using low-level aerial photography or remote sensing when there are large numbers of displaced people in a large area;

- Counting the number of people passing entry or transit points when there are rapid population movements in a defined area;

- Estimating the number of shelters and the average number of people per shelter when there is a small or orderly site;

- Estimating the total area of the site, counting all the people in randomly selected blocks of equal area and extrapolating the population density of these sites to calculate the total population when there is a large or disordered site.

Note: Whichever method is selected, every population estimate needs to be cross-checked with other methods.

Only a few publications provide practical guidance on measuring population size in humanitarian emergencies. There is the Rapid Health Assessment of Refugee or Displaced Populations by Médecins sans Frontières which describes methods for conducting rapid counts of people in small, confined areas as well as the software, EPOP, to define the area to survey and calculate population size. (See the health systems and infrastructure and the disaster epidemiology chapters for more details about designing, conducting and reporting on rapid assessments and surveys).

Contextual and root analysis

Depending on the resources available and the situation's context, a rapid conflict analysis can be performed jointly with the health needs assessment for emergency or post-emergency situations. Each assessment can also be performed separately in greater depth. Combining the two processes will assure more context-sensitive planning. Both assessments must be co-ordinated with the local authorities and other agencies to facilitate the sharing of information and minimising duplication of efforts. The affected community must also participate in the assessment and project planning, even though involving all communities in conflict analysis might either revive tensions or help break down fear and mistrust so that their recovery can begin. The figure below illustrates how public health threats and at-risk populations in developed countries can differ significantly from those in developing country emergencies.

Case study: Kosovo, 1999

Need for a context-sensitive approach[19]

As well as guiding the humanitarian response, context sensitive analysis is useful for reporting on human rights violations through ethnic cleansing. In Kosovo, the primary cause of death among civilians was not communicable diseases or malnutrition. Throughout the emergency situation, war-related trauma (a deliberate violent targeting of civilians for political purposes) and chronic diseases such as ischemic heart disease, diabetes and renal disease were important causes of death. These accounted for an increasing proportion of deaths as access to health services decreased during the NATO bombardment and the Serbian counteroffensive. Furthermore, men had much higher mortality rates from war-related trauma than women. Because of their relative inability to flee the violence and their special socio-cultural importance in the community, older men had the highest conflict-related mortality rates. Such diverse causes of death demand non-traditional responses from aid agencies. In the interests of primary prevention, humanitarian agencies must understand how to use such data or at least establish partnerships with human rights organisations that can advise on a better response.

By the end of the assessment, findings will reveal numerous problems. Unless these root causes are identified, most problems will not be well understood and the selected response might not be effective. Gathering the perspectives of the affected population on root causes is likely to give better insight into the linkage between health and the context of the humanitarian emergency as described below.

Qerret-Kavaje, Albania, 14 July 1999 Albanian Red Cross worker unloads relief supplies delivered to vulnerable Kosovo refugee family near Durres, Albania.
Photo: Mikkel Oestergaard - Federation

Management

Case study: eastern Burma, 2006

Health consequences of human rights violations[3]

The breakdown of health services, corruption, both widespread poverty and human rights abuses have resulted in grave health consequences for internally displaced persons in the eastern conflict zones of Burma. Health indicators such as population pyramids, infant and child mortality rates as well as maternal mortality ratios mimic more closely countries facing widespread humanitarian disasters such as the Democratic Republic of the Congo, Sierra Leone, Niger and Angola. The following table quantifies the health consequences of various human rights violations based on findings of a human rights survey by the Back Pack Health Worker Team.

Human rights violations in preceding twelve months	Linked health consequence	Odds ratio*
Forced relocation	▪ Childhood (under five) death	2.4
	▪ Childhood malnutrition	3.1
	▪ Decreased use of contraception	6.1
	▪ Landmine injuries	4.5
Food insecurity	▪ Overall death	1.5
	▪ Moderate child malnutrition in household	4.4
	▪ Severe child malnutrition in household	2.0
	▪ Landmine injuries	4.6
	▪ Head of household suffering from malaria at time of survey	1.7
Forced labour	▪ Diarrhoea in two weeks prior to survey	1.6
	▪ Night blindness (vitamin-A deficiency)	2.1

Ratios compare the odds of linked health consequence to households that have not *suffered the above listed human rights violations. Ratios with values greater than 1 signify that the consequence is greater among households that have suffered human rights violations.*

The above results clearly demonstrate how closely the poor health status of IDPs is linked to the human rights context. Long-term and sustained reduction in overall morbidity and mortality cannot be achieved by simply improving access to health services. Any intervention needs to be combined with strong pressure from the international community for economic and political change.

The figure below, from the Sphere Project, illustrates how a problem tree may be a more simplified means for illustrating root causes for various poor health outcomes.

Figure 10-6: health problem free
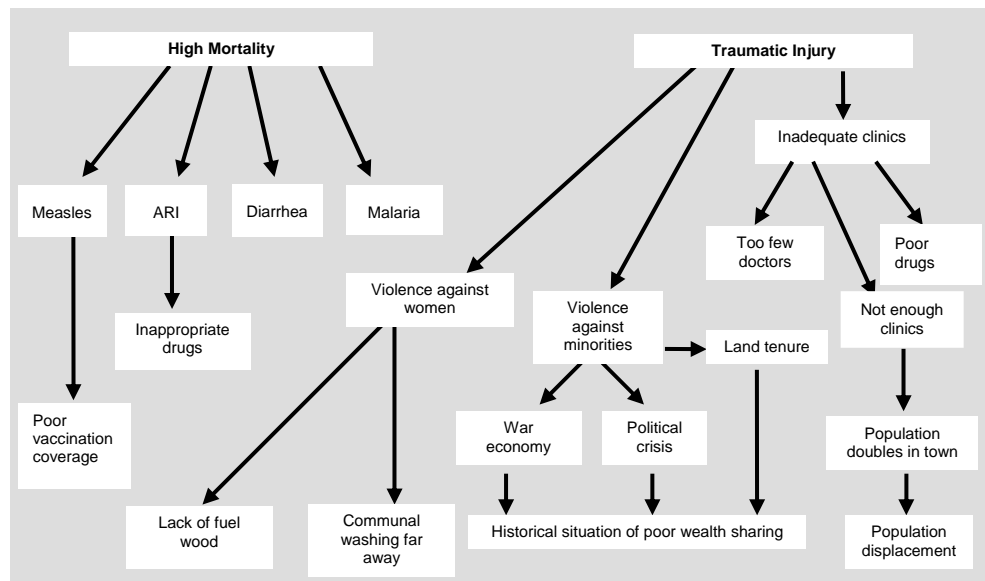
The table below illustrates how identifying root causes of problems can improve decision making.

Table 10-5: From root analysis to defining interventions

Problem	Immediate conclusion	Underlying cause	Decision based on toot cause
There is an acute shortage of staff	Recruit more health workers	Many staff affected (displaced, killed, lost houses) by the recent floods Incoming NGOs are offering better terms of services	Stabilise displaced staff Improve working conditions
Displaced population is not utilising the clinics	Health care is not among the top priority for the displaced people or they feel unsafe to use them	There is lack of privacy within the facility Clients are not aware of which services are available Security or too far away	Make clinics more user-friendly Raise community awareness about available services Remove security problem
Drug stock outs are quite frequent	Urgent order for large drug consignment	Seasonal epidemic for malaria was prolonged The pharmacy staff are not trained in drug procurement	Train pharmacy staff in drug procurement and forecasting

Note: There are many techniques for identifying root causes e.g. the fish-bone analysis. However, discussion of these techniques is beyond the scope of this chapter.

The above mentioned root cause analysis can also be complemented with conflict analysis. An integrated approach will expose other critical underlying issues such as

power and powerlessness that can increase vulnerability and reduce access to services and other resources.

Reporting rapid assessment findings

After the assessment, a report needs to be produced, describing the following:

- Impact of the disaster on the target population (e.g. poor health status of children under five);
- Available and capacity of services;
- Existing resources;
- Capacity of the local response;
- Identify present and incoming actors, causes, profile and dynamics of the conflict;
- Link to supporting longer term development activities.

The perceived needs of the affected population and any suggested interventions should be included in the report. It should be sent to the host country's ministry of health and ministry of internal affairs, to the cluster if in place, the headquarters of the agency conducting the assessment and other local and international agencies and donors. The conclusions should enable decision-makers to determine if external assistance is required otherwise any data collection that is not linked with decision-making and feedback is a waste of resources.

Any request for external assistance should follow a hierarchy of needs:

- **Basic life support needs** including food, water, sanitation, shelter, and health care;
- **Security and protection** from physical violence and aggression (especially in conflict situations);
- **Psychological and social needs** due to the stressful effects of the disaster.

Figure 10-7: Outline for a rapid assessment report

Executive summary:	disaster being addressed, programme planned and resources needed;
Survey:	by whom, when it was carried out, objectives and methods used;
Background of disaster:	origin, impact and forecast of evolution of disaster;
Affected population:	size, age/sex composition, general condition, casualties/death rates, disease pattern, condition of host population;
Current response:	relief measures so far;
Needs and resources:	existing health services and facilities, other services and unmet health needs (security, access etc.), access to safe water, psycho social needs*;*
Capacities:	of disaster victims, host country, local NGOs, other organisations;
Recommendation:	aim/strategy for action, priority areas, target beneficiaries, programme implementation;
International aid needed:	equipment, supplies, technical etc.;
Forthcoming reports:	equipment, supplies, technical etc.;
Appendices:	maps/country profiles of affected areas, data analysis of assessment, programme design, description of other relief actions, contact names/addresses;
Special observations:	weather, logistics (transport, condition of roads and rail etc).

Establishing a health and management information system (HMIS)

As soon as an agency decides to establish a relief programme, its first step should be to establish a HMIS which consists of people, equipment and procedures organised to provide information to health workers in a way that enables them to make informed decisions. As well as documenting health and nutritional status data of the displaced population, a Health and Management Information System (HMIS) can store information related to programme management.

1. Programme inputs—Availability of resources such as:

▪ Facilities and equipment (health centre, beds);

▪ Staff (beneficiary population, local, expatriate);

▪ Basic supplies (food, shelter material, domestic equipment);

▪ Energy sources (fuel, charcoal);

▪ Transport.

2. Programme process—Access, coverage, and quality of interventions such as:

▪ General food distribution and supplementary feeding;

▪ Potable water supply;

▪ Latrine construction;

▪ Immunisation;

▪ Ante-natal/pre-natal care;

▪ Health services;

▪ Psycho social services.

Only a small number of quantitative and qualitative indicators are needed to monitor the progress of humanitarian programme implementation. Information can be gathered through routine reporting systems, supervision visits, activity reports and periodic, population-based surveys. Baseline information from the initial assessment must be incorporated into a HMIS that also provides standard definitions for the indicators, the data sources, frequency of data collection, baseline levels and targets. This allows aid workers to track any changes in health status of the affected population over time. Later, a HMIS can also help evaluate the project's achievements. The table below provides a simple framework for a HMIS with examples of management indicators.

Table 10-6: Example of a HMIS framework

Ref No.	Indicator	Type/ Freq.	Definition	Numerator	Denominator	Level of user	Data collection method	Base-line	Target
1	Health centres where all essential drugs are available	Input/ yearly	% of health centres with sufficient supplies of essential drugs	Number of health centres visited where all essential drugs are present	Total number of health centres visited	National, provincial, district	Routine reporting system, supervision reports	20%	60%
2	Health care units with at least one health worker trained in primary health care	Input/ yearly	% of health facilities with at least one health worker trained in primary health care	Number of health facilities with at least one health worker trained in primary health care (within the past two years)	Total number of health facilities in geographical area	National, provincial, district	training records, supervision reports	40%	70%
3	Health care units where standard case definitions and standard treatment guidelines are available	Input/ yearly	% of health facilities with at least one copy of standard treatment guidelines	Number of health facilities visited having at least one copy of standard treatment guidelines	Total number of health facilities visited	National, provincial district	Supervision reports	15%	80%

Data collection for Health and Management Information System (HMIS) should not be limited to health facilities. The figure below gives an example of a community-based health information system that may be linked to the overall project HMIS.

Example: How to collect data for a Health and Management Information System

The International Federation recruits **Health Information Teams** (HITs) to make contact quickly with the community and establish information flow. They monitor health posts, food availability, water, sanitation, disease control measures, health education etc. Traditional Birth Attendants, Community Health Workers (CHWs) and teachers are favoured for recruitment. Members of vulnerable/victimised groups are recruited for maintaining communication between the targeted community and peripheral clinics.

HITs form a vital link between the community and the peripheral clinics, where the really sick are referred to. They receive training each week e.g. on use of Oral Rehydration Solution ORS, how to dig latrines, promote breast feeding etc. Later, they will become CHWs.

Many constraints can hamper the setting up of an HMIS e.g. HMIS might not be considered as a priority, especially in the acute emergency phase, the HMIS staff might lack the essential knowledge and skills, there is no feedback on submitted reports and, finally, there is a tendency to gather quantitative indicators.

(For details about calculating HMIS indicators, setting up surveillance and surveys, please refer to the chapter on disaster epidemiology. For more details about setting up a health information system, refer to the chapter on Health Systems and Infrastructure).

Setting priorities

Figure 10-8: The project planning cycle—Set priorities
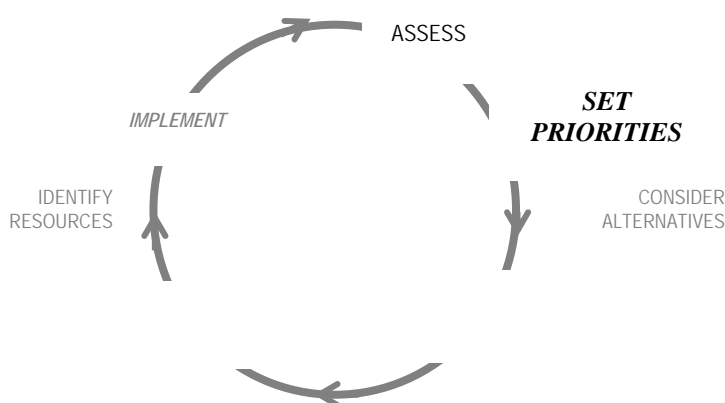
Once the first assessment for a relief programme has been completed, the next planning step is to set priorities. Because it is not practical to address all problems identified in the assessment at once, it is important to develop a clear understanding of which specific problems must be considered as the most urgent. Involving members from the affected population will improve the decision making process. A **priority matrix** is a practical method for planning team to rank identified problems. The team first must agree to a set of criteria for ranking.[11] The following set of criteria can be used for ranking identified health problems:

- **Seriousness of the disease**—What will happen if the problem is not addressed e.g. increased deaths or disability? A high prevalence of TB among a displaced population might increase the incidence of the disease in the host population;

- **Prevalence of the disease**—What is the disease's total number of cases among the target population at a given period of time? What is the likelihood of an outbreak?

- **Feasibility of control**—Can the health problem be controlled by the available resources (technology, staffing, funding, supplies) considering the existing constraints such as a lack of security, transport delays, inadequate staff skills, budget restrictions etc.?

- **Community acceptance**—What is the likelihood of gaining the community's support for the disease intervention considering the community's perceptions and demands? Also consider what is likely to happen in the future.

The priority matrix below shows how each health problem has been scored against a set of criteria, from one to four. A score of one is considered as the lowest priority and four as the highest.

Table 10-7: Priority setting matrix for public health

Health problems	Prevalence	Seriousness	Feasibility of control	Community acceptance	Additive scores	Multiplicative scores
Malnutrition	3	3	3	3	12	81
Diarrhoea/ Dehydration	3	4	3	4	14	144
Tetanus	2	4	2	3	11	48
HIV/AIDS	1	3	4	3	11	36

Note: Multiplicative scores are calculated by multiplying all the factors rather than just adding them. This can produce a more sensitive score for comparing health problems that have equal scores after addition. In the above matrix, diarrhoea is ranked as being of the highest priority followed by malnutrition with HIV/AIDS being ranked as the lowest priority.

The consequences of not addressing the poorly ranked health problems should be considered. For example, failing to introduce HIV control measures when a local population has an HIV prevalence above 5% can increase the risk of transmission among the displaced community.

Similarly, the priority matrix might also be used for selecting the most appropriate intervention or action to address the identified priority problems. The first step would be to identify the criteria for examining the strengths and weaknesses of each proposed intervention. The matrix below considers each activity against four important criteria on a scale of one to three (one being the least benefit and three, the most):

▪ **Possible to prevent**—What measures can be put into place, use of volunteers etc?

▪ **Time to implement**—How fast can the intervention be completed with satisfactory results?

▪ **Finances and resources**—Is the proposed intervention affordable? How many other resources are needed to support implementation (e.g. funding, equipment, manpower)?

▪ **Potential impact**—What are the likely long-term outcomes or results of the intervention?

▪ **Sustainability**—Are systems in place to support this intervention? Can this activity keep going if there are funding cuts in the continuation phases of the project?

Table 10-8: Priority matrix for ranking possible activities

| Health problems	Time to implement 1 = long 3 = short	Finances and resources 1=highest cost 2=lowest cost	Potential impact 1=least potential 2=highest potential	Total score
Training of service providers	2	3	3	**8**
Raise community awareness	2	6	2	**10**
Setting up a treatment centre	1	2	2	**5**

Note: If some criteria are considered more important than others, they can be given a higher value (e.g. double points). In the above table for example, time to implement can be multiplied by 1.5 if the results must be achieved immediately. This process is known as 'weighting'.

The above table indicates raising community awareness about the causes and prevention of diarrhoea as the top priority but setting up a treatment centre as the lowest. Although the scoring and ranking process appears to be a logical way for making decisions, the results still need to be considered against other factors to see whether some options deserve more attention. Most proposed activities can be implemented at some point during the project life, but more efforts must focus on top priority actions.

Some agencies start with pre-defined interventions according to their organisational mandate. They use the findings from the needs assessment and conflict analysis to confirm which are the most appropriate. Other agencies wait to see the findings before defining their interventions. It does not matter when the interventions are defined as long as a context sensitive approach is applied during planning and implementation. If one considers the examples in the table above, findings from the conflict analysis can help managers determine the right beneficiary group, the location and appropriate approach for raising community awareness and with whom.

Setting goals and objectives

Figure 10-9: The project planning cycle—set goals/objectives
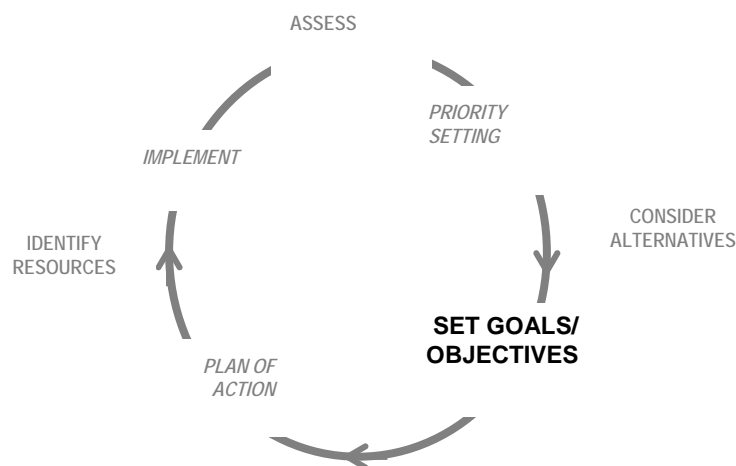
Once the priority problems and actions have been identified, the next step is to define the appropriate goal and objectives for an organised emergency response. Most humanitarian projects have only one or two goals. However, each goal may be linked to several objectives. The primary goals of most humanitarian agencies responding to an emergency or post-conflict setting are *to prevent and reduce excess mortality and morbidity* and *to promote a return to normalcy*. Below are examples of objectives that are *not* SMART (Specific, Measurable, Attainable, Realistic, Time-bound):

▪ Increasing the immunisation coverage—neither specific nor time-bound;

▪ Increasing mothers' use of oral rehydration therapy for all children with diarrhoea to 100% within one year — may not be appropriate and gives no idea of baseline;

▪ Ensuring access to basic health care for the affected population—not measurable.

Examples of better defined goals, objectives and indicators are shown in Table 10.9 below.

Table 10-9: Worksheet for identifying goals, objectives, and indicators

Target group	Goal	Objective	Objective indicators
Total population	To promote a return to normalcy for the disaster affected population	Reduce the incidence of the three most common diseases to host population levels within six months	No. of cases diagnosed with the three most common diseases within a six-month period /Total population
		Provide the basic needs to all affected persons, including fifteen litres/p/day of potable water within the first three months	% population who received at least the recommended minimum of basic needs
Children under 2 years	To improve the survival of children under two years	Reduce mortality among children under two years to a rate of 90 per 1,000 live births within one year	No. of deaths of children < two years per total no. < two years
		Decrease the prevalence of third degree malnutrition among children < two years by 30% within 6 months	No. of cases of third degree malnutrition among children age < two years/total no. age < two years
Women 15-49 years	To improve the reproductive health status of women of child-bearing age	Increase the prevalence of modern contraceptive use among women aged fifteen to forty-nine years from 10% to 15% within one year	% women aged fifteen to forty-nine years who are using a modern contraceptive method
		To increase the coverage of ANC by 50% within thee months	No. of pregnant women attended by a health worker at least once for pregnancy-related reasons

Sometimes people define objectives about what they are going to do. These are *process* objectives which often represent *methods* i.e. they indicate how an intervention will be carried out. Process objectives are important management tools for monitoring quality. Project planners must define what they intend to *achieve* i.e. the desired *outcome* objectives. The table below distinguishes between *process objectives* and true *outcome objectives*.

Table 10-10: Differentiating between outcome objectives and process objectives

Outcome objectives	Process objectives (Methods)
To reduce the incidence of measles among children < two years to host country levels within one year	To provide measles immunisation services weekly at all health centre and do monthly outreach for all children < two years within one year
To increase the average breast feeding period to at least eighteen months among children < two years within one year	To provide for one year, bi-weekly individual and group counselling to motivate mothers to breast-feed children till the age of two years.
To reduce the prevalence of malnutrition among children under five years from 15% to 10% over the next three months	To improve the food supply from an average 1,900 to 2,200 Kcal food/p/day to all displaced persons over the next three months
To raise the prevalence of modern contraception to 25% among women of childbearing age within one year	To extend the availability of information and services for modern contraception to all women of child bearing age within one year
To reduce the incidence of diarrhoea among the children < five years by 75% within six months	To increase the potable water supply in the district by 25% within six months

A context sensitive approach is also needed when defining project goals and objectives. Findings from the conflict analysis can be used to predict whether the context could interfere with achievement of set goals and objectives. The planning team needs to consider what is feasible based on the mandate and capacity of the organisation and other factors, i.e. factors that the agency *can control* compared to what it *can assist* or *can influence*. For example, in situations where the violence is likely to escalate, raising expectations of the disaster affected population about improving their *overall* well-being and later failing to deliver may increase the tension and lead to violent conflict. In this situation, it may be better to choose a more realistic goal such as: *To meet the immediate health needs for the disaster affected population*.

Detailed plan of action

Figure 10-10: The project planning cycle—detailed action plan
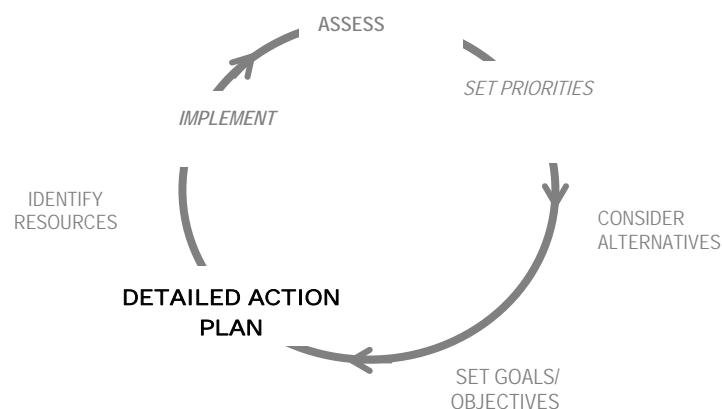
The next step is to define the **detailed action plan.** This defines how the selected interventions will be carried out for the strategies, activities and work schedule. A detailed action plan mainly focuses on the initial response to an emergency. It might have to be revised as the situation evolves. Where possible, plans for preliminary activities to be initiated at the beginning of the project might also be drawn. To ensure that the planned actions timetable is realistic, involve local workers with past experience in this field. Activities that can cause delay should be anticipated and alternative timetables prepared. The plan of action should include suitable indicators and targets for monitoring the implementation progress. If a conflict-sensitive approach is used for setting project goals and objectives, the action plan will also be developed in a conflict-sensitive and transparent fashion. Wherever possible, planned activities must be integrated. Especially sensitive elements in reproductive health including Gender Based Sexual Violence should be integrated. Practically, a plan should have room for contingencies to avoid the whole plan having to be revised if something unforeseen happens. One problem often faced by humanitarian actors is that donors do not fully support the plan and there are not enough resources. A realistic plan should, therefore, have elements to prioritise the most important activities to keep and the ones to be delayed or scrapped.

Identifying strategies, activities, and implementation schedules

Define what, how, by whom, and where

▪ From the priority interventions identified as essential to achieving the project objectives, specify the *actual services* that address the most urgent needs. Consider also what management support is necessary for carrying out the selected interventions;

▪ The next step is to define the *how* the services will be delivered (strategies) e.g. whether the initial response will focus on preventive or curative measures, whether services will be integrated or function independently, be community-based or facility-based. In acute emergencies, the priority is to control the situation quickly regardless of efficiency. Therefore, determine the logical sequence of activities (methods) for each intervention and management support, e.g. vaccinate, manage cases and maintain records. Supportive management services (e.g. training, supervision) should also be broken down into strategies and activities. (Refer to Table 10.11 below).

Table 10-11: Work sheet for identifying services, strategies, and activities

Objective	Services	Strategy	Activities	Who will deliver?	How and where?
Reduce incidence of measles	**Immunisation** Nutrition. Health education. Basic curative care.	**Emphasise prevention:** Provided with basic supplies to new arrivals after screening at settlement entry point.	Community awareness, community mobilisation for immunisation. Establish cold chain. Vaccinate all < 12 years Active case-finding. Manage cases.	PHN at clinic. Vaccinator at entry, clinics. Vaccinator, Community Health Worker (CHW), volunteer. Community Health Doctor.	At health centre, camps, OPD consultation, home-visits, screening.

Management

Objective	Services	Strategy	Activities	Who will deliver?	How and where?
Reduce incidence of diarrhoea	**Community organisation** Water/sanitation Child health care Nutrition	**Emphasise promotion:** Mobilise community to participate in improving the sanitary conditions	Meet community leaders Form health committees Recruit volunteers Train on diarrhoea control Mobilise supplies	Community Organiser, PHN COs, PHN Health committee PHN, volunteers COs, Community Health workers (CHWs), PHN	Visit community, camp Assemble at community level, camp offices Camps, health centres
Reduce incidence of malaria	**Basic curative care** Disease control Health education Nutrition	**Emphasise curative:** Provided regularly at health facility and periodically in community	Create community awareness. Standardise case definition and treatment protocols Identify/refer cases from field Manage cases Maintain drug supply Maintain records	CHD, Pharmacy technician CHWs, volunteers and supervisors CHD, CHN Pharmacy technician CHD, Clerks	Community Health centre Camps At h/centre At health centre

Note: It is only when a relief programme is being implemented that each activity is broken into a series of tasks. For example, to manage cases under basic curative care involves taking history, doing a physical examination and making a diagnosis which will determine whether to admit or refer a patient, prescribe treatment and book a follow-up or simply give a patient some health care advice. Even then, only key tasks should be specified since it might not be practical to standardise every specific task in the face of changing emergency situations and resources.

▪ People who will be responsible for carrying out key activities and tasks should be specified. Recognising that tasks should be assigned to the lowest skilled worker capable of doing the task, let the family and community do whatever promotive and preventive health care they can for themselves. It is also necessary to specify where each activity will be conducted.

Define the timetable for each project

▪ Estimate the duration of each activity. Define the order in which related activities need to be performed (while considering obstacles) and the expected time frame. Afterwards, draw a monthly schedule for each service and an annual one for the entire programme (project time-frame). A Gantt chart can be used to map the time-line of activities as shown in the table below. A Gantt chart can later assist in evaluating the process.

Management

Table 10-12: Gantt chart showing timeline for Oral Rehydration Therapy (ORT) project

Programme activities	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
Recruit volunteers	■	■									
Community Health Worker (CHW)/volunteer training on malaria		■	■								
CHW/volunteer provide health education and Bed nets, and how to use them		■	■	■	■	■	■	■	■	■	
20% mothers motivated to use bed nets for their children under five				■	■						
30% more mothers motivated to use bed nets						■	■	■			
Remaining 40% mothers motivated to use bed nets									■	■	■

▪ Before finalising the project timetable review the findings from the conflict analysis. Think again whether the proposed time frame is practical for all programme activities. Enquiry on upcoming local events may reveal a need for readjusting the time-table. For example, if elections are scheduled during the second quarter, then not all Community Health Workers (CHWs) and volunteers might be available to support malaria control activities. The total number of CHWs and volunteers to be recruited and trained during the first quarter may be doubled to prevent any negative impact of elections to the programme.

Proactive management of constraints

▪ Relief operations are subjected to many negative forces, both from inside and outside the organisation. Therefore, confronting constraints and challenges is inevitable. Internal constraints include new programmes, budget cuts and staff turnover. An example of an external constraint is the increased demands from beneficiaries and donors. Because relief operations involve interaction between different units, constraints in one unit are likely to have an effect on other units within an organisation. Therefore, relief managers need to adopt a proactive and systematic approach to predicting and managing constraints. This approach will address the potential needs and impact of the change on all units that are affected;

▪ Potential constraints within an operation should first be analysed to determine the key issues i.e. whether they are related to the organisational structure, management style, human resources or the system of working. Consulting with all stakeholders will help identify all the possible actions needed. A problem in one area can touch on the other areas. For example, lack of supervisory skills may affect the style of supervision and the system of working. This implies that more than one area might have to be addressed to improve the overall performance of the organisation. For example, training supervisors can be combined with change in organisational structure to assure an effective system of working.

Selecting indicators and targets

Select indicators for monitoring the progress of activities

▪ For each selected intervention to be implemented, identify suitable **indicators** i.e. signals that can show whether results or standards have been achieved. Select indicators for measuring *inputs*, *processes* and *outcomes,* making sure that they are all logically linked. The systems approach (shown in Table 10.13 below) helps managers to remember all the essential information for each proposed service. One can start with the inputs and work forward or from the desired impacts and work backward.

Table 10-13: Defining indicators for Primary Health Care and management services

Input	Process	Output	Outcome	Results
Example: Finances, equipment drugs and supplies Human resources Technical guidelines, recording forms	Example: Training, procurement and supply management	Example: Service delivery, advocacy, community mobilisation	Example: Health coverage behaviour change	Example: Disease burden socio-economic status
Child nutrition				
GM cards, scales, Nutrition monitors, Functioning TFC	weighing, diagnosing PEM, counselling	weight recorded, child referred to TFC, mother counselled on breast feed and nutrition	Mother understands child nutrition, Mother feeds better	weight gain, malnutrition drops
Water supply				
Water monitors, chlorine, pipeline	Transport to taps, disinfect	Quantity and quality of water at household	Water consumed: drinking, hygiene	Decreased illness from diarrhoea and skin diseases
Basic curative care				
CHD, CHN, drugs	patient consulting, diagnosing, counselling	patient diagnosed, counselled on therapy, drugs prescribed and issued as per protocols	patient understands therapy, complies to treatment	patient recovers, decreased death rates
Vectrol control				
Vector control strategies Staff recruitment	Health workers and volunteers trained LLINs and Indoor Residual Spray (IRS) products distributed BCC for ITNs/LLINs and IRS	Households sprayed Under five children and pregnant women with ITNs/LLINs	ITN/LLIN use Population protected by IRS	Decreased malaria incidence Decline in malaria deaths

Support supervision				
Supervisors, checklists	visiting, evaluating, supporting	performance evaluated and worker counselled	Improved skills, increased motivation	Better patient care provided
Community organization				
Community Leaders Red Cross/ Red Crescent branch leaders	visiting	communities visited	active volunteers	Leaders support programme activities

▪ Since it is not feasible to monitor many indicators particularly in the acute phase, select two to three indicators to monitor the progress of each service. The most crucial indicators for monitoring programme implementation are the *inputs*, *outputs* and *outcome* indicators as illustrated below:

  ▪ *Input indicators*—Are available resources adequate to produce services/products? What is the per capita cost of services per beneficiary?

  ▪ *Output indicators*—Are the target groups being provided with the expected services and products?

  ▪ *Outcome indicators*—Are the Primary Health Care services having the desired effect on the target group?

  ▪ Is there an increase in immunisation coverage? Has there been any health improvement?

Table 10-14: Examples of indicators for monitoring programme Implementation

Service	Input indicator	Output indicator	Outcome indicator
Child nutrition	% child care units which lacked nutrition monitors	% mothers counselled on proper child nutrition	% under-fives who are malnourished
Basic Health Care	% health units which had shortage of essential drugs and supplies	% malaria cases treated (as per protocols)	% deaths due to malaria

Context sensitive planners can also select indicators for tracking the profile, causes, actors and dynamics of actual or potential conflict settings using the traditional monitoring process and approach. This will ensure that adjustments can be made when the gathered data suggests a possible negative impact if the interventions proceed as planned. While traditional monitoring processes are often conducted monthly or quarterly, contextual monitoring is more challenging since the time-frame depends on the identified profile, causes and dynamics. For example, contextual monitoring might be ongoing while elections are underway although detailed project monitoring has just been concluded for a particular quarter. This has many financial implications for the project.

In settings with escalating violence, the only possible assistance might be to send some relief food and supplies. Contextual monitoring in this situation can be very difficult. Instead, many international agencies rely on their network of local partners and staff to obtain feedback on the evolving conflict via radio or telephone.

Because every context is unique, there are no standard lists of indicators for contextual monitoring and evaluation. Humanitarian and developmental aid agencies need to develop their own indicators which must include the following:

▪ **Conflict indicators** for measuring the progression of conflict factors against the baseline (e.g. level of insecurity, political instability). They can also help set the targets for contingency planning;

▪ **Interaction indicators** for measuring: i) the impact of the project on the conflict (e.g. improved access to services for minority groups); ii) the impact of conflict factors on the project (e.g. number of project staff approached by corrupt local officials).

Set performance standards and targets;

▪ **Performance standards** describe what an organisation wants to achieve and the tasks or activities necessary to reach the standards. Whether they are in the form of a manual, flowcharts or step-by-step procedures, these standards provide the criteria for measuring performance and for detecting any gaps in service delivery. Performance indicators are often measured in terms of quantity (using numbers or percentages). **Quality** can be assessed by measuring performance of health services according to accepted standards. Other measures of quality include monitoring the service delivery *process* or *availability* of inputs (e.g. drugs, staff). If the standard is to improve quality of care, then an agency needs to define specific quality standards and agree on how to reach that goal. The following are examples of performance standards:

   ▪ **Access**—potable water supply within a walking distance of fifteen minutes;

   ▪ **Utilisation**—prenatal care attendance above 60% of pregnant women;

   ▪ **Quality**—cold chain maintained 100% of the time;

   ▪ **Resource availability**—no stock-outs for the top fifteen essential drugs;

   ▪ **Cost**—drugs consumed are within the fixed budget;

   ▪ **Coverage**—a minimum of 80% of children aged twelve to twenty-three months are fully immunised;

   ▪ **Privacy**—providers maintain privacy during the entire HIV counselling session.

Checklists can be designed that include both qualitative indicators and quantitative indicators to measure the progress against the objectives, as shown in Table 10-15.

*Table 10-15: Some sample indicators for monitoring and evaluating
Oral Re-Hydration Therapy*

Input indicators	Output indicators	Outcome indicators
% health units which experienced stock shortage of Oral Rehydration Solution (ORS) packets*	% health workers and volunteers who counsel mothers on preparation and administer ORS *% health workers and volunteers who correctly showed mothers how to prepare and administer ORS**	% mothers who know how to prepare and administer ORS % mothers who used ORS and continued feeding during their child's last diarrhoea episode
% health units which have received programme guidelines about service quality in the last period	% health workers and volunteers who received refresher training on specific Primary Health Care interventions within the last period *% training sessions given that completed the technical content**	*% health workers and volunteers who showed improvement between the pre- and post-tests during training**

*Quantitative indicators are shown in italics

Once performance standards are defined, they must be applied toward work and used for assessing if the criteria have been met. By setting and communicating performance standards, everyone is clear what the organisation is working toward, and the staff has a clear and achievable target against which to measure progress. Whether the targets or standards are measured against base-line data or international standards, they should be realistic and relevant to all stakeholders. In addition, they may be updated periodically by the concerned staff with the beneficiary community. As recovery from a disaster occurs, standards may change.

To ensure the right to health for the affected population is respected, it is important to sensitise aid workers immediately after their recruitment about the required standards and the universal principles for humanitarian response. The host government and other stakeholders must also work closely to ensure the emergency health programme meets set standards. This will secure the safety and wellbeing of the disaster affected population. Below are important standards to be considered.

- **National standards**—In emergency or post-conflict settings, humanitarian agencies are required to adopt host country standards and guidelines including case definitions, treatment protocols and essential drug lists. The initial assessment can include consulting the ministry of health, another lead agency or the clusters about existing standards and guidelines to confirm that they are up-to-date. Where national standards are either not appropriate or not available, it might be necessary to adopt other standards that are applicable to the emergency and post-conflict settings. WHO and other UN agencies have defined various public health standards for communicable disease control and maternal and child health. This section will focus on two other international standards that address the overall management of humanitarian response;

- **Local standards**—Standards for disaster response can be defined by stakeholders at the affected site. These can include case definitions for new disease outbreaks, new protocols or procedures. These are likely to change as the response evolves. For example, according to the former medical coordinator for the Coastal Refugee Project of the Kenyan Red Cross Society, during the 1990s the Kenyan health authorities and UNHCR adopted a six-month course of anti-TB treatment regimen for all Somali refugees with TB residing in camps rather than the more prolonged regimen (eight to nine months duration) that was administered to all TB patients among the host population.

- **The Minimum Standards of the Sphere Project**—The international humanitarian community, via the Sphere Project, has produced a set of **minimum standards** for humanitarian response within the context of the international human rights laws sustaining the lives and dignity of those affected by conflict or calamity. The minimum standards focus on the core contents of the rights to health, namely that everyone has the right to equal access to health care, safe water; adequate sanitation, an adequate supply of safe food, nutrition and housing, healthy environmental conditions, access to health-related education and information, non-discrimination, human dignity and the affirmation of individual self-worth. Use of the minimum standards can make relief agencies more accountable about what they are doing by providing a yardstick for measuring what an agency should try to achieve. These standards can also be used to monitor and evaluate the service delivery and outcome of projects. The following table summarises the core areas covered by common minimum standards that are applicable to all sectors.

Table 10-16: Summary of the common minimum standards of the Sphere Project[9]

Standards	Description
1. Participation	The disaster-affected population actively participates in the assessment, design, implementation, monitoring and evaluation of the assistance programme.
2. Initial assessment	Assessments provide an understanding of the disaster situation and a clear analysis of threats to life, dignity, health and livelihoods to determine in consultation with the relevant authorities whether an external response is required and, if so, the nature of the response.
3. Response	A humanitarian response is required in situations where the relevant authorities are unable and/or unwilling to respond to the protection and assistance needs of the population on the territory over which they have control, and when assessment and analysis indicate that these needs are unmet.
4. Targeting	Humanitarian assistance or services are provided equitably and impartially, based on the vulnerability and needs of individuals or groups affected by disaster.
5. Monitoring	The effectiveness of the programme in responding to problems is identified and changes in the broader context are continually monitored to improve or phase the programme out as required.
6. Evaluation	There is a systematic and impartial examination of humanitarian action intended to draw lessons to improve practice and policy and to enhance accountability.
7. Aid worker competencies	Aid workers possess appropriate qualifications, attitudes and experience to plan and implement appropriate programmes effectively.
8. Supervision, management and support of personnel	Aid workers receive supervision and support to ensure effective implementation of the humanitarian assistance programme.

Note: Application of the common minimum standards will depend upon the context of each emergency situation. Not every standard will be relevant in every situation.

▪ Code of conduct is a voluntary code promoting a high level of independence, effectiveness and impact in disaster response. It has been developed by the International Federation with support from other international NGOs. Once an agency accepts the code it needs to train its workers to carry out their work according to set standards. The main components of this code and recommendations for host governments, donors and UN agencies are summarised below.

Management

Table 10-17: Summary of the code of conduct

Code of Conduct for NGOs in disaster response programmes

1. The humanitarian imperative comes first;
2. Aid is given regardless of the race, religion, beliefs or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone;
3. Aid will not be used to further a particular political or religious standpoint;
4. We shall endeavour not to act as instruments of government foreign policy;
5. We shall respect culture and custom;
6. We shall attempt to build disaster response on local capacities;
7. Ways shall be found to involve programme beneficiaries in the management of relief aid;
8. Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs;
9. We hold ourselves accountable to both those we seek to assist and those from whom we accept resources;
10. In our information, publicity and advertising activities, we shall recognise disaster victims as dignified humans, not hopeless objects.

Recommendations to the governments of disaster-affected countries

1. Governments should recognise and respect the independent, humanitarian and impartial actions of Non-Governmental Humanitarian Agencies (NGHAs);
2. Host governments should facilitate rapid access to disaster victims for NGHAs;
3. Governments should facilitate the timely flow of relief goods and information during disasters;
4. Governments should seek to provide a coordinated disaster information and planning service;
5. Disaster relief in the event of armed conflict.

Recommendations to donor governments

1. Donor governments should recognise and respect the independent, humanitarian and impartial actions of NGHAs;
2. Donor governments should provide funding with a guarantee of operational independence;
3. Donor governments should use their good offices to assist NGHAs in obtaining access to disaster victims.

Recommendations to InterGovernmental Organisations (IGOs)

1. IGOs should recognise NGHAs, local and foreign as valuable partners;
2. IGOs should assist host governments to provide an overall coordinating framework for international and local disaster relief;
3. IGOs should extend security protection provided for UN organisations to NGHAs;
4. IGOs should provide NGHAs with the same access to relevant information as is granted to UN organisations.

Note: Definitions for terms used in the above table:

NGOs: Non-Governmental Organisations refers here to organisations, both national and international, as well as faith-based agencies which are constituted separately from the government of the country in which they are founded.

NGHAs: the term Non-Governmental Humanitarian Agencies (NGHAs) refers to the components of the **International Red Cross and Red Crescent Movement**—*The International Committee of the Red Cross, The International Federation of Red Cross and Red Crescent Societies and its member National Societies*—and the NGOs as defined

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above. This code refers specifically to those NGHAs who are involved in disaster response.

IGOs: Inter-Governmental Organisations refers to organisations constituted by two or more governments. It thus includes all United Nations Agencies and regional organisations.

Disasters: A disaster is a calamitous event resulting in the loss of life, great human suffering and distress and large-scale material damage.

- **Humanitarian accountability partnership standard 2007** has been recently developed in consultation with numerous international agencies (including CARE, Concern, OXFAM, SCF-UK) to address the most critical issues regarding the quality of humanitarian action as perceived from the perspective of its intended beneficiaries and other key stakeholders This standard can be considered as a simplified 'ISO 9000' (quality management) standard for humanitarian action.[7] It comprises of six key benchmarks as summarised in the table below.

Table 10-18: Humanitarian accountability partnership 2007 Benchmarks

The agency shall establish a humanitarian quality management system.
The agency shall make the following information publicly available to intended beneficiaries, disaster-affected communities, agency staff and other specified stakeholders: ▪ Organisational background; ▪ Humanitarian accountability framework; ▪ Humanitarian plan; ▪ Progress reports; and ▪ Complaints handling procedures.
The agency shall enable beneficiaries and their representatives to participate in programme decisions and seek their informed consent.
The agency shall determine the competencies, attitudes and development needs of staff required to implement its humanitarian quality management system.
The agency shall establish and implement complaints-handling procedures that are effective, accessible and safe for intended beneficiaries, disaster-affected communities, agency staff, humanitarian partners and other specified bodies.
The agency shall establish a process of continual improvement for its humanitarian accountability framework and humanitarian quality management system.

Identifying resources needed

Humanitarian ethics dictate that during acute emergencies immediate assistance should be given at any cost to minimise the suffering of victims even if it involves shipping in large consignments of food, emergency health kits, water trucks or shelter material. Unfortunately, appeals for humanitarian assistance typically result in tons of unnecessary donations, which consume valuable storage space, manpower and time to sort. To ensure assistance is more efficient, the implementing agencies must first specify what resources are needed (e.g. personnel, commodities, equipment, drugs and transport). Estimates should be based on the assessment findings and proposed action plan. Otherwise major shortages could greatly interfere with the relief operation. After defining emergency resource needs, a reasonable budget must be drawn for each project and for a specified time period. The budget should be based on information about the local availability of the required resources (their cost, quantity, quality etc.). More resources should be focused on the community and health centre level care (see the health services and infrastructure chapter for details). The following rules may be considered when identifying and procuring resources:

- Must involve the affected population in order to build capacity;

- Should strengthen capacity rather than cripple the existing services;

- Prolonged external support should increase sustainability rather than dependency;

- Must be compatible with local customs;

- Must conform to local protocols and methods;

- Select drugs and commodities which can be rapidly mobilised and easily stored or distributed;

- Must not destroy local market economics by lowering prices of locally produced goods.

Resources commonly required for humanitarians assistance may be classified as follows:

- *Basic supplies*—expected consumption, what type, how much, buffer stock for losses or contingencies like sudden population influxes;

- *Equipment*—what type is normally used in the country, including IT and telecommunications, how to mobilise and maintain, clearance costs and possible duty charges;

- *Staffing*—specify who, how many, local recruitment possible, for how long including training needs and staff health care;

- *Other*—specify what else such as storage space, transport options, customs requirements, communication facilitation, psychosocial support, legal advice or financial aid.

Below is a summary of resources that are likely to be procured for emergency response:

Table 10-19: Essential resources for an emergency health care programme

Staffing		Basic supplies	
PHC co-ordinator	Health co-ordinator	Food structures	Shelter/Service
Field coordinator	Administrator	Water supply	Shelter material
Field managers	Public health nurse	Sanitation	Household items
Finance staff	MCH staff	Drugs/medical supplies	Clothing
Logistics staff	Nutrition staff	Telecommunications	
Guards/messengers	Health educators		
Cleaners	Water/Sanitation staff		
Drivers, mechanics	Health assistants		
Construction workers	Cleaners		
Medical assistants	Trainers of volunteers		

The following steps may be used to estimate the resources for the proposed actions:

Determine basic supplies by estimating basic needs for the displaced persons according to internationally approved standards. The Minimum Standards of the Sphere Project identifies the following requirements:

- There should be access to sufficient amount of water for drinking, cooking and bathing (at least 15 l/person/day). Additional supplies might be necessary if there are large numbers of domestic animals;

- A steady and adequate supply of sufficient quality food to sustain life (an average 2,100 kcal/person/day);

- Safe access to sufficient number of clean functioning latrines (one latrine per twenty persons or family);

- Each person has access to 250 g of soap per month;

- Interagency Emergency Health Kits (IEHK) (one IEHK for 10,000 populations for three months) are used initially, but later drug needs are purchased or ordered;

- The Minimum Initial Service Package is used initially for people's reproductive health needs;

- Sufficient protection from the climate (appropriate shelter material and sufficient blankets per family);

- At least one full set of clothing (that is appropriate to the culture and climate) per person and a regular supply of sanitary protection for women and girls;

- People have appropriate household items (one cooking pot with lid, one basin, one kitchen knife, two wooden spoons, two water collection and water storage vessels per family, one plate, one metal spoon, one mug per person);

- Particular attention is paid to the provision of cooking fuel, and the control and management of natural resources in the area around the camp;

- People have appropriate tools and materials (such as farming tools and seeds) to support livelihood activity as soon as possible.

Identify the equipment required—Determine the equipment required for key activities such as cold chain maintenance, provision of safe water including well drilling, vector control, laboratory, transportation, telecommunication etc. If possible, procure locally so that it includes maintenance coverage and repairs. Identify where to find it. Often things are found in the local market, but it takes a long time to get and the quantities required are often not found with one single supplier.

Define staffing requirements*:* The affected population should play a central roll in delivering services. Outsiders can be limited by language barriers and unfamiliarity with the local culture. The following steps can be used to estimate staffing requirements:

- After specifying *who* will deliver services, determine *how many* workers are needed for each service. The number will vary according to the level of the primary health care system. The minimum staff to deliver the services should be recruited to initiate the project. The number can gradually grow according to needs. Plans for supervision must be in place from the beginning. The table below defines the minimum standards for staffing in health services:

Table 10-20: Health services staffing based

- Home visitor/CHW   1 per 500-1000 people (at least 50% should be female)
- Traditional birth attendant: 1 per 2,000 population
- Supervisor: 1 per 10 home visitors, 1 senior supervisor
- Qualified health worker: 1 per 10,000 population (based on 1 person per 50 consultations/ day)
- Health worker: 1 per 20-30 beds (8 hour shifts)
- Doctor: 1 per 50,000 population
- Clinical officer   1 per 50 consultations
- Locally-trained health worker: 1-2 for pharmacy, 1 for ORT, 1-2 for dressing/injection/sterilisation
- Non-medical staff: 1-2 clerks, 1-3 guards (8 hour shifts), cleaners

- It is not enough to base the number of personnel required only on the recommended health worker norms, but also according to the work force's level of competence. To ensure the most productive use of people, the following must be specified when new staff are recruited:

  - Who will do what?
  - Who will be responsible?
  - Who will report to whom?

- Drawing an **organisational chart** and individual **job descriptions** might help answer the above questions. Organisational charts define **reporting lines** while job descriptions select the right staff and prevent future problems of excess staffing or poor performance. For each staff position, very short job descriptions can be drawn (one or two sentences summarising the main responsibilities). The organisational chart and job descriptions often need revision during the course of the relief project because of changes in the emergency situation, in staffing or programme funding;

- To determine *how much work time* will be required for specific activities, basic **work plans** (or timetables) can be developed as shown below. They guide how the work will be carried out. In the acute emergency phase, the work might be more demanding and will sometimes demand hours from dawn to dusk. During this phase, staff can work in two shifts or even three to avoid burn-out. Including supervision within the work plans will ensure that workers receive help when they need and maintain a high standard of service delivery.

Table 10-21: Example of a community health nurse weekly work plan

Task	CHN weekly workplan					
	Mon	Tue	Wed	Thu	Fri	Sat
High-risk visits	6-7	6-8		6-7		
Child care clinic			8-12		8-12	
Health education	8-9			8-9		
ANC	9-12				2-5	
Immunisation				10-12		
Supervision		2-5				

Community meetings	3-5					10-11 (monthly)
PHC meeting			1-2			
Continuing education			3-5			
Reports	ANC	MCH	EPI	CHW		

- Because of the wide range of backgrounds and skills among the staff and to prevent wasting resources, task descriptions or **job aids** can instruct workers how to perform a task in a standard (and efficient) way. Different job aids can be developed for various categories of health workers. They may can from simple pictures and instructions for community outreach workers to decision-making flow charts and checklists for qualified health workers. Many job aids e.g. the WHO-UNICEF Integrated Management of Child Health (IMCI) guidelines which standardise the clinical management of common childhood illnesses have been developed and are available from the local ministry of health, WHO and other organisations. Not only improving the quality of care, job aids also help supervising staff achieve the desired outcomes from programme interventions;

- Determine the available work force's training gaps by comparing their current skills to the desired level of skills i.e., those skills that would enable them to carry out their assigned tasks according to set standards. Plan for training according to the identified training gaps, and arrange for in-service and on-the-job training to be provided by more experienced staff. Up to 50% of experienced staff's time should be spent on staff training and supervision. For more details on management of staff, refer to the human resource management chapter;

- Use of volunteers without previous medical training is often essential for filling certain service gaps. There is also a lack of trained health care staff and volunteers who have the required health care education. Identify tasks and train people for them (e.g. HIT, which does an enormous amount of work in the communities preventing people from falling sick, thus reducing the workload at the clinics.

Putting the budget together—A budget is a financial management tool that shows how much money is needed to carry out a relief project, how resources are distributed and used. It can be used to evaluate how well resources were distributed and used to achieve the project objectives. The following steps can be used to draw the budget:

- Budgeting for the relief programme should be based on the planned range of activities, the level of care and the best available population estimates. The following table shows a hypothetical population profile that may be used to estimate the resources for a relief programme for a disaster affected population of 20,000.

Table 10-22: Hypothetical population for estimating resources

Target group	% Total population	Estimated size
Total population	100	20,000
Infants	4	800
Children 0-4 years	20	4,000
Children 0-14 years	40	8,000
Women 15-44 years	30	4,000
Elderly	10	2,000

First specify the minimum resources required for individual projects and look at all the resources needed for the entire programme. Since many projects involve similar inputs (personnel or supplies), look for possibilities for programme integration and how resources could be distributed efficiently, to ensure optimal level of care for vulnerable groups. Requests should be made for essential staff, supplies, equipment that cannot be obtained locally.

Planners should budget for resources according to the health needs and available funding. They should keep track of the cash limits for each project or items, e.g. vaccination or salaries or 'in-kind' contributions (drugs, food, personnel, equipment etc.).

The final budget may be prepared as a line budget or programme budget (allowing for inflation, contingency plans and costs of running and evaluating the project). Agency and donor preferences and local practices should be respected when drawing the final budget. An outline and the advantages of each type of budget are shown in Table 10-23

Table 10-23: Outline and advantages of a line budget and a programme budget

Outline of line item budget				Advantages
	Cost (local currency)	Donor 1	Donor 2	▪ Easy to visualise costs. ▪ Simpler to work out. ▪ Good for small projects with few activities.
Donor Personnel - Qualified - Non-qualified Capital Expenses - Office - Vehicles - Laboratory Recurrent costs - Drugs - Vaccines - Stationery - Travel				
	Cost (local currency)	Donor 1	Donor 2	▪ Breaks down cost per activity. ▪ Good for multiple interventions. ▪ Essential if funding may change during project. ▪ Allows cost-analysis of multiple interventions.
Donor Personnel - Qualified - Non-qualified Capital Expenses - Office - Vehicles - Laboratory Recurrent costs - Drugs - Vaccines - Stationery - Travel **Total cost**				

Mobilising resources*:* Approaching donors and other groups for financial, material and other assistance takes time and effort. Many of the required resources may be available locally e.g. manpower, construction materials, and technical assistance. Community leaders, local politicians may become interested after sharing with them a credible vision

of a successful response. They may even advocate with external development partners by signing letters of support. Some donors may successfully be reached through the internet.

Developing an exit strategy—Humanitarian or developmental aid for emergency and post-conflict situations eventually come to an end sometimes after more than a decade. Exit strategies should be planned early, declaring to what extent they intend to fill the gaps caused by the disaster only or to cover needs during recovery, rehabilitation and development. It is important to prepare the local authorities, government, all beneficiaries and project staff for this eventuality to allay false expectations. There are three possible ways of concluding a project:

- Terminating a project;
- Developing a follow-up project with a new phase;
- Expanding an existing project.

Ongoing assessment of the humanitarian context will guide managers to choose an appropriate exit strategy. Agencies need to recognise that a different exit strategy might be more appropriate as the completion of a project approaches e.g. based on the changing dynamics of the conflict. Sustainable or durable solutions for the affected population are key issues for projects that must be phased out. When there is a conflict, aid workers need a more conflict sensitive approach in their day-to-day interactions with the project beneficiaries. In mid-1995, a Somali refugee attending outpatient services at a health centre was so frustrated by the fact that Utange refugee camp in Mombasa, Kenya, was being closed that when he was informed that his prescription medicines were out of stock he struck the concerned health worker on the head. Another Somali refugee poured paraffin on his body and set himself ablaze in front of UN local staff just after learning that he was not eligible for resettlement in America.

Designing a well-planned exit strategy for projects that might expand or have a follow-up phase will provide a strong foundation for follow-on recovery, rehabilitation or development activities. As well as identifying and building on the successes of the original project, it is important to document where things did not go as planned in order to avoid these situations.

Sometimes projects have to close abruptly when donor support is flagging or when the security situation deteriorates rapidly. If no contingency plan exists, all expatriate staff must leave quickly often leaving the beneficiaries and local staff without any support. Humanitarian and developmental agencies must be prepared for the unexpected by addressing the following questions:

- If the conflict situation deteriorates completely, what actions are necessary?
- How will they be carried out?
- Who will undertake them?
- In what time frame?

Having a contingency plan that is shared with all staff, volunteers and representatives of the victims ensures continued support for the beneficiaries for some time even though circumstances may be rather difficult. In addition, a certain level of safety would be assured for local staff that may have nowhere to flee.

Writing a project proposal

After a rapid assessment and follow up, in-depth assessments confirm that external support is needed to support an emergency or post-conflict response, humanitarian or developmental agencies develop a project proposal that draws on key findings. This will be presented to potential donors and the host government to convince them to respond to the disaster situation and how the proposed project can address the identified problems. The proposal can later provide the basis for detailed project planning and for evaluation of the project.

When writing a proposal, it is important to do the following:

▪ Be brief, but include all the important details about the project (project justification, goals and objectives, general outline of strategy, activities, and time-frame, indicators for monitoring and evaluation, budget);

▪ Be supported by facts and estimates from the assessment report and other reliable sources;

▪ Clarify what the government, other agencies and local authorities are doing and, if possible, what their plans are;

▪ Name all sources of funding and other contributions your organisation has received and what has been pledged;

▪ Clarify if the emergency phase is intended to be covered alone or if the project proposal bridges into recovery, rehabilitation and development—and how;

▪ Where necessary, discuss the future sustainability of the project;

▪ Ensure that your proposal considers contingency and capacity building amongst the beneficiaries and local authorities involved in the operation.

Use pre-designed formats for project proposals with care. They can serve as useful checklists of all the issues that should be considered, but should not be taken as a 'form-filling exercise.' The forms should be adjusted to the particular situation or culture of the project.

The following table defines twelve reasons why proposals are rejected and suggests corrective measures.

Table 10-24: Common problems with proposals

Stated reason for rejected proposal	Suggested corrective action
The proposal is poorly written and difficult to understand.	Ask friends and experienced colleagues critique the proposal
The proposal does not follow prescribed format.	Read the application information carefully and make sure you follow it.
The problem and needs statement is not clearly stated, goals and objectives are not clear.	Be sure you're presenting a sound proposal.
The proposed budget and grant request is not within the donor's funding range.	Research previous donor allocations to other agencies and request an average amount of funding from the donor.
The donor does not know the applicants – are they credible?	Set up an interview with the potential donor before sending the proposal to discuss your credibility with other donors.
The organisation does not meet donor priorities.	Research donor priorities before applying.
The organisation is not located in the donor's geographic area of funding.	Check the guidelines and/or grants guide before applying
The proposal does not seem urgent and might not have much impact.	Request a skilled writer to make it grab the donor's attention.
There is insufficient evidence that the programme will be sustainable after the grant is completed.	Add a special section about the long-term plans for self-sufficiency.
The objectives and plan of action greatly exceed the budget and timelines for implementation.	Be realistic about the programme and budgets and only promise what can be delivered.
The donor(s) have already allocated all the funding for this grant cycle.	This is a fact of life. Be better prepared in the next available funding cycle.
The donor(s) have already allocated funds for the same activities to another organisation.	Coordinate during your planning.

All these previous steps can define priorities, goals and objectives, implementation plans and budgets for a project proposal addressing emergency and post-conflict situations.

Table 10-25: Worksheet example for estimating resources for a relief programme (for 20,000 persons for one year)

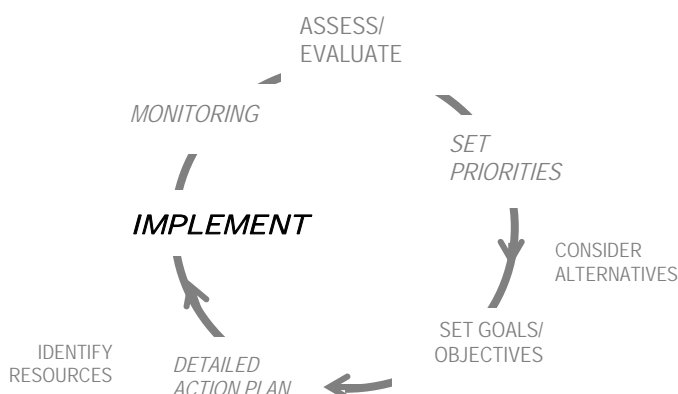| INTERVENTION			PERSONNEL			LOGISTICS			FINANCES	
			Required		Avail	Required		Avail.		
Service or Activity	Target Group	Frequency	Type	No.	No.	Type	Amount .	No.	Cost	Source
Community-based Health Care										
Reproductive Health: Safe motherhood	600 pregnant women (CBR~30/1000/yr)	50 ANC visits/month	TBA @ 30 deliveries/mo	2		TBA kits	30	10		UNICEF
CHW/volunteer Home Visits: IEC (GM/ORS/EPI/ANC/FP), follow-up high-risk. referral, collect data etc.)	3,500 households (@ 6 persons/house-hold)	1visit/house-hold/month High-risk 1/week or more PRN	CHW @ 30 persons per day	20	4	Weighing scale, ORS packs, registers, stationery	10 20,000 5	5 5,000 10		IFRC
Community organisation: H/Ed, dialogue, feedback	All mothers in 5 camps	1 camp meeting /mo	CHW CHN CHD	2.5 1 0.4		Flip charts	5			ONS
Outreach										
Vaccination	All children < 5 & pregnant women in 5 camps	1 visit / camp/week	Vaccinator	1		Vaccines, carrier, syringes, van	10 days/month			UNICEF
Supervision	All CHWs, TBAs, Vaccinators	3 visits/camp/month	CHN @ 1 per 10 workers	3		Van	15 days/month			MoH
Centre-based										
Curative care (includes vaccination)	All 20,000 IDPs @ 4 consult /person/yr	200 patients/day (20% refer. To CHD)	CHN, CHD CHW Vaccinator	3 1 5 0.8		Drugs, equipment, van	2 days/month			MoH MoH IFRC UNICEF
Management activities (meetings, reports, training)	Health care team, CHN, CHD	1/mo 1/mo	CHD CHN CHW Vaccinator	0.6 1 2.5 0.2		Stationery (registers, forms)				IFRC
Administration			Admin. clerk Junior staff Security	2 3 2		IT, Telecommunications, transport, housing, stationery, cleaning supplies etc.	2 days/month			ONS
TOTAL			Vaccinator CHN CHW CHD TBA Admin. clerk Junior staff Security	2 8 30 2 2 2 3 2	1 1 8 1 10 @ 20% 1 1 1	Van, cost of other equipment	1			

ANC – antenatal care
GM – growth monitoring
EPI – expanded programme on immunisation
FP – family planning
IEC – information, education, communication
H/ED – health education

CHN – community health nurse
CHD – community health doctor
TBA – traditional birth attendant

ONS – Operating National Society
MoH – Ministry of Health
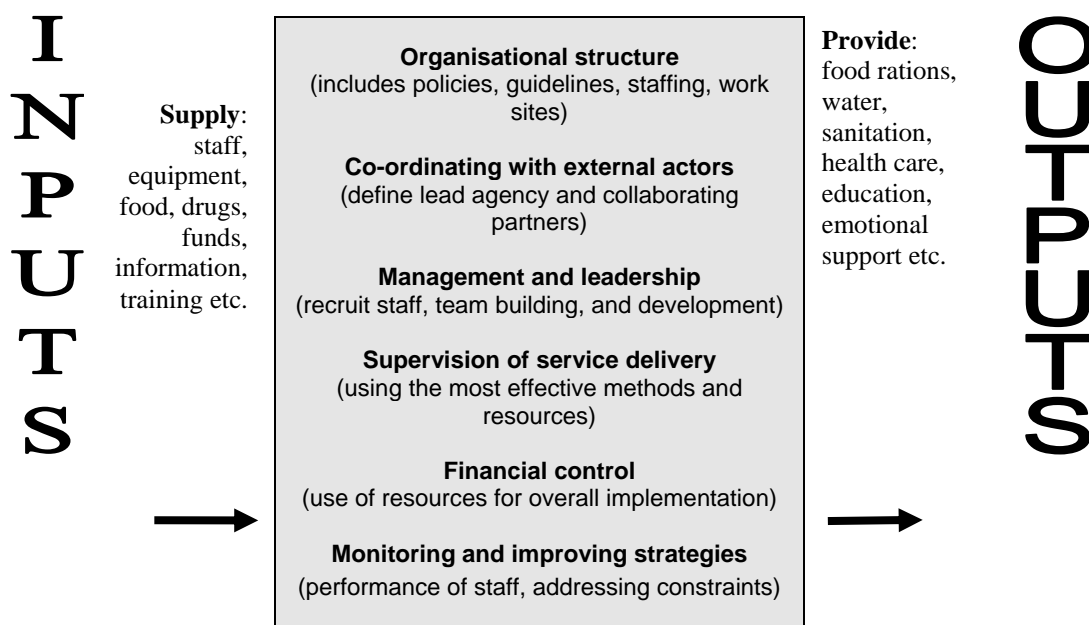IFRC – International Federation RC/RC Societies

Implementing relief projects

Figure 10-11: The project planning cycle—implement

ASSESS/
EVALUATE

MONITORING

*SET
PRIORITIES*

IMPLEMENT

CONSIDER
ALTERNATIVES

IDENTIFY
RESOURCES

*DETAILED
ACTION PLAN*

SET GOALS/
OBJECTIVES

Project implementation transforms inputs through a set of systems and procedures to produce planned outputs. Some agencies might only apply good management practices when planning the relief project but not during implementation due to overwhelming workload and priorities of an emergency or post-conflict situation. Even in these settings however, adopting the common sense management approach ensures a healthier working environment with optimal use of resources. The remainder of the chapter describes the practical approach for setting up a relief project within a coordinated humanitarian framework, building staff capacity and management skills, establishing an information system and finally carrying out project monitoring and evaluation. The implementation process with corresponding inputs and outputs is summarised in the figure below.

Figure 10-12: The process of implementing a relief project

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Supply:
staff,
equipment,
food, drugs,
funds,
information,
training etc.

Organisational structure
(includes policies, guidelines, staffing, work sites)

Co-ordinating with external actors
(define lead agency and collaborating partners)

Management and leadership
(recruit staff, team building, and development)

Supervision of service delivery
(using the most effective methods and resources)

Financial control
(use of resources for overall implementation)

Monitoring and improving strategies
(performance of staff, addressing constraints)

Provide:
food rations,
water,
sanitation,
health care,
education,
emotional
support etc.

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Management

Getting started

Disaster response often comprises of three distinct stages:

- The immediate aftermath of the emergency usually the first twenty-four to forty-eight hours;
- The more prolonged emergency phase (up to three months); and
- The post-emergency phase which may continue indefinitely.

Agencies have different mandates about when they should respond. Some agencies focus only on conflict situations whereas others respond primarily to acute emergencies following natural disasters and depart once the emergency situation has stabilised. Others NGOs can support the transition from relief to development and a few agencies might be interested in all three stages. At whatever stage an agency intervenes, it must first introduce itself to the relevant authorities, define its mission and general policies as well as set up a work site for service delivery.

Starting an emergency operation takes time. After arriving at a disaster scene, the first priority of an agency might include registering with government authorities, identifying appropriate premises, suitable staff and some accommodation arrangements.

- **Registration** for an NGO can be influenced by various factors such as the nature of the emergency, the humanitarian agencies past performance in the disaster location and the local government's. In the early phase of an emergency operation, governments often temporarily waiver normal procedures and procedures which quickly changes. Health delegates, therefore, should bring copies of their registration in the home country, their graduation certificates (basic and specialisation), CV or résumé, and letter of good standing issued by the competent authority in the country where they practice. Even if the bureaucracy is lengthy, it is important to work within the a country's legal framework. This provides an opportunity to pursue work permits for expatriate staff and taxation waivers for relief consignments as well as information sharing and reporting requirements once a project is underway.

- **Office set up** where office premises are not readily available means temporarily moving in with other partners. This can allow new aid workers to become immediately functional with some staff undertaking the needs assessment and the immediate emergency response, while others focus on the organisational structure. Various issues need to be considered when identifying office premises including the anticipated workforce, security, access to public transportation, to telecommunications and the Internet, housing, cost, availability and safety (i.e. structurally sound building and little risk of hazards e.g. floods). As a humanitarian project expands, other satellite offices will be established closer to the operational sites.

- **Organisational policies and guidelines** are for humanitarian organisations hiring local and expatriate staff. Addressing the professional and personal needs of both staff pools greatly reduces humanitarian agencies' high staff turnover. Working in disaster situations also exposes workers to security incidents, high stress, health risks and insufficient support from headquarters. Human resource policies must be designed with these special challenges in mind including a high degree of coordination with operational partners.

- **Medical legal framework** requires that the organisation must be registered appropriately. All expatriate health staff must submit all their credentials for temporary registration. In the early emergency phase this is often waived, but is later reinforced. It is important, especially in field hospitals, that the ministry of health assigns as soon as possible a health professional to assume the overall legal responsibility for the health services provided by the hospital. This is essential for signing birth certificates, death certificates and for dealing with police and insurance cases. The treatment protocols also might be different in the disaster country and should be followed despite many local doctors and general practitioners who might not follow them preferring the latest fashionable and expensive drugs. This often

causes disputes between the expatriate and local doctors working at the health facility.

▪ **Coordination with external organisations and agencies** must be complementary with other implementing partner's service packages despite the service that an agency wishes to implement. The size and type of package selected by an agency may be influenced by the outstanding needs, the organisational capacity and the available resources e.g. for construction, staff recruitment and supervision. Humanitarian assistance must be delivered within a coordinated framework that includes multiple partner's government ministries, UN and other concerned agencies.

Good coordination will result in:

▪ Appropriate division of responsibilities;

▪ Addressing high priority issues and geographical areas;

▪ Elimination of gaps and overlap in services;

▪ Uniform treatment and standards of protection and services for all beneficiaries;

▪ Maximum impact for a given level of resources.

Below are three essential components for establishing a good coordinating mechanism:

▪ **Emergency response framework** help emergency operations to be carried out within a strategic operational framework. Coordination and cooperation between operational partners; the government, UN, the International Federation and its National Societies, faith based organisations and the clusters are of utmost importance for all stakeholders to have effective, fast and competent delivery of the aid. A policy document or strategy can be developed to identify which lead authority is in charge and divide some of the responsibility among key stakeholders. Concerned agencies and community representatives must be consulted during the policy document's development. As well as defining the emergency health priorities and the objectives and framework for achieving them, the document must emphasise that all agencies strengthen and support the local health systems and that all interventions must be coordinated and complementary.

▪ **Lead agencies** in emergencies and immediate post-conflict situations is usually a single lead authority, normally the ministry of health or an emergency cell in the government. Where a host government does not exist or has weak capacity, the UN agency (UNHCR or UNICEF) often takes the lead with the host country's authorities. WHO provides technical support if the host government and the respective UN agency lacks the capacity at a local level.

▪ **Coordination meetings** that are regularly held allow stakeholders to network and cultivate healthy partnerships, to share critical information, identify and monitor priorities and to divide tasks and responsibilities to tackle the many hidden costs on time and other resources. These meetings can be used for strategic planning as well as for reviewing and updating standard protocols and interventions. To be productive, meetings must clearly define objectives and agenda and circulate them to all participants in advance. The duration of meetings and discussions must be well-controlled. Someone must be appointed to record and distribute the minutes of the discussion. Coordination meetings should be held weekly but less frequently as the emergency situation subsides. Most government ministries and departments, UN agencies and all NGOs are represented in the coordinating body. For large scale emergencies with many actors, sector committees can be set up to coordinate implementation in that sector. These committees are responsible for developing common standards in service delivery. This is very important where several agencies are providing similar assistance.

Case study: Afghanistan

Coordination in a post-conflict situation[16]

In Afghanistan after the fall of the Taliban in 2001, international agencies faced a relatively new situation—an emergency-affected country with a new host government that lacked resources and technical expertise. From the beginning, the government was determined to coordinate all major interventions and attract donor funds directly. UN agencies assumed a capacity-building role by working closely with the government and reduced their direct project implementation role. Similarly, NGOs tried to implement programmes according to government policies and standards in geographical areas determined by the government.

Human resources

Human resources in relief operations usually comprise of local staff (all members recruited from within the host country) and delegates (often expatriate staff recruited from outside the country) who may work on contract or as volunteers.

Local staff mostly relief workers are recruited from the beneficiary or host population. Although local professional and para-professional staff might be available, they do not have enough experience or skills to run a relief operation with special emergency projects for displaced populations e.g. search and rescue activities, selective feeding programmes, prevention of sexual and gender violence etc. Some professionals from the displaced population might be considered as 'enemies' during the conflict and be killed. The professionals and para-professionals that survive (doctors, nurses, social workers, psychiatrists etc.) and are available for recruitment might lack recognition or certification as a professional by the host country.

Delegates for relief organisations have to recruit international professionals where the displaced or host population lacks professionals to set up or deliver essential services (medical, mental health, social service centres etc.). However, expatriate staff might be unfamiliar with the host countries and displaced population's culture and keeping them over the long-term might not be cost-effective. Many expatriates have extensive experience and bring new skills from other emergency situations. They serve as programme monitors or neutral parties during relief distribution to displaced people, particularly where there is conflict. The presence of expatriate staff might sometimes be the only guarantee that food and medical supplies will actually be provided. Sometimes, their presence makes high-ranking government officials more co-operative supporting the local staff. When the expatriate staff leave, therefore, critical supplies might cease to arrive or it might be more difficult to get any assistance from the authorities.

Volunteers and voluntary service are a natural part of life in developing countries. Helping others in situations of distress or emergencies requires no particular motivation because it comes from belonging to a family or community. Although an organisation might recruit and pay a lot of staff members, volunteers are the backbone of a relief operation. Volunteers include Community Health Workers, representatives of the beneficiary population like International Federation trained community health volunteers from the host, the displaced, NGOs or from local populations and groups. Volunteers' huge advantage is knowing the culture, traditions, language and knowing how to provide basic health care beyond the peripheral clinics. They volunteers offer voluntary service for various reasons, for example:

- Serving others in the community during emergencies and in long-term development programmes;
- Receiving training focused on prevention and basic care (e.g. oral rehydration therapy). In emergencies, they can be trained in a staggered manner to provide additional skills and responsibilities in weekly training sessions;

- Doing challenging work;
- Becoming involved in International Federation activities, working with the International Federation's seven principles—Humanity, Impartiality, Neutrality, Independence, Voluntary Service, Unity, Universality.

Staff recruitment and capacity building

Humanitarian assistance provides services from people to other people. To succeed, agencies rely heavily on maintaining good relationships with all stakeholders. Human resources are the most valuable asset of relief operations. Since disaster response is urgent, humanitarian organisations have no alternative but to hire the staff that are available although many might be inexperienced. To ensure the response is appropriate, set up management systems that address this reality.

Humanitarian agencies might initially offer daily work or very short-term contracts (e.g. three months) when recruiting staff for emergency or post-conflict situations. Labour laws might differ in various countries, but contracts beyond six months often commit the employer to various issues (pensions, insurance, holidays etc) and have other implications that must be carefully looked into. Future extension is also conditional upon confirming that the staff or volunteers are competent, particularly those that interact closely with disaster affected persons. This approach might not be appropriate where skilled human resources are scarce. Humanitarian agencies often poach skilled staff from the host country, offering much better conditions. In fact, there is a lot of competition between agencies overbidding each other with higher salaries and fringe benefits. At the same time, the host country's health care system is further incapacitated by this behaviour.

The following Sphere Standards should be considered when recruiting aid workers and planning for training:

Table 10-26: Minimum standards for staffing[18]

- Aid workers have relevant technical qualifications and/or previous emergency experience (certificates etc.);
- All staff have knowledge of local cultures and customs;
- Workers are also familiar with human rights and humanitarian principles;
- Staff know about the potential tensions and sources of conflict within the disaster-affected population itself and with host communities;
- They are aware of the implications of delivering humanitarian assistance and pay particular attention to vulnerable groups (e.g. women and children);
- Staff are able to recognise abusive, discriminatory or illegal activities and themselves refrain from such activities.

All newly hired aid workers need a warm welcome, good orientation of the relief operation and a good working environment. It is important to compare and adjust their expectations with the expectations of the hiring manager or agency. Job descriptions must be provided that define in *a general way* their responsibilities, relationship to other workers and the jobs' expected *achievements*. Because job descriptions do not provide enough detail about performing specific tasks, new recruits benefit from additional guidance and on-the-job training from the manager and other team members. Supervision and periodic evaluation of performance should be carried out to identify further training needs as well as consider promotion or other incentives and at the end of the contract, provide a certificate outlining the employment period, tasks and achievements. This often provides a basis for future job opportunities if well written.

Table 10-27: Responsibilities of a medical assistant

Administrative duties	Patient care
▪ Maintain smooth-running of health centre; ▪ Co-ordinate health centre with community activities; ▪ Ensure that existing case definitions and treatment protocols are followed; ▪ Ensure regular medical and other supply; ▪ Supervise team of health workers; ▪ Facilitate collaboration with other sectors; ▪ Convene health committee meetings; ▪ Manage basic health information system ▪ Monthly reports (for ministry of health, UNHCR)	▪ Preventive care: screening for TB; ▪ Primitive: counsel on child care, nutrition, hygiene; ▪ Curative: diagnosis, treatment, referral and follow-up of ill patients.

As soon as humanitarian projects are underway or there is a demand for new interventions, managers must prepare unskilled frontline workers, volunteers and supervisors to assume new responsibilities. The majority will be local staff and volunteers who might be supported by expatriate aid workers. Because the latter do not remain forever at project sites, international NGOs have a limited role to play in disaster response and recovery. A long-term approach will build up and sustain human resource capacity after the projects have closed. This means that NGOs must facilitate and actively contribute to the local capacity-building process to enhance the ability of communities to take decisions rather than totally excluding them in project planning. The approach should be designed as 'help to self-help' in the community with minimal external support but still well linked with the peripheral health care system.

It is important to recognise that training might not always be appropriate, it might not solve all performance problems and it cannot compensate for unsuitable and unwilling staff to carry out their work as expected. Also, training cannot make up for poor supervision. The following table illustrates some guiding principles for addressing critical training issues.

Table10-28: Guiding principles for training[12]

Issues	Guiding principles
Who to train?	▪ A *cascade* strategy is a cost-effective approach to training. First, train the trainers and gradually cascade down to senior leadership, supervisors and frontline workers; ▪ To meet the learning needs of all staff for the purpose of organisational development, they all can be trained together according to their function, level or service delivery point.
How to select trainees?	▪ Trainees might be selected according to their roles and functions in the organisation and the issues that a course is specifically addressing. This might be limited to staff from specialised units e.g. laboratory; ▪ When there are common training needs, mixing staff from different functions or levels within an organisation promotes team-building, cross-fertilisation of ideas, and enhances the work environment.

Issues	Guiding principles
Who should train?	▪ Those closest to an organisation and have the appropriate training skills are best for designing and carrying out training. Expatriate facilitators and external local facilitators might be needed to develop local trainers and provide short-term backstopping.
Where do the training?	▪ If the training aims to effect major change in staff performance and attitude through an intensive or prolonged course (e.g. two to four weeks), then off-site training might be preferable; ▪ Skills-based training of very short-duration (e.g. three days) may be conducted on-site.
What materials to use for training?	▪ Training materials should include open-ended problem-solving exercises that will allow groups to explore organisational values and challenges.
What should the training objectives be?	▪ Objectives must be realistic otherwise support for training will diminish if there are no visible results: for example, a single training event might not be sufficient for developing effective supervision skills but might be adequate for updating frontline workers on new anti-malarial treatment protocols; ▪ Training is only one element for building organisational capacity.
When to conduct training?	▪ Planning and implementing many short half-day courses is easier in a disaster, but might disrupt service delivery; ▪ Training of longer duration is more difficult to sustain, but allows participants to deliberate on how to apply training content to a work setting; ▪ Refresher training might be required regularly and sometimes the initial training will have to be repeated.
How to evaluate training?	▪ The ultimate purpose of training is to achieve a significant change in an organisation's achievement of its mission. Impact evaluation must address this issue; ▪ Course evaluation is critical for improving an organisation's training programme and can involve various sources of information including participants, clients and external observers.
Any follow-up after training?	▪ Planning and conducting the follow-up of trained participants is a vital component of any training design. This will motivate staff to apply their newly-acquired knowledge and skills.
How to finance training?	▪ Cost-sharing helps organisations to value the training they receive; ▪ Staff who can afford to pay for training might be willing to contribute when participation in training is optional and when they observe a direct benefit (e.g. increased salary, promotion).

Management, supervision and leadership

Management ensures that processes and procedures, staff and other resources are used in an efficient and effective manner. In emergencies, there is no management style which is correct for each situation, but the ability and confidence of a relief manager in leading a team is a prime factor. After minimal training of the relief workers, supervision is crucial. Managers often forget this and become too desk-bound. Working *with* the staff implies that the manager is seen working in the field. This fosters team building and leadership apart from supervision. Managers are accountable for their staff, time, material resources, for making timely reports of what is being done and even for their health and welfare. Managers are also responsible for coordination and cooperation with government and other agencies to reach common practices in staff management. The following table summarises some important DOS and DON'TS for NGO managers.

10

Management

Table 10-29: The role of a manager: some DOS and DON'TS

Role of manager	DOS	DON'TS
Project focus	Implement the project according to the defined goals, objectives and strategies.	Never keep searching for other potential opportunities and forget the long-term goals
Prioritise	If multiple interventions are proposed but only limited funding and staff, focus resources on interventions that an agency does best.	Never respond to every emergency and overstretch resources. Otherwise the project may show little impact.
Communicate aim of project	Remind everyone in a project about what is expected and hold regular meetings to clarify what the different starting points are.	Don't assume everyone has the same background knowledge or understands a goal in the same way.
Manage staff performance	Write individual and group work plans to remind team members of the goals, to keep track of activities and to help people see where they fit into the big picture.	Don't expect people to know what to do and when. Be careful not give staff so many responsibilities that they let other team members down.
Promote learning	Become an effective NGO by acknowledging both successes and failures through ongoing monitoring and evaluating.	Don't assume that discussion of project results is enough for evaluation. Negative experiences are often under-reported.
Information management	Get the facts right and double-check critical information especially if it will be shared with other partners	Don't rely on your staff to verify all reports unless you are absolutely certain that they did.
Adapt to change	Be flexible and adjust to evolving scenarios and challenges by trying out new ways of doing things.	Don't feel too comfortable with organisational goals and mission and assume that just because it worked before it will always work.
To lead	Occasionally make decisions on tough issues when no one else will. Sort out problems and conflicts before they happen and admit mistakes.	Don't hope that things will work out by themselves. Managers should avoid the culture of blaming their mistakes on others.
Be realistic	Recognise that projects seldom work out exactly as planned, so expect setbacks and have a contingency plan whenever possible ...	Don't complain if something doesn't work out as expected. Be strategic and find a way around the problem.
Share information	Always keep lines of communication open. Be strategic about sharing information by identifying the relevant point people who will be able to act on the information.	Don't assume that the few people who are informed will automatically inform others and don't assume that everyone understands English well.
Be a role model	Keep your word, be honest, treat all staff and colleagues with respect and fairness and help other NGOs whenever possible.	Don't break promises, treat staff or colleagues badly. Never 'borrow' ideas from other NGOs or take credit when it belongs to someone else.

Team building

A team is a group of people who work together to achieve a common goal. Each member has unique skills that contribute toward reaching the goal. Some teams are created for a specific task and then disbanded. In emergency situations, teams are often more long-lasting because they might be recruited for the entire project life. In a small project, the entire workforce can be a team while in a large programme staff might form teams according to the services they deliver e.g. health care, water and sanitation and food distribution. Just because a group of people work together does not mean they are an effective team. A team is not a committee. Each must contribute to the desired goal. It is the job of their team leader or manager to form, support and inspire the individual members so that they can work and relate as a team. Especially in groups where teams are made of volunteers, team building activities can be an important part of motivating the group.

International Federation team using creative management tools. Photo: International Federation

The following stages are critical for team development:

- **Formation** is the stage where the leader helps each member to change from working as an individual to group action. Although little work might be achieved in this stage, it is important for members to start relating and identifying with each other.

- **Conflict resolution** is the most difficult and often the most stormy stage of team development. As differences and challenges in assigned tasks emerge, team members begin to resist working together. In an emergency situation, they usually work very hard and after a short while some will show exhaustion and signs of 'burn-out'. Disagreements and tensions increase as team members become less devoted to their work. It needs a skilled supervisor to assist the team to overcome obstacles and realise that they are going through a passing phase.

- **Normalisation** is the stage where team members form friendships with their colleagues and start to sharing common goals and exchanging constructive feedback. Often cliques are formed inside the team, which can be useful, but equally harmful to the overall team performance. Good team managers must be part of the team, interact and counteract with all accordingly despite themselves being equally exhausted and overloaded with work.

- **Getting work done** is the final this stage where team members will accept each other's strengths, weaknesses and the need for each individual to have a unique role. As a result, they take pride in their collective accomplishments.

Stress management

Stress is defined as an adverse reaction to the way one copes (or fails to cope) with problems or demands made on one. Most humanitarian workers experience some level of stress in their daily work, which involves critical issues of life, death, and illness. As disaster situations evolve, relief workers have to cope with exhaustion, changing levels of security, health risks, financial pressures, revised organisational policies and public opinion etc.

10

Management

Types and symptoms of stress

Not only must the team leaders and managers have a reasonably good understanding of the types of stress that might affect relief workers, the team members themselves must have a basic idea about stress symptoms by observing each other including the team leaders. Positive stress is a normal healthy reaction to difficulty and challenge. This might even be motivating and rewarding to a relief worker. Negative stress, however, can become a serious threat to mental and physical health. Examples of negative stress are:

▪ Cumulative stress should be maintained within reasonable limits otherwise it can lead to 'burn-out' or the physical and psychological exhaustion from working in overwhelming situations. Burn-out occurs where there is inadequate supply of workers among people who have an over-developed sense of responsibility (common in some managers). Sometimes, burn-out appears after the mission is over;

▪ Traumatic stress is a normal response to 'critical incidents' witnessing or experiencing an act of violence, a road traffic accident or a sudden-impact natural disaster. It might develop into Post-Traumatic Stress Disorder (PTSD) if neglected. In PTSD, the symptoms of traumatic stress persist for at least a month and requires treatment by a specialist;

▪ Secondary trauma describes the range of psychological and physiological effects experienced by those working closely with traumatised individuals. Exposure to a refugee's trauma might trigger symptoms that resemble those of the patient or effects of other trauma experienced by the therapist.

The symptoms of stress experienced by a staff member will depend on his or her prior level of function and social support and ability to cope, which may be influenced by one's culture. It is important for team leaders to know their team members well in order to recognise any significant signs of stress, such as:

▪ Physical symptoms that have no obvious organic cause, e.g. fatigue, nausea, vomiting, headaches, abdominal and back pains, lack of sleep.

▪ Emotional symptoms such as anxiety, guilt, fear, inexplicable mood swings, prolonged sadness, changes in temper.

▪ Cognitive signs such as poor concentration, confusion, apparent loss of memory, poor decision-making, and inability to do normal tasks.

▪ Behavioural changes such as an increase in alcohol intake, a change in eating habits or sexual behaviour, an increase in risk-taking (e.g. dangerous driving), poor performance etc.

Stress prevention

Stress management is the key to sustaining the mental and physical health of all relief workers including managers. Mostly, stress can be prevented proactively:

▪ Ensure that staff have a clear sense of their personal roles and mission objectives;

▪ Ensure adequate preparation and training of staff before missions and debriefing after the mission;

▪ Prescribe and enforcing suitable security rules and regulations;

▪ Ensure effective communication, including regular meetings;

▪ Adjust workload fairly and promoting reasonable working hours;

▪ Manage change and interpersonal conflict effectively;

▪ Address staff welfare issues e.g. excessive use of alcohol or drugs, lack of privacy;

▪ Organise extracurricular activities and social events;

Management

- Establish a system for sending staff on vacation, rest and relaxation leave where applicable;

- Ensure adequate leave or rest and relaxation leave is provided;

- Minimise overloading team members with too many responsibilities or a larger workload than is reasonably manageable during a normal working week.

Counselling

Provide staff with counselling when needed. Counselling provides support, a sympathetic ear and, where appropriate, advice to a team member who is experiencing problem of a serious, or potentially serious nature.

Stress-related problems can lead to unsatisfactory performance and misconduct. Managers and team members should monitor the staff's performance and feelings regardless of their training or experience in relief work. Openly and regularly discussing problems inside the team is essential. Relief work is a major stressor and all workers, therefore, must have easy access to counselling. Counselling helps people to acknowledge openly their physical, emotional or psychosocial problems that arise from stress and resolve them. All team members can provide simple one-on-one counselling informally without documenting it as counselling. Relief workers should not fear that the confidentially revealed information could be used against them. Any worker with persistent stress problems or trauma might need referral for specialised counselling, care and follow-up.

Counselling can thus increase staff productivity and prevent the need for formal disciplinary procedures. Many international staff and delegates bring some emotional baggage with them fleeing personal problems that should have already been sorted out before. It is very hard to detect beforehand and can be a bad start for a mission. If these problems are allowed to accumulate with stressful relief work, it could spell a disaster for that individual and suicides do happen. When dealing with excessive drug or alcohol abuse, address both the personal and the professional consequences of the problem. Standard procedures should be followed when faced with workers with a persistently unsatisfactory performance or gross misconduct due to stress.

Debriefing

Regular debriefing sessions during operations and when staff leave the field are an important feedback mechanism. They assist staff members to manage and reduce stress for themselves and also their colleagues. Debriefing is a process in which information is obtained by management from those in the field. Field personnel contribute first-hand knowledge and provide management with important feedback. Once their assignment with a relief agency is over, staff members need a thorough debriefing which is a two-way exchange of experiences. A well organised and conducted debriefing is an important part of human resource management. A positive send-off will make staff members feel that the agency values their contribution to the relief programme. It will also improve the impression that staff members might have of the agency and its management. It might also provide an opportunity to seek constructive feedback from staff members about the management of the operation.

Managers must take time to carry out the debriefing particularly for staff members no matter their experience who have just concluded a difficult assignment. Debriefing, therefore, becomes part of stress management. It can be followed up by a medical examination or psychological debriefing, where necessary, to detect any long-term effects from the mission. Professional help should be available for staff members with emerging or continuing problems. Departing staff members should be made aware of possible delayed symptoms of stress and advised how to deal with them if they occur. Staff members returning to their families after a long mission need to understand that re-adjusting to normal life outside the relief operation takes time.

Improving team health and welfare

Managers are responsible for the health and welfare of their staff and volunteers. To ensure good physical and mental health of expatriate and local staff and volunteers during their mission, relief managers should always be concerned about the health and welfare of their team members. Appropriate preparation before the mission is essential to ensure that expectations are realistic. The health and welfare concern should be expressed from the initial work assignment through the entire mission to ensure healthy and motivated staff. As well as rewarding staff for their achievements, team leaders should reward staff for sustaining their health and welfare by arranging for them suitable working hours and conditions, giving them regular and long enough Rest and Recuperation (R&R) depending on the situation. Delegates are often unwilling to leave their important work, despite exhaustion. Team leaders should strive to prevent health problems before they become critical. Team leaders should not allow their team members to work 100 hours per week, week after week without rest and recuperation. They should also provide counselling and change work responsibilities for staff in stressful positions to prevent burn-out. Special efforts should be made to encourage staff to take anti-malarial prophylactics if indicated and reduce further health risks from stress, TB, HIV/AIDS and alcohol. Relief managers should ensure that all staff members leaving the project are given an appropriate send-off by their team.

Managers can also try to improve staff health and welfare by:

- Defining the organisation's responsibility to staff health and welfare before, during, and after the mission and ensure that the staff both local and international know that medical evacuation plans are being made for them;

- Selecting staff with good physical and mental health and conducting dental and medical examinations (including TB) and psychological testing as practicable;

- Providing effective malaria prophylactics and inoculations as needed for diphtheria-tetanus-polio, hepatitis A and B, yellow fever, meningitis, Japanese encephalitis etc.;

- Ensure that all staff benefit from medical and accident insurance, which can extend beyond the mission for those who might become incapacitated by their work. The manager should keep records on which insurances each member has as well as a list of their family contacts;

- Ensure that all staff before their mission receive:
  - Pre-mission briefing (origin of emergency, future prospects, work environment and job responsibilities);
  - Practical advice on living conditions (appropriate dress, water, food, security, rest and recuperation);
  - Information about local traditions and behaviour, gender issues, etc.;
  - Security briefing;
  - Counselling (stress, alcohol, STDs/HIV);
  - Self-protection (clothing, bed nets, anti-malarial drugs, first aid kit etc.);
  - Basic skills training (first aid, security incidents etc.);

- Ensure security is well managed and, if possible, all have walkie-talkies, mobile telephones, that cars have long wave radios and people report regularly, especially if travelling;

- Ensure that satellite phones are available and that regular contact with families is provided for if mobile telephones are not working;

- Ensure that accommodation or reasonable allowances are provided. Good food is crucial. Where necessary, Rest and Recuperation is allowed for all staff that have been recruited from outside the location or reside without their families;

- Ensure that, although aid workers are on duty twenty-four hours a day, they have time off in the week and annual leave during their mission. When the nature of work is urgent, demand longer working hours, but as soon as the crisis has passed, ensure that working hours are normalised;

- Ensure that a formal programme for debriefing staff is in place within the operation.

Supervision

> The deepest need in all human beings is the need to be appreciated. (William James)

Supervision is 'a process of guiding, helping, training and encouraging staff to improve their performance in order to provide high quality services.' It begins with monitoring to identify gaps between actual performance of staff and set standards. This is followed by advising, supporting, joint problem solving and two-way communication between supervisors and the staff being supervised. If necessary, training and continuing education can be organised to meet and sustain the learning needs of all staff at the target site. In emergency and post-conflict settings, supervisors must do more than simply collect statistics and report on problems. As well as ensuring that there are always adequate resources and other support for a smooth service delivery, supervisors will also assume other roles such as setting goals, leading and motivating staff and maintaining relations with concerned stakeholders.

Supervision must also be conducted in the field and fieldwork, where supervisors must engage to get a correct impression of the challenges and working conditions on the ground. This gives the teams the feeling that supervisors care about and are part of them. Finally, supervisors are also communicators relaying policies from management and headquarters to health workers and ensuring that the organisation leaders are aware about the key problems and concerns of the workforce. Supervisors are also communicators with the government and other agencies and must keep the team informed about such meetings and the decisions taken. The following table provides a summary of characteristics that are desirable for supervisors of humanitarian workers:

Table 10-30: Characteristics for good supervisors

- Ability to inspire others, establish trust and promote teamwork
- Good communication skills, especially active listening and constructive feedback
- Desire to empower others and provide opportunities for growth
- Ability to work in teams
- Transparent and give equal support and opportunities to all
- Positive character and manner
- Experience in emergency health services
- Technical knowledge
- Flexibility
- Openness to new ideas
- Problem solver
- Ability to train or convey information to others
- Empathy

Anyone based at or other people who make periodic visits to the work site can become a supervisor. On-site supervisors as part of their normal work can help with the improvement of their staff's performance and quality services. Since raising staff salaries is not always possible, supervisors must find other ways of motivating their staff e.g.:

recognition and reward for good work, involving the staff in decision-making and supporting career development and growth.

The benefits of good supervision include fewer routine problems as the staff learn to address issues by themselves. This will increase their motivation and commitment to work. Good supervision is particularly critical where service providers are overburdened and lack the necessary technical knowledge or skills. Unfortunately, supervision in these settings can be sporadic with different supervisors giving confusing or conflicting directives. Common mistakes in supervision during emergencies and resource limited settings are summarised below with the recommended actions.[12]

Table 10-31: Common errors and suggestions for improving supervision

Common errors	Suggested action
Roles, responsibilities and authority for supervisors are poorly defined.	Develop supervision guidelines that define potential supervisors, their scope of work and relationships with other supervisors.
Visiting emote facilities infrequently	Dedicate resources to support at least one visit per quarter for all sites.
Supervisors often critical, focusing on reporting problems and assigning blame and acting as inspectors	Train supervisors about the facilitative supervision approach which promotes quality improvement processes so staff are supported and encouraged to learn how to improve performance.
Superficial and unstructured supervisory visits	Use supervisory manuals and/or standard checklists to facilitate self-assessment and problem solving. Recruit and train supervisors on use of checklists for practical mentoring and reinforcing new skills among service providers.
Lack of transport and other resources for supervision	Dedicate transport, human resources and other management support according to the agreed supervisory schedule.
Supervision visits disrupt the delivery of normal services	Fixed and reliable schedule for supervision is essential for work planning and active participation of all staff.
No feedback from supervisors	Mechanism for extracting key findings from supervision report and sharing information with providers from target facilities. Key findings may be written in a supervision record book at the time of the visit.
Low awareness about new guidelines or performance standards among providers	Distribute guidelines and standards with wide dissemination to all staff via on-site meetings and orientation. Monitor availability of guidelines, standards and implementation by staff during supervisory visits.
Too many difficult problems for supervisors to resolve in a single visit	As most problems often result from complex processes or faulty systems rather than health workers, look for root causes and find appropriate solutions. Understand that the role of supervisors is to facilitate, communicate and inform others about existing problems.

Common errors	Suggested action
Inadequate support for supervisors	Establish a network of supervisors with different skills and expertise who can address a variety of problems (e.g. construction, commodities, equipment, human resources, communications etc.). Circulate a contact information sheet.
	Request all supervisors to share experiences and lessons learnt.

Checklists have been created that serve as effective supervision tools. They mainly focus on issues of provider-client relationships and client satisfaction, but only to a lesser extent, on staff working conditions. Reviewing with staff these checklists that might be limited only to the activities and resources that are essential for service delivery according to expected standards will help supervisors demonstrate how work should be organised while giving insight to service providers on what is expected of them. Below is an example of a simple checklist that can be used for performance needs assessment or the supervision of field managers according to set standards and guidelines.

Table 10-32: Sample supervision checklist for improving performance[12]

Supervision checklist	
Do aid workers have written job descriptions?	Yes ☐ No ☐
Are aid workers involved in developing work plans?	Yes ☐ No ☐
Do aid workers receive recognition for their work?	Yes ☐ No ☐
Do aid workers have sufficient skills for performing their work?	Yes ☐ No ☐
Do aid workers have the necessary resources to do their job well?	Yes ☐ No ☐
Are aid workers involved in decisions about services at their work site?	Yes ☐ No ☐
Do aid workers know if they are performing according to expectations?	Yes ☐ No ☐
Do aid workers receive feedback or advice on how to improve their work?	Yes ☐ No ☐
Do aid workers have opportunities to develop skills for job promotion?	Yes ☐ No ☐
Have aid workers been visited by a supervisor in the past six months?	Yes ☐ No ☐
Count the total number of times respondent answered Yes *Divide the total number of Yes by the total number of questions X 100*	**Total score:**_____ **(%) score:** _____

The above checklist suggests that the supervisor and the staff being supervised must rate the total percentage as below:

- Between 80% to 100%—Job well done; therefore continue;
- Between 60% to 79%—Job performed quite competently, but a need for more practice;
- Below 60%—Need for coaching by an experienced supervisory staff member.

Leadership

> '… leadership is about giving a team or organisation the courage to truly commit to extraordinary goals. Well-managed teams understand their capability extremely well and set commitments they know they can meet.'

Leadership is not the same as management or supervision. Each has its own function and all are essential for project success. But in emergencies, leaders might have to be managers and supervisors as well. Leading should enable others to face challenges to achieve the desired results. Many managers try to ensure that agencies deliver what they are supposed to in normal settings while supervisors strengthen the quality of service delivery even under resource-constrained conditions. Leaders, however, are particularly important in emergency or post-conflict settings because they help projects move forward despite the all obstacles. Translating project plans into action and introducing new approaches to improve performance require competent relief managers and supervisors who can ensure that projects are carried out as planned to achieve the objectives. But it also needs managers and supervisors with good leadership skills to inspire people to find the strength to overcome obstacles and long-standing barriers to reach the mission's overall goals.

Good management and leadership skills are needed at all levels of a humanitarian response from national to facility level. Many agencies allow their staff to move up the management ladder through *promotion*. Yet not every aid worker or manager will become a good leader. The higher one moves up the ladder, the greater the changes in job descriptions from direct service delivery to *enabling* other staff to do the work. This demands that leaders and managers change how they relate to their peers and recognise that issues affecting one or more staff can become leaders' problem as well. When some leaders are faced with more problems than they are trained to deal with, they slip back to the management roles they are familiar with and the opportunity to inspire and to lead slips away. Humanitarian agencies must help support new leaders develop their full potential.

Developing effective leadership qualities takes time, either while learning to manage other aid workers or to lead other managers. Manager also must learn to apply different leadership styles for different situations. The table below gives a summary of four district leadership styles.

Management

Table 10-33: Leadership styles[12]

Leadership style	Advantages	Disadvantages	Examples when applicable
Authoritarian Leader makes all decisions and informs staff.	▪ Saves time; ▪ Decision clear and final; ▪ Leader in control.	▪ Not all options considered; ▪ Staff might not be committed.	Crisis situations when there is no time to lose e.g. mass casualty incident.
Consensus Building Entire group discusses and agrees to support group decisions. Leader maintains authority.	▪ Staff feel more involved and thus more supportive of decisions; ▪ Greater likelihood of successful implementation.	▪ Time consuming,: might be needing many meetings; ▪ Compromise decisions might not be clear; ▪ Consensus not always possible.	Managers need to develop a proposal for an emergency health project that will be implemented primarily by field staff.
Democratic All members of group vote for their preferred decision.	▪ Staff feel more involved and thus more supportive of decisions; ▪ Greater likelihood of successful implementation.	▪ Might take more time ▪ Most popular might not be the best decision; ▪ Those on losing side might feel resentful.	When there is a need for organisational change that might affect all the staff either positively or negatively.
Delegation Leader assigns task of decision making to another person or group.	▪ Opportunity for developing leadership qualities in others; ▪ Greater likelihood of successful implementation.	▪ Leader sacrifices control; ▪ Might take more time; ▪ Team might lack the skills and knowledge for good decision-making.	When the manager has to leave to attend to urgent matters elsewhere and the emergency situation is relatively stable.

Managing constraints and changes

During the course of the relief operation, managers are constantly faced with an evolving situation and unexpected complications. Leaders and managers must be good problem solvers and work as agents of change. They should try to anticipate possible ways in which plans may go wrong and plan how to prevent such complications before they happen or have back up plans in mind. When constraints appear, good leaders can manage a swift transition to an alternate approach. The following table describes common constraints and possible actions.

Table 10-34: Examples of constraints and possible actions

Constraint	Suggested action
Inadequate or incorrect baseline data resulting in inappropriate project objectives e.g. only long-term objectives defined for a rapidly changing situation.	Improve information system and monitor trends and always set both short and long-term objectives for unstable situations.
Lack of basic skills among staff.	Not solved by increasing the number of workers but by recruiting the right staff and providing on-the-job training.
Procedures for procuring material resources are too complicated causing delays in setting up the relief project and poor quality of outputs.	Train logistics staff on basic procurement procedures while initially ordering for standard emergency kits.
Public Health Workers (PHC) approach is not supported by professional health workers.	Facilitate dialogue on PHC concept and successful programmes.
Community participation might not occur in practice.	Discourage top-down decision-making.
Poor integration of community-based health interventions into the existing health care system e.g. CHW are not supported by the community and professional health team.	Involve all concerned in planning, implementation and evaluation of the project.
Environmental changes are beyond managerial control causing an increased incidence of communicable diseases.	Improve surveillance for early warning signs.
Sudden epidemic arises.	Call a meeting with all authorities and community to make a emergency plan of action.
Local population is hostile because the disaster victims are receiving better health care than them.	Negotiate with the local population leaders and authorities about the assistance they expect.
Unexpected population influxes arise from the worsening political situation in neighbouring regions.	Plans for a relief response to unstable emergencies should be flexible.
Unexpected population influxes arise from the worsening political situation in neighbouring regions.	Plans for a relief response to unstable emergencies should be flexible.
There are chronic delays by central authorities (agency, host country, donors) in responding to emergency requests.	Improve data collection and reporting.

Sometimes the problems or needs identified during the assessment might evolve needing changes to be introduced. A plan that no longer addresses the needs of beneficiaries, overlooks vulnerable groups or causes serious negative effects should be changed or abandoned. Since not all changes are easy to implement, review the plan to determine if it should be adjusted to the reality rather than the partners doing this. Any change of plan should be discussed with everyone who might be affected. It is easier to implement change when all partners approve the changes to the original plan.

Financial management for humanitarian response

All organisations need people who can deal with money. As well as human resources, accounting for project funds is among the most time consuming for a manager. Good financial management is based on four building blocks:

- **Keeping records** for good accounting requires up-to-date records for all incoming and outgoing financial resources or in-kind donations. Funding received or pledged is often recorded on Memorandums of Understanding, contracts or letters of commitment from donors and other partners and cash receipts. Expenditure records can include the quotations for procurement requests, waybills for large shipments, invoices for deliveries or services rendered and payment receipts. These basic records provide evidence that transactions have taken place and when. It is important to keep all these records carefully filed and safe. All transactions must be documented in detail in a 'cashbook,' a register or list that shows how much has been spent, on what and when. Filing basic records in good order and entering all transactions regularly in a cashbook will ensure project accounts are satisfactory and up-to-date.

- **Internal control** provides humanitarian agencies various control measures so that money cannot be misused. Commonly used financial controls include:

    - Keeping cash in a safe place, ideally in a bank account;
    - Making sure that all expenditure is properly authorised by one or two top managers;
    - Following the budget;
    - Checking how much money has been spent every month and on what;
    - Employing qualified finance staff;
    - Carrying out a financial audit regularly;
    - Carrying out a bank reconciliation' every month, which means checking that the amount of cash in the bank is the same as the amount that the cashbook states as the remaining balance.

Note: Conducting a bank reconciliation is particularly important as it proves that the amounts recorded in the cashbook and the reports based on it are accurate.

- **Budgeting** helps managers prepare more accurate detailed budgets although an overall budget might have already been prepared when a humanitarian programme was designed. This helps determine how much money will actually be needed to support the proposed work or in case there are changes in the work plan. A budget is only useful if it reflects the actual costs during the time of implementation. The first step in preparing a detailed implementation budget is to confirm exactly what is needed and how it will be obtained. Identify all proposed inputs, plan how much each will cost and how much outputs they will generate. If there are any significant variations with the preliminary budget (e.g. above 10%), revision should be considered and it might be good to consult with the donor or other partners. A common problem is that the budgeted plan of action cannot be implemented due to lacking resources (funds or in kind). The programme manager, therefore, must have a priority list in mind of which services are absolutely essential to keep and which activities can be reduced, postponed or stopped. When budgeting, it is also wise to include contingency planning to cover sudden changes or new challenges, which are common in emergencies. Funding should also be set aside for appropriate evaluations.

- **Financial reporting** and its producing and reviewing of financial reports are the final building blocks. Reviews and reports are an information summary of all incoming and outgoing funding as documented in the cashbook over a set period. Similar

transactions for a specific category of incoming or outgoing funds are often combined. For instance, all money spent on fuel, new tyres and vehicle insurance can be added together under 'Transport Costs.' Similarly, all money spent on wages, training, technical support can be combined under 'Human Resource Costs.' A system of codes can be used to document transactions to different categories. These categories might often be defined by donors who might also specify the format and timing for financial reporting.

Monitoring and evaluating relief projects

Figure 10-13: The project planning cycle—monitor and evaluate
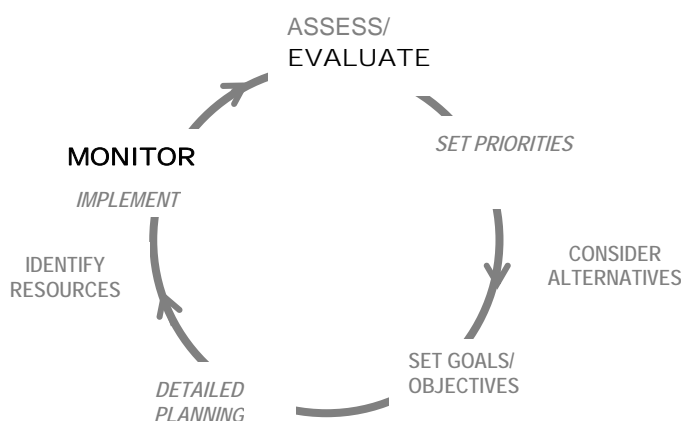
Programme monitoring and evaluation provide a powerful means for building support for assistance to displaced populations. It is important that relief programmes are evaluated as follows:

▪ **Formal or initial evaluation**—usually known as **needs assessment**, carried out before starting a programme—asks, 'What is happening?

▪ **On-going evaluation**—usually known as **monitoring**, carried out during implementation by those managing it—asks, 'How is the programme progressing?'

▪ **Interim and final evaluation**—an interim evaluation, usually known as **process evaluation**, or sometimes **desk review** is carried out between programme phases, might ask, 'What has been achieved from the resources allocated? What are the other needs?' The final (end-of-project) evaluation, usually known as **outcome evaluation**, asks, 'Have the objectives been achieved?'

These three evaluations are essential for good programme management. They provide information on the full range of an emergency situation and the relief response. The information gained can establish or confirm relief programme priorities, link resources to needs and measure programme results against the original objectives. Most relief programmes carry out an initial needs assessment and on-going monitoring. However due to limited resources, process and outcome evaluations might not be carried out adequately or, sometimes, omitted altogether. This reduces the opportunity to learn key lessons that an emergency programme or project can teach and, particularly, how the recipients have benefited.

The rest of this section will discuss in greater depth about ongoing and final evaluations for humanitarian programmes in emergency and post-conflict situations.

Monitoring

Monitoring primarily closely follows the implementation of a project to look for difficulties and delays that must be corrected. It concentrates on project *inputs, outputs* and *processes* while checking the progress of work against earlier identified indicators. It also attempts to identify reasons for any differences between actual and planned results. Any evidence from the monitoring process helps develop performance standards and 'best practices' for current and future projects.

Purpose of monitoring

- To make sure the programme is implemented as planned:
    - resources are mobilised as scheduled;
    - services and products are delivered as planned;
    - beneficiaries are receiving quality services as intended;
- To detect when something goes wrong so that it can be fixed (a supportive role);
- To revise objectives if these were inappropriate in addressing the original problem, or if the situation has changed;
- To measure with precise data, what is being achieved as the project moves forward.

A good monitoring system can show whether or not actions are in line with the project goals and objectives and where the plan must be adjusted. Monitoring programme **outcomes** and impacts can also reduce the amount of work involved in an interim or final evaluation. Monitoring is usually done through a **health management and information system** as defined below:

> An information system consists of people, equipment and procedures that are organised to provide information (e.g. use of health services, disease surveillance, health status of affected population and programme management) to health workers in a way that enables them to make informed decisions.

Setting up a Health Management and Information System (HMIS)

The objectives of a HMIS include:

- Following trends in the health status of the affected population to establish health care priorities;
- Detecting and responding to epidemics;
- Identifying and responding to other specific needs as they develop or are detected;
- Evaluating programme effectiveness, coverage and quality of services delivered;
- Ensuring that resources are targeted to the areas of greatest need.

To be effective, the HMIS should:

- **Collect only the most relevant data** which is of direct relevance to work and conforms to the data processing capabilities;
- **Be simple, up-to-date and cost-effective** to consume the minimum amount of time and resources to collect and analyse;
- **Be action-led** and linked with decision-making and feedback. Data collectors should also be able to use and analyse the data and information they collect for their decision-making;
- **Be able to change direction** according to the nature and type of information needed as the needs of the disaster-affected population change.

A very systematic approach is necessary when establishing a HMIS. The following steps can guide people in either establishing or strengthening a HMIS where none exists or when one must be strengthened:

▪ Appoint a lead person or agency to be responsible for the Health and Management Information System (HMIS);

▪ Define the reporting lines and key personnel;

▪ Define what data is needed to monitor programme objectives and targets (see table below);

▪ Define standard procedures for data collection, analysis and reporting;

▪ Procure appropriate equipment and tools;

▪ Organise staff training and supervision on a HMIS;

▪ Develop mechanisms for responding to health problems detected through the HMIS;

▪ Periodically review and adapt the HMIS to changing programme needs.

Table 10-35: Examples of programme process indicators

Emergency health service	Output	Coverage	Quality of services	Target
Nutrition	# beneficiaries/ month	% population getting an average 2,100 kcal/p/day	Global malnutrition rate for children < 5 years	Malnutrition rate < 10%
Water	# Litres/person/ day	% population within 15 minutes walk to safe water sources from shelters	Water quality Frequency of water shortage	Average water supply: 20 L/person/day
Sanitation	Persons/ functioning latrine	% population with latrines close enough to dwellings for safe access, day or night.	Cleanliness of latrines	Latrine coverage: 1 per 20 people or 1 per family
Maternal health care	# ANC visits/month	% mothers with child < 24 mos. who received ANC at least once before delivery	% of high risk pregnancies detected	All pregnant women: (estimated at 25% of women)
Child care	% mothers counselled on breast-feeding	% children 18-23 months breast-fed until aged 18 months	Infant Mortality Rate (IMR)	IMR < 2.0/ 1,000/ day
Immunisation	% children vaccinated/month	% children 12-23 months fully immunised	Measles incidence and mortality rates	>= 95% measles coverage 40% vaccine loss

Emergency health service	Output	Coverage	Quality of services	Target
Disease control	# diarrhoea cases given ORT/month	% diarrhoea cases given ORT	Frequency of Oral Rehydration Solution shortage	100% ORS availability
Health education	# home visits/month	% homes visited by CHW	Level of awareness	100% coverage
Treatment of common diseases and injuries	# patients treated/month # admissions/ month	% malaria cases treated	% emergency cases detected early Case Fatality Rate (CFR)	Acute phase: Total visits = total population Post-emergency phase: 4 visits/person/year
Essential drugs	# prescriptions /month	% population with access to essential drugs	Frequency of drug shortage Cost per prescription	Acute phase: NEHK Post-emergency: essential drug orders

Please refer to the health systems and infrastructure section for more information about setting up a Health Management Information System (HMIS).

Evaluating

An evaluation is '*the periodic measurement of performance against intentions*.' In other words, it is the systematic review of the relevance, efficiency, effectiveness and impact of a project in relation to its *goals* and *objectives*. This implies that evaluation can only be performed if objectives and quantifiable indicators of success were defined during the design of a relief project and adequate baseline information is subsequently collected. When carrying out an evaluation, it is important to:

▪ Look at whether the original problems to be tackled have changed since a project began, whether the population needs have changed and whether the objectives have been achieved or not in order to improve on-going operations (**Interim** or **process** evaluation).

▪ Measure the actual results against the set goals and analyse reasons for success or failure in order to draw lessons for future planning, programming and decision-making (**Final** or **outcome** evaluation).

Note: Evaluation is a management and learning tool. It does not 'put the project on trial,' like an inspection, or on-the-spot checks which investigate a particular problem to determine appropriate solutions or and audit which is a review of whether activities measure up to set financial or management standards.

Developing a Monitoring and Evaluation (M&E) plan

Once a humanitarian project is approved for funding and the HMIS and other data collection systems are in place, it is important to produce a good monitoring and evaluation plan if none was developed during the project design phase. This will reduce duplication of effort in data collection, analysis and reporting during the project implementation. An M&E might be easily developed by addressing the following questions: *why, what, who, where, when* and *how* to carry the evaluation as shown below.

Table 10-36: Key issues in developing a monitoring and evaluation plan

Key question	Suggestions
Why? Why do you need this information? What is the purpose of the information?	**Anticipate the use of the information and who needs it.** Initially: to confirm progress and identify constraints Later: to assess if project objectives were met
What? What should be measured? What can show the achievement?	**Select a few key indicators for monitoring**. Inputs, processes, outputs, outcomes and impact
Who? Who will collect the information? Who uses the information? Who should be involved?	**Select a multi-sector team of surveyors or evaluators**. Primarily local authorities, programme staff, and beneficiaries A few external consultants and/or donor representatives Appoint a focal person or unit to lead and coordinate all M&E activities.
Where? Where will data gathering take place?	**Identify the sources of information and select sites**. Project sites e.g. health facilities, households External local health authorities, other sectors
When? When will information be collected? How often?	**Determine the frequency and set the timeline for reporting** Ongoing: Monthly, quarterly Periodically: annually, mid and end of project
How? How to track indicators? What mechanisms are in place for tracking and reporting programme activities?	**Select a combination of methods for collecting and reporting data**. Improve or develop Health Monitoring Information System or other routine recording/reporting, sentinel surveillance, planned or additional baseline and follow-up surveys, focus group discussion, key informant interviews, supervision visits and onsite tours. Arrange for dissemination via programme coordination or review meetings.
How much? How much it will cost? Is there a cheaper option?	**Determine budget and identify sources of funding**. Include material, human resources, logistical and communication costs and if external data collectors are needed. Estimated M&E costs: 5% to 10% of overall programme budget

How comprehensive a project a Monitoring and Evaluation plan (M&E) needs to be depends on the evaluation's purpose, its goals, objectives and timeline for the project, the local capacity and resources for carrying out the evaluation including logistical support, funding and technical know-how and the donor requirement. Short-term projects of less than six months might not require a detailed M&E and only conduct routine monitoring and a simple end-of-programme review of the existing work plans with monthly or quarterly reports. In many natural disaster situations, the objectives and activities also change over time in the emergency phase, the stabilised phase, early recovery bridging

into development, capacity building and mitigation with disaster preparedness. The time line can be months, but often longer and occasionally years. M&E has to be adjusted accordingly. Because outcomes of some projects might be difficult to measure, involving project planners in M&E might help them define more measurable goals and objectives when designing future projects. From the beginning, key persons with responsibilities for M&E project activities must be trained. A simple flow chart may be included in the M&E to better illustrate how the information will be passed from the site of origin e.g. the health facility or household to the local and centralised M&E unit. The flow chart should show a feedback mechanism so that the data collectors can learn how to ensure the information they submit is complete, timely and accurate.

Methods of evaluation

Which type of evaluation is carried out is determined by who is included in the evaluation team. It might be carried out by the project staff, beneficiaries and/or external supporters:

▪ **Internal evaluation** happens when members of the implementing organisation evaluate their own relief projects. Results from this type of evaluation are subjective, particularly when future funding depends on good performance, since they deal with how people feel about a project rather than concrete results from it. While some internal evaluators are immediately familiar with all aspects of the programme and often pose less threat to others involved in the activities, they might lack objectivity and/or special evaluation experience;

▪ **External evaluation** is a more objective evaluation designed and conducted by bodies outside the implementing organisation. These evaluations greatly add to the organisation's credibility, but are more costly and time-consuming. More money should be invested in outside expertise for larger projects and for end-of-programme evaluations. Programme managers ensuring that external evaluators fully understand the goals and objectives, is critical to a relevant evaluation. This should be seen as a learning experience, not just an accounting for distribution of resources from donors;

▪ **Self-evaluation (Participatory)** projects can invite beneficiaries to participate as full partners with the organisation staff. The former might be better placed to explain how an intervention has benefited the target population: whether it was for the better or worse. They can also provide insight on areas that might have been overlooked during the project planning and evaluation. Trusted and respected members of the community might also be recruited to gather more sensitive information from the affected population. Finally, involving them enables the transfer of vital evaluation skills to the community.

The following table summarises the advantages and disadvantages of including different members of the evaluation team:

Table 10-37: Advantages and disadvantages of having various members on evaluation team

Evaluation team members	Advantages	Disadvantages
Beneficiaries	▪ Provide a unique 'user' perspective ▪ Might learn new skills ▪ Fosters co-operation and understanding between project staff and beneficiaries	▪ Might be influenced by other beneficiaries ▪ Might have vested interests
External consultants	▪ No vested interest ▪ Can apply 'lessons learned' to and from other projects	▪ Might not understand the local situation well enough ▪ Might lack support of project staff ▪ Can be expensive

Evaluation team members	Advantages	Disadvantages
Donors	▪ Have a good overview of programme goals and objectives ▪ Might improve understanding of the progress and the operating environment of a project as a result of their participation	▪ Might raise too many questions ▪ Can make programme staff and beneficiaries uncomfortable and possibly feel pressured to report progress inaccurately (i.e. tell evaluation team what they want to be told) ▪ Might have expectations and goals that are unrealistic or not the same as the agency's

Evaluation team members	Advantages	Disadvantages
Local authorities	▪ Provide a unique perspective of community-wide issues relevant to project progress	▪ Might be skilled in doing evaluations ▪ Might take too long to report findings ▪ Might be influenced by political interests (either their own or from elsewhere within the community)
Programme staff	▪ Good resource persons for immediate feedback	▪ Might find it difficult to criticise own programme ▪ Might lack objectivity ▪ Often perceived as less credible by donors and other outside parties due to natural tendency to be subjective

Key information from evaluations

As soon as a team of evaluators has been recruited, the members must be given all relevant project documents and background information. This will help them to define better which information is relevant for the programme, the key sources of information, methodology and timeframe for data collection, analysis and reporting. The following table gives examples of some issues that might be examined during evaluations.

Table 10-38: Information from evaluations

What were the project's objectives? To what extent have these objectives been achieved?	What is the relationship between the project objectives and the problems addressed?
In retrospect, how realistic were the objectives when they were set against existing limitations? What alternative objectives were considered and why were they rejected?	What factors account for the variations in the level and the distribution of benefits produced?
When were the benefits of the project expected to materialise, and when were they actually realised? How did this timing correspond with the timing of the needs which were addressed?	What were the intended benefits from the project? Who was expected to benefit from the project; who actually did and who did not benefit?

How was the programme organised, set up and financed? What was the level of involvement of the government at national and local level?	How were the various levels within the aid system linked? How well did the agency coordinate its activities with other responders?
Was the organisation's communication and co-ordination efficient? Was its structure flexible enough to adapt to changing conditions? Were decision-making and authority lines clear?	What pressures were exerted on the project and personnel? Where were these pressures generated?
What opportunities existed for the beneficiaries to influence the project design?	Which way did information flow? To whom is the organisation accountable?
Has the project encouraged the growth of networks to facilitate problem-solving and learning between the communities and organisations?	How were project activities documented and how was the information utilised by the agency? What policy lessons have been learned from the project?
What effect did the project have on the coping mechanisms within the community? Did the project improve or damage the internal system? Was any dependency created?	What effect did the project have on the physical environment?
What effect did the project have on local and social processes, on the way different communities and individuals interact and participate in public life?	Was the system geared to avoid and solve conflict either internal or with other organisations?
Was there an effective control system for tracking the disbursement of financial and capital items and service provision?	What issues emerged during the setting up and management of the project that might be generalised to other situations?

Dealing with constraints

While an evaluation can be a powerful management tool for identifying project strengths and weaknesses, it is important to recognise that there are many constraints to project evaluation. Evaluators and programme managers should address the following constraints when planning or preparing for an evaluation:

- Goals and/or objectives are frequently unclear or unrealistic;
- Projects often accomplish positive effects besides 'documented' objectives;
- Health service programmes are usually complex and individual components are difficult to separate;
- Health outcomes are difficult to link to cause and effect;
- Proving that objectives have or have not been reached.

Preparing reports

Reports are management tools that summarise the results of monitoring the progress of a project or evaluating whether objectives have been achieved. Although different authorities and donors might request for reporting on different formats, all reports actually provide differently worded answers to the same basic questions, namely:

- What was intended?
- Has it been done?
- If not, why not?
- What is to be done next?

All humanitarian agencies must adapt to similar protocols for reporting to local health authorities by asking:

- What is to be reported?
- Who will prepare the reports?
- How often will the reporting be done?
- Which format or forms are appropriate?
- To whom and through which channels are the reports to be submitted?

Reporting protocols might vary for different levels of programme implementation. Frontline workers might simply be trained to summarise quantitative data from the field while the more senior staff e.g. project coordinators, might be more skilled in producing in-depth reports including daily situation reports in the early emergency phase, weekly situation reports when the situation starts stabilising, monthly reports, quarterly reports, final reports or special donor reports. Reports should be objective, factual and brief yet provide enough details for a reader to understand the context of the project. All information must be checked and verified and its sources quoted to establish reliability. Including the priorities and plans for the next reporting period as well as specific recommendations or action points are helpful. Produced in a timely and regular manner, reports must also be shared with programme managers at all levels, local authorities, representatives from the affected community and other concerned parties. This will ensure critical issues are addressed and increase support for the humanitarian or developmental efforts.

The exit and handover of services and equipment

The humanitarian organisation exit strategy has to be well planned for and ensure that services can continue. Many delicate situations occur when organisations suddenly leave and beneficiaries and patients are stranded. Military hospitals are known for providing short interventions. Military hospitals are often very well equipped, since they are designed to care for their own soldiers and civilians at a level appropriate in the country of origin. When they leave the quality of care that can be offered by humanitarian organisations or government is not at the same level and at time, the differences can be substantial. When humanitarian organisations are suddenly leaving, they leave sometimes big numbers of beneficiaries to care for, far outscoring the capacity of the host nation health services.

The International Federation and others practice an exit and handover approach, where the handover of services and handover of equipment and assets are negotiated well in before hand, and Memoranda's of Understanding (MoUs) are signed by the recipients (e.g. government, another humanitarian organisation or the host National Society). In the MoUs it is outlined how the recipient will use the assets and how they will benefit from regular training (sometimes for years).

Example of a successful handover

The emergency hospital in Banda Aceh, provided by the Norwegian Red Cross, provided care during the tsunami operations. After the work was completed, it was donated to the PMI (the Indonesian Red Cross Society) and Indonesian government. An Indonesian team was trained to look after the assets and to operate the facility. This field hospital was successfully used later in the Yogyakarta earthquake operations, run by PMI and Indonesian Ministry of Health with some technical support from the Norwegian National Society.

Management

Summary

Management is about taking the resources available and applying them in the manner most effective to achieve a programme's goals and objectives and improve the status of the beneficiary population. Good management is at the heart of any successful relief programme.

Poor management of relief programmes produces poorly organised, inappropriate, delayed and ineffective relief. Managers of relief programmes must be effective but flexible if they are to accomplish the organisation's goal otherwise the plans might only remain on paper. Planning a relief operation is hard work because it must be based on the best available information, which might be difficult to collect and be constantly changing. For every emergency, the health needs of the affected population must first be identified and prioritised because not all problems can be addressed at once. The detailed action plan should address both short-term objectives for immediate survival needs, followed by long-term objectives to foster recovery and build capacity of the affected population. Performance standards and targets must be defined to guide aid workers on what they are expected to do to attain programme goals and objectives. Once the humanitarian response is initiated, the resources must be mobilised and aid workers carefully recruited, trained and supervised.

While a needs assessment is useful for determining the initial response, and monitoring that the objectives are still valid for achieving the overall goal, relief agencies must recognise that an interim or end-of-project evaluation can greatly influence how future projects are planned and managed. Budget for the time and the resources for carrying out *all* evaluations from the beginning of a relief programme. How the results of each evaluation are used must also be decided in advance so that results can be presented in the most practical way. Representatives of the affected community must be involved in organising and carrying out all evaluations because relief organisation must be accountable, not just to donors, but also to the beneficiaries. The evaluation report must be well written because it represents the final historical record to what the project has achieved.

Photo: International Federation

Bangladesh – Photo: International Federation

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Earthquake in Yogyakarta, Indonesia May 2006. Little girl building her own little shelter (Phil Vine/International Federation of Red Cross and Red Crescent Societies

Glossary

A

Term	Definition
Access	The proportion of the population that can use the service or facility.
Acute diarrhoea	Acute diarrhoea (passage of 3 or more loose stools in the past 24 hours) with or without dehydration.
Acute flaccid paralysis (suspected poliomyelitis)	Acute flaccid paralysis in a child aged <15 years, including Guillain–Barré syndrome, or any acute paralytic illness in a person of any age in whom poliomyelitis is suspected.
Acute haemorrhagic fever syndrome	3 weeks) and any of the following: ▪ haemorrhagic or purpuric rash, ▪ vomiting with blood, ▪ cough with blood, ▪ blood in stools, ▪ epistaxis, ▪ other haemorrhagic symptoms.
Acute jaundice syndrome	Illness with acute onset of jaundice and absence of any known precipitating factors and/or fever.
Acute lower respiratory tract infections/ pneumonia in children <5 years	cough or difficulty breathing and ▪ Breathing 50 or more times per minute for infants aged 2 months to 1 year. ▪ Breathing 40 or more times per minute for children aged 1 to 5 years. And No chest indrawing, no stridor, no general danger signs. *Note:* severe pneumonia = cough or difficulty breathing + one or more of the following (inability to drink or breast feed, severe vomiting, convulsions, lethargy or unconsciousness) or chest indrawing or stridor in a otherwise calm child.
Acute malnutrition	Underweight and wasting are indicators of acute malnutrition. Among children, acute malnutrition is defined as weight-for-height of less than two standard deviations of the reference population median weight-for-height. Among adults, acute malnutrition is defined as a Body Mass Index of less than 18.5.
Accountability	The responsibility of demonstrating to stakeholders, including the beneficiaries, that humanitarian assistance meets with agreed standards.
Acquired immunodeficiency syndrome (AIDS)	A disease defined by a set of signs and symptoms characterised by the body's compromised immune response; caused by hiv and transmitted through body fluids (e.g., semen, blood).
Active child feeding	Occurs when the caregiver actively encourages her child to eat while remaining sensitive to the demands of the child.
Activity	An action within a project that is done to achieve an objective; actual

Glossary

	tasks that are required to produce desired outputs; activities transform inputs to outputs.
Adherence	Refers to how closely instructions or recommendations are followed regarding appropriate health behaviour or treatment from a health care provider.
Adjustment	Changing the plan according to new information gathered through monitoring. The alteration may be minor or dramatic, depending on the unforeseen event or change of circumstance.
Age-specific rate	A rate in which the information in the numerator and denominator is limited to persons within a particular age group.
Alternative providers	Part of the health system and may include the following: ■ Spiritual Healers, ■ Community health volunteers, ■ Traditional Healers, ■ Traditional Birth Attendants, ■ Elders
Anaemia	Defined by low haemoglobin concentration which reduces the transport of oxygen to the cells of the body. Severe anaemia is a haemoglobin concentration of < 7 g/dl or hematocrit of < 20 %.
Anxiety	Intense and prolonged fear or worry that can lead to mental distress or panic. A vague, unpleasant emotional state with qualities of apprehension, dread, distress and uneasiness. Frequently distinguished from *fear* that assumes a specific object, person or event, *anxiety* is often objectless.
Attack rate	The percentage of a well-defined population that develops an infectious disease over an outbreak period. Calculated by dividing the total number of people with the disease by the total population at risk at the start of the outbreak period.

B

Term	Definition
Barrel latrines	A barrel latrine is an option in places where the water table is high, the soil is too hard to dig, or the weather is cold (thus requiring indoor latrines). Typical designs incorporate a 200-litre barrel.
Basic MCI management	Basic mass casualty Incident management is composed of a series of steps that collectively meet the immediate health needs of disaster victims.
Beriberi	Caused by thiamine (vitamin B_1) deficiency and has been observed in refugee populations consuming polished white rice as the staple cereal. Clinical signs of "dry" beriberi are neuritis and limb paralysis; the sign of "wet" beriberi is edema, which can lead to cardiac failure.
Bias	Any effect while collecting or interpreting data that leads to a systematic error in one direction, e.g. recall bias.
Blanket supplementary feeding	Supplementary feeding for subpopulations which are malnourished or are at high risk of becoming malnourished during a food emergency.

Bloody diarrhoea	Acute diarrhoea with visible blood in the stool. To confirm a case of epidemic bacillary dysentery: take a stool specimen for culture and blood for serology; isolation of *Shigella dysenteriae* type 1.

C

Term	Definition
Camp	A place where a group of displaced people temporarily lodge in tents, huts, or other makeshift shelters. A camp setting may vary as follows: ▪ Tented cities relying wholly on external support; ▪ Small, open settlements where refugee communities are able to maintain a village atmosphere; ▪ Larger, more crowded settlements where its inhabitants are more dependent on external aid. Level of control exercised by national and international authorities.
Carrier	A person that carries a specific infectious agent—and can transmit it to others—but has no clinical signs of infection.
Case	An individual identified as having a particular characteristic, e.g. disease, behaviour, or condition.
Case definition	Standard criteria for deciding whether a person has a particular disease or health problem. Criteria can be clinical, laboratory, or epidemiological.
Case Fatality Rate (CFR)	The percentage of persons diagnosed with a specified disease that die as a result of that illness within a given period.
Case Management Protocol (CMP)	Protocols are designed to ensure a high and consistent level of care and should be followed by all agencies providing clinical health services. Most countries have established standardised case management protocols for treatment of common medical and surgical conditions.
Catchment area	The geographical area from which all the people attending a particular health facility come.
Census	The counting of all individuals in a particular population. Usually includes other details such as age, sex, occupation, ethnic group, marital status, housing and relationship to head of household.
Central level of clinical care	First contact of the community with the formal health care system. Not usually staffed by medical officers, rather, is run by medical assistants and other professional staff. Offers ambulatory care, limited in-patient care and reproductive care, community outreach services, and referral of emergent/complex conditions.
Chemoprophylaxis	The administration of drugs (usually antimicrobials) to prevent the development or progression of an infection to actual disease or to stop transmission and disease in others: ▪ Mass chemoprophylaxis — administering drugs to the entire population. ▪ Selective chemoprophylaxis — administering drugs to the highest risk group.
Clinical illness	Signs and symptoms that give evidence of an infection.

Glossary

Cluster sampling	A sampling method in which each selected unit is composed of a group of persons rather than an individual, e.g. villages, households.
Communicable disease (Infectious disease)	An illness due to a specific infectious agent or its toxic products that arises through transmission of that agent or its products from an infected person, animal, or reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host, vector, or object in the environment.
Community Health Workers (CHWs)	Also known as Health Information Teams (HITs), home visitors (HVs), or Village Health Volunteers, CHWs are members of the community who are trained to act as direct intermediaries between the beneficiary population and the health care system.
Community-based health care	When barriers to facility-based health care exist, community-based health care becomes very important. As discussed above, there are two ways of establishing community-based health care: ▪ Setting up a community health worker programme; and ▪ Integrating alternate health providers.
Community therapeutic care	Treatment of severe acute malnutrition on an outpatient basis, appropriate for uncomplicated cases (children who have good appetites, do not require a nasogastric tube for feeding, and have no edema) on an outpatient basis.
Complex emergency	An internal crisis of the state in which the capacity to sustain livelihood and life is threatened by primarily political factors and in particular, high levels of violence.
Complex humanitarian emergency	▪ A major man-made disaster that may be complicated by natural disaster(s), and loss of life. It often requires the support of a multinational military peace operation; ▪ A humanitarian crisis in a country or region where there is a total or considerable breakdown of authority resulting from internal and/or external conflict requiring an international response.
Conductivity	A measure that provides information on the chemical composition of water and affects taste, corrosion and encrustation.
Conflict analysis	Systematic study of the profile, causes, actors and dynamics of conflict; it helps aid workers to develop a better understanding of the context in which they work and their role in that context.
Conflict sensitivity	Awareness of historical, actual or potential conflict, the likelihood of further conflict and its severity; and the capacity to work with all parties to reduce conflict and/or minimize the risk of further conflict.
Contact	A person or animal that has had an opportunity to acquire the infection following association with an infected person or animal or contaminated environment.
Context	All socio-economic and political tensions, root causes and structural factors are relevant to conflict sensitivity because they have the potential to become violent.
Contraceptive Prevalence Rate (CPR)	Percentage of women of reproductive age using a method of family planning. CPR can be narrowed down to married women only or women using a modern method only.
Convenience sampling	Selection of a sample that is nearby, easily reached, e.g. selecting people attending a clinic or those with shelters next to the road, etc. It is very biased.

Coordination	Harmonious and effective working together of people and organisations toward a common goal.
Cope	Behaviour that protects a person from internal or external stress. Examples of healthy coping behaviour: ▪ Reaching out to others for help; ▪ Actively working to find a solution; ▪ Resolving the source of stress; Examples of unhealthy coping behaviour: ▪ Avoiding the source of the threat; ▪ Ignoring the threat; ▪ Denying the effect in order to function normally; ▪ Self-medication, such as heavy drinking, tobacco smoking or other unsafe behaviour.
Counselling	A generic term that is used to cover several guiding and advising processes with the purpose of assisting an individual or group to solve problems, plan for the future etc.
Coverage	The proportion of the target group that has received a service or is protected from a disease or health problem.
Crude birth rate (CBR)	Number of births in a population during a year or other limited time frame divided by the total midyear population or midpoint of the time frame selected.

D

Term	Definition
Defecation fields	Specific areas reserved for defecating that serve to keep people separate from their excreta, most appropriate in arid and semi-arid climates.
Demography	The study of populations, with reference to size, age, structure, density, fertility, mortality, growth and social and economic variables.
Denominator	The lower portion of a fraction. In calculating rate, this number is the total population at risk.
Depression	Generally, a mood state characterised by a sense of inadequacy, a feeling of despondency, a decrease in activity or reactivity, pessimism, sadness and related symptoms.
Determinant	An attribute, variable, or exposure that increases (risk factor) or decreases (protective factor) the occurrence of a specific event.
Disaster	Regardless of the cause, disasters have the following characteristics: ▪ A great or sudden misfortune; ▪ Beyond the normal capacity of the affected community to cope, unaided; ▪ The interface between vulnerable human conditions and a natural hazard.
Domestic violence/intimate partner violence	Physical, sexual and/or emotional violence against a woman that is committed by her husband or other intimate partner.
Drought	Any unusual, prolonged dry period that reduces soil moisture and

	water supplies below the minimum level necessary for sustaining plant, animal, and human life. Droughts occur because of low, sporadic, or late rainfall and as a result of human activities such as deforestation, overgrazing by livestock, erosion, lack of soil conservation, reliance on the cultivation of single cash crops, and traditional farming methods, such as slash and burn.
Drug resistance	The ability of an infectious agent to survive despite the administration of an antimicrobial in a dose equal to or higher than the usual recommended dose.

E

Term	Definition
Early warning indicators	Consists of simple, predictive benchmarks to alert authorities to impending interruptions in food supply and/or access to food.
Ectopic pregnancy	A pregnancy whereby the embryo implants outside the uterus, usually in the fallopian tube.
Effectiveness	The extent to which an organisation is doing the right thing to reach its objectives.
Efficacy	Extent to which a specific intervention, procedure, regimen or service produces a beneficial result to the individual or target population.
Efficiency	The degree to which results (desired outcomes) are achieved without wasting resources. How economically inputs are converted into outputs.
Emergency Contraception	Post-coital mechanisms to inhibit ovulation and implantation.
Emergency phase	▪ Begins when the Crude Mortality Rate (CMR) exceeds twice the baseline rate. Where the baseline CMR is not known the emergency phase begins when the CMR exceeds 1/10,000 people/day; ▪ When the baseline under five mortality rate is unknown, the threshold for the emergency phase in children is 2/10,000/day.
Emerging disease	Newly recognized or newly evolved disease or that has occurred previously but is showing expansion of the geographical, host, or vector range.
Empathy	Identifying with and understanding another person's situation, emotions and feelings.
Endemic	The continuous presence of a disease or infectious agent within a geographical area; the usual prevalence of a disease within such an area.
EPI	Expanded Program on Immunisation.
Epidemic	The occurrence of cases of an illness clearly in excess of what is normally expected. This depends on the specific illness, the season and location. Requires knowledge of previous incidence of the event in the same area.

Glossary

Epidemic or outbreak	The occurrence of cases of an illness with a frequency that is clearly in excess of what is expected in a given region, therefore, demanding emergency control measures.
Epidemic threshold	The minimum number of cases indicating the beginning of an outbreak.
Epidemiology	The study of the distribution and causes of disease in populations as well as its application to the prevention and control of health problems and diseases.
Essential drug list	This list will contain a group of medications used for the common and serious conditions likely to be encountered in the emergency phase. The list of medications may need to be tailored to the specific geographic location and nature of public health emergency.
Evaluation	A process that attempts to determine in a systematic and definitive way the relevance, effectiveness and impact of activities in relation to their objectives. A periodic assessment of the relevance, effectiveness and impact of health interventions against the set objectives. Evaluation is a learning and action-oriented tool that requires the establishment of specific objectives, progress indicators and criteria.
Exposure	Meeting with an infectious agent in a way that may cause disease.

F

Term	Definition
Facility-based health care	Facility-based health care can be established by augmenting the local health care system, setting up a separate health care system or setting up mobile or satellite clinics.
Faecal coliforms	A category of bacteria that match the characteristics of bacteria found in the stool of warm-blooded mammals.
Faecal-oral disease transmission	Occurs when faeces, which contain disease causing pathogens, from one person enters the mouth and is ingested by another person. Factors related to faecal-oral transmission include drinking water contaminated with faecal material (such contamination can occurred at the source, during transport or in the household), poor hygiene due to a lack of water and/or hygienic practices and poor food hygiene (e.g. contamination of food by dirty hands or flies).
Famine	Occurs in a population whose food consumption is reduced to the extent that the population becomes acutely malnourished associated with a rise in mortality.
Fistula	An injury in the birth canal that allows leakage from the bladder or rectum into the vagina, leaving a woman permanently incontinent often leading to isolation and exclusion from the family and community.
Food basket	Consists of food commodities in sufficient quantities to meet a family's basic nutritional requirements and to provide a buffer against shortages or spoilage.

Glossary

G

Term	Definition
Gender-based violence (GBV)	An act of violence that is perpetrated against a person based on socially ascribed differences between females and males. It is commonly used to refer to violence that is directed specifically against a woman because she is a woman or violence which affects women disproportionately. GBV includes sexual violence, domestic violence, trafficking, forced or early marriages and other harmful traditional practices.
Gender roles	The socially constructed roles, behaviour, activities and attributes that a given society considers appropriate for men and women and which affect their opportunities and experiences.
General food ration (GFR)	Food commodities in sufficient quantities to meet a family's basic nutritional requirements and to provide a buffer against shortages or spoilage.
Goal	Ultimate results to which a project is contributing – the impact of a project.
Grief	An emotional reaction to the death of a loved one. It may be expressed in two ways: ▪ Healthy grief: feelings of sadness which diminish over time; missing the loved one but being able to return to normal activities after a reasonable length of time; ▪ Unhealthy grief: feelings of extreme loneliness, overwhelmed by sadness; unable to resume normal activities even after a reasonable period of time.

H

Term	Definition
Haemorrhage	Severe (often difficult to control) bleeding from within the body.
Hazard	Extreme event (natural or man-made) that may disrupt the lives of people, the vulnerable in particular, exposing them to loss of property or livelihood, injury or death.
Health Information System (HIS)	In emergencies, HIS is a set of data collection platforms implemented by a coordinated group of humanitarian actors generating information to support strategic decisions, monitor changes, prioritise action and allocate resources, manage programmes, scaling up or down operations, advocate and formulate concerns in relation to an emergency context.31.
Health services	Includes services provided by the host government, NGOs, mission hospitals, private practitioners, traditional birth attendants and traditional healers.
Host	A person or other living animal that accommodates an infectious agent under normal conditions. The parasite may undergo various developmental stages in the host who may not have symptoms.

Household	All members eating from the same pot or sleeping under one shelter.
Human Immunodeficiency Virus (HIV)	The virus that causes AIDS; it causes a defect in the body's immune system by invading and then multiplying within white blood cells.
Hygiene	In chapter 8, hygiene considers practices related to water hygiene (e.g. keeping water supplies safe), personal hygiene (e.g. washing hands), domestic hygiene (e.g. food hygiene) and environmental hygiene (e.g. keeping household environments free of excreta and solid waste).
Hypothesis	A reasonable statement that is set up to be verified or proved.

Term	Definition
Implementation	Transforming inputs through a set of systems and procedures to produce specified program outputs.
Incidence	The number of new cases, events (illness, death, malnutrition, injury) or attendance that are diagnosed or reported, divided by the total number of persons in a population during a defined period usually one year but shorter for outbreaks. Commonly used for acute, communicable diseases.
Incident Command System (ICS)	A hierarchical structure created to command, control and coordinate an effective emergency response among the various agencies and organisations involved in a disaster. It is designed to organise people and resources and to allocate necessary services to the population in need[6]. It is composed of five major components: ▪ Incident command; ▪ Operations; ▪ Planning; ▪ Logistics; and ▪ Finance.
Incidence rate	The number of new cases diagnosed or reported with a certain disease during a defined time period (usually 1 year) divided by the total population in which the cases occurred.
Incubation period	The interval from the time of infection to the time clinical signs of illness appears.
Index case	A person who acquires a disease through exposure and brings it into a population.
Indicator	A measure that reflects or indicates the state of a defined population, e.g. infant mortality rate. A "signal" that shows whether a standard has been reached. It is used to measure and communicate the result of programs as well as the process or methods used. Indicators can be quantitative or qualitative.
Indoor residual spraying (IRS)	Involves spraying long lasting insecticide on the walls and ceiling of dwellings to kill adult mosquitoes that land and rest on these surfaces. At least 85 percent of dwellings must be sprayed for this method to give mass protection across the community.
Infectious agent	Bacteria, viruses, fungi or parasites or their products that can cause disease.

Glossary

Informed consent	Agreement given freely a person or responsible proxy (e.g. parent) for participation in a study, treatment regimen or vaccination after being notified about the purpose, method, benefit, risks and where relevant, the uncertainty of study outcomes.
Inputs	Resources (staff, supplies, equipment, money, information) needed to carry out project activities in a given time.
Intermediate event	Intermediate events causing temporary displacement include events such as flooding and hurricanes and even armed conflict. In these events, people expect to return to their homes and lives within several weeks to several months.
Internally Displaced Person (IDP)	▪ Persons forced to flee their homes suddenly or unexpectedly in large numbers, as a result of armed conflict, internal strife, systematic violations of human rights, natural or man-made disasters and who are within their own country's territory (UN Secretary General 1992). ▪ Persons or groups of persons forced or obliged to leave their homes or places of habitual residence, in particular as a result of, or in order to avoid the effects of, armed conflict, situations of generalized violence, violations of human rights, or natural human-made disasters, and who have not crossed an internationally recognized state border (Inter-Agency Standing Committee Guiding Principles 1998).
Isolation	Keeping infected persons or animals in separate places or under certain conditions for as long as they can transmit disease. This prevents or limits the direct or indirect transmission of the infectious agent to those who are susceptible to infection.

K

Term	Definition
Kwashiorkor	Severe acute malnutrition indicated by the presence of edema of both feet.

L

Term	Definition
Leader	Someone who inspires people to face challenges in order to achieve the desired results.
Logistics cycle	The logistics cycle of drug management includes the selection, procurement, distribution, and use of drugs.
Low birth weight	Birth weight under 2.5 kg, an indicator of maternal underweight before and during pregnancy and increased risk of infant mortality.

M

Term	Definition
Malaria	Person with onset of fever or history of fever within the past 48 hours (with or without other symptoms such as nausea, vomiting and diarrhoea, headache, back pain, chills, muscle pain) with positive laboratory test for malaria parasites (blood film (thick or thin smear) or rapid diagnostic test). **In children** - Uncomplicated malaria - Fever AND no general danger signs such as lethargy or unconsciousness, convulsions, or inability to eat or drink. Where possible, confirm malaria with laboratory test in children aged >5 years. Severe malaria - Fever AND general danger signs (lethargy or unconsciousness, convulsions, or inability to eat or drink).
Management	Searching for the best use of resources in pursuit of objectives subject to change (Keeling).[4]
Maramus	Severe acute malnutrition indicated by severe wasting.
Mass Casualty Incident (MCI)	Any event in which the needs of a large number of victims disrupt the normal capabilities of the local health service.
Mass displacement	An emergency such as refugees fleeing from a neighbouring country or internally displaced persons such as those in Northern Uganda, with potentially longer term needs for a select population.
Mass event	An emergency that my have long-term or immediate health effects on the health system. Mass events with long-term implication include disasters such as earthquakes and tsunamis. Mass events with immediate implications may be caused by a bus or train or plane crash, biological warfare, fire or explosive incident, or a localised natural disaster.
Maternal mortality	The death of a woman while pregnant or within forty-two days of termination of pregnancy (by birth, abortion or miscarriage) due to complications from the pregnancy, delivery or management of either, or due to existing medical conditions that were aggravated by the pregnancy or delivery.[1]
Maternal mortality rate	The number of maternal deaths per 100,000 women of reproductive age.
Maternal mortality ratio	The number of maternal deaths per 100,000 births.
Mean	Commonly called the average. Calculated by adding the individual values in a group of measurements and dividing the total by the number of values.
Means of verification	Information or data required to assess progress against set indicators and their sources.
Measles	Fever and maculopapular rash (i.e. non-vesicular) and cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes). or Any person in whom a clinical health worker suspects measles infection. To confirm a case of measles: Presence of measles-specific IgM antibodies.

Glossary

Median	The central value in a range of measurements that divides the data set into two equal parts.
Meningitis	**Suspected case** - Sudden onset of fever (>38.5 °C) with stiff neck. In patients aged <12 months, a suspected case of meningitis occurs when fever is accompanied by a bulging fontanels. **Probable case of bacterial meningitis** - Suspected case of acute meningitis, as defined above, with turbid cerebrospinal fluid. **Probable case of meningococcal meningitis** - Suspected case of meningitis, as defined above and gram stain showing gram-negative diplococcus or ongoing epidemic or petechial or purpural rash.To confirm a case of meningococcal meningitis Suspected or probable case, as defined above, with either positive-CSF antigen detection for *Neisseria meningitidis* or positive CSF culture or blood with identification of *N. meningitidis*.
Methods	Sequence of tasks or activities for achieving objectives.
Mid-Upper-Arm Circumference (MUAC)	A measure of fat and muscle in the mid-upper arm, which can be used for rapid assessments and screening.
Midwife	A skilled birth attendant who has received sufficient training to diagnose and manage complications during childbirth as well as to assist normal deliveries. Generally, midwives are able to handle basic obstetric problems but will refer more serious complications to a physician.
Minimum standard	The minimum acceptable level (of service) to be attained in humanitarian assistance.
Mode	The most frequently occurring value in a set of observations.
Monitoring	An ongoing process of checking the progress of activities against the plan to ensure that all processes are going on as intended.
Morbidity	An incidence rate used to include all persons in the population under consideration (e.g. specific gender or age group) who become clinically ill during the stated time period. Any departure from the state of physiological or psychological well-being; synonymous with sickness or illness. Measured in terms of all persons within a given population who become ill during a specific time period, by types of illnesses.
Mortality (death rate)	The number of deaths occurring in a population in a stated period usually a year divided by the number of persons at risk of dying during that period. Crude mortality rate: covers deaths from all causes; death-specific mortality rate: covers death due to only one disease.

N

Term	Definition
NGO	Non-governmental organisation; may also be referred to as private voluntary agency, civil society organisation or non-profit organisation.
Normalcy	The state or fact of being normal.

Normality	The state or condition that is collectively acknowledged by a society as the status quo.
Notifiable disease	Disease for which regular, frequent, and timely information on individual cases is considered necessary for the prevention and control of the disease.
Numerator	The upper portion of a fraction. In the rate, all people included in the numerator should be included in the denominator. This is not true for the numerator in a ratio.
Nutrition emergency	Exists when there is the risk of or an actual rise in mortality due to acute malnutrition.

O

Term	Definition
Objective	The intended, measurable results (outcomes) of a program; the specific targets or positions that are to be reached in order to achieve the overall goal.
Outputs	The intended results of project activities – used as milestones to assess what has been accomplished at various stages during the life of the project.

P

Term	Definition
Parallel health system	Two or more separate systems for providing health services. In the case of emergencies, relief programmes may find it necessary to set up temporary parallel health systems outside of the local health system. However, it is recommended to strengthen the local health system when possible.
Participatory approaches	Program approaches that give community members the opportunity to build and strengthen problem-solving skills and empowers them to take action.
Pellagra	Caused by niacin (vitamin B_3) deficiency and occurs among populations that consume maize (corn) as the staple cereal. Clinical signs are dementia, diarrhoea, and dermatosis of exposed skin.
Peripheral level of clinical care	Health facilities such as a dispensary or health post where community trained health workers offer a limited range of ambulatory care including treatment of minor injuries/ailments, immunisation, and referral of more complex cases.
Pit latrines	The most commonly selected sanitation option for displaced populations is the pit latrine. A pit latrine is a wide hole in the ground covered by a platform with a squat hole to defecate through.
Planning	A continued process of anticipating the resources and services required to achieve objectives determined according to an order of priorities that permits the selection of the optimal solution or solutions

Glossary

	from among several alternatives; these choices take account of the context of internal and external constraints, whether already known or foreseeable in the future. (Pineault) The core of planning consists of analysing alternative means of moving toward identified goals in the light of priorities and existing constraints[15].
Population	The total number of inhabitants or particular groups in a defined area or country. In sampling, population refers to the units from which a sample is drawn.
Population pyramid	A graphical presentation of the age and sex composition of a population. A typical pyramid for developing countries has a broad base, sloping sides and a narrow apex that is due to high fertility rate and high mortality at younger ages.
Post-emergency phase	Begins when the Crude Mortality Rate (CMR) drops below and may last one to six months or longer. Characterized by improvement and expansion of relief activities.
Post traumatic stress disorder (PTSD)	A disorder that emerges following a psychologically distressing traumatic event such as a natural disaster, a bad accident, exposure to war or rape; the syndrome includes re-experiencing the trauma in dreams, recurrent thoughts and images, numbness and hyper-vigilance and an exaggerated startle response. After six months the disorder is said to be chronic.
Pot chlorination	Pot chlorination involves filling a vessel (usually a 1-liter plastic bottle with a few holes punched in it) with a chlorine powder and gravel mixture. This is then placed in a larger vessel (such as a 4-liter milk jug or a clay pot) which also has a few holes punched in it. The chlorine disperses from the double-layered pot slowly. The number and size of holes determines the dose of chlorine released into the well. The pot chlorination method protects against a continuous source of contamination in the groundwater.
Pour flush latrines	A pour flush toilet is a basin with a water trap at the bottom and a pipe to carry sewage to a soak-away pit or sewer. Such designs are not generally used in emergencies because they use large amounts of water and require a sewage collection system that is expensive and time consuming to build.
Prevalence	The total number of persons sick or showing a certain condition in a stated population at a particular time regardless of when it began, divided by the population at risk. Point prevalence measures the proportion at a particular point in time; period prevalence measures the proportion within a defined period of time.
Prevention	Acts aimed at eradicating, eliminating or minimizing the impact of disease and disability: ▪ Primary prevention: aims to reduce incidence by preventing transmission. ▪ Secondary prevention: aims to reduce prevalence by shortening duration. ▪ Tertiary prevention: aims to reduce the number and/or impact of disease complications.
Primary or index case	A person who acquires a disease through exposure and brings it into a population.
Primary prevention	The ultimate goal of preventive health care. It prevents the *transmission* of disease to populations that are generally healthy.

Probability sampling	Uses the probability theory to select a specified number of persons for study so that every member in the target population has the same known and non-zero chance of being included. Provides a demonstrable degree of reliability.
Process	The steps or tasks for carrying out activities (diagnosing, counselling, referral, etc.).
Programme	An organised set of projects or services seeking to attain specific (usually similar/related) objectives. A proposed plan with a medium to long-term horizon (possibly without a defined end) and often having strategic objectives, multiple projects and activities.
Project	A planned scheme aimed at achieving specific objectives within a given time/budget. A set of time-bound activities typically contributing to a larger programmatic objective, which are planned, implemented, monitored and evaluated in relation to the issue(s) that they seek to address.
Proportion	A ratio where the numerator (x) is part of the denominator (y). Expressed as x/y.
Protective factors	Qualities in people or the world around them that shield them from the full force of a stressor.
Psychosis	Losing touch with reality. It can range in severity from mild distortions of reality to hearing or seeing things that are not there.
Purpose	The change that occurs if project outputs are achieved – the effect of a project.

R

Term	Definition
Random sample	A selected subset of the population derived by random selection of sample units. Each individual unit (village, household or person) should have an equal chance of being included in the sample.
Rape	Generally refers to sexual intercourse with another person (male or female) without that person's consent. Legal definitions of rape will vary and depend on the nature of the relationship between the perpetrator and the victim, the act perpetrated and other factors.
Rate	The likelihood that a particular event will occur in a specified period. Expressed as x/y x factor (e.g., 1000).
Ratio	The relationship between two quantities, represented by x and y. Expressed as x/ y or x:y (x need not be part of y).
Reconstruction (rehabilitation) Phase	After the relief phase, reconstruction begins. This should lead to the restoration of pre-disaster conditions (repaired facilities, functioning services, self-reliance etc).
Recovery phase	▪ Recovery phase indicates the period during which normal activities are resumed; ▪ This may be divided into categories such as economic recovery, psychological recovery, recovery of livelihood, and recovery of physical losses.

Glossary

Referral level of clinical care	Health facilities, such as a district hospital, with the capacity to manage first referral cases but for limited medical disciplines including emergency surgical and obstetric care, follow up, inpatient, and rehabilitative care. Facilities include laboratory, blood bank, and x-ray services.
Refugee	■ Any person who, owing to a well-founded fear of persecution for reasons of race, religion, nationality, membership of a particular social group or political opinion is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it (UNHCR 1951); ■ every person who, owing to external aggression, occupation, foreign domination, or events seriously disturbing public order in either part of or the whole of his country of origin or nationality, is compelled to leave his place of habitual residence in order to seek refuge in another place outside his country of origin or nationality (OAU).
Relapse	Reappearance of clinical symptoms and infection separated by an interval greater than that related to normal periodicity.
Relief	Assistance given to people in need after a disaster. The initial assistance in an emergency is usually the provision of food, clean water, shelter and protection.
Repatriation	Returning to the country of birth or citizenship. It may be forced or voluntary.
Representative sample	A selected subset of a population that resembles the original or reference population in every way.
Reservoir	Any person, animal, arthropod, plant soil, etc. in which the infectious agent normally lives and reproduces itself in such a manner that it can be transmitted to a susceptible host.
Resistance	Ability of a parasite or organism to multiply or survive in presence of drug concentrations that are normally lethal and destroy or prevent multiplication of most organisms of the same species.
Results	Outcomes of processes and necessary inputs for the target population as: ■ Outputs — Direct results (products or services) a program delivers to a target population to produce the expected impacts. ■ Effects — Changes in knowledge, attitudes, behaviour/practice, coverage resulting from the output. ■ Impacts — Changes in health status (morbidity, mortality, disability, fertility) resulting from the output.

S

Term	Definition
Sampling	Selection of a specified number of persons in a population for study with the hope that they are representative of the entire population.
Sanitation	In this chapter, sanitation considers excreta disposal, vector control, solid and medical waste management and drainage.
Scurvy	Caused by vitamin C deficiency. Clinical signs are poor wound healing, bleeding gums, fatigue, leg pain, and a rash on the legs.
Secondary case	A person infected by the primary case.
Secondary prevention	The early identification and treatment of a diseased person to prevent the infection from progressing to a more serious complication or death.
Sensitivity	The proportion of true positives correctly identified by a screening test.
Severe acute malnutrition	Marasmus or kwashiorkor.
Sexual abuse	Actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.
Sexual exploitation	Actual or attempted abuse of a position of vulnerability, differential power or trust for sexual purposes, including, but not limited to profiting monetarily, socially or politically from the sexual exploitation of another.
Sexually Transmitted Disease/Infection (STI/STI)	Any disease that is communicated primarily or exclusively through intimate sexual contact; can cause infertility through miscarriage, prenatal deaths, and damage to male and female reproductive systems.
Sexual violence	Covers all forms of sexual threat, assault, interference and exploitation including statutory rape and molestation without physical harm or penetration.
Shock chlorination	Shock chlorination is conducted by adding 5-10 mg/l of chlorine solution to water in a well and allowing it to sit unused for a number of hours. The first water drawn from the well after the disinfection period is discarded. Normal use of the well can then be resumed.
Social support	All forms of support provided by other individuals and groups that help others to cope. A network of people that one trusts and seeks help from including family and extended family, neighbours, friends, religious leaders, teachers etc.
Somatisation	An emotional state that affects how a person feels physically. Anxiety or depression might appear as fatigue, gastrointestinal complaints, headache, cardiac symptoms, diffuse aches and pains, muscular and joint problems, or sexual dysfunction.
Specificity	The proportion of true negatives correctly identified by a screening test.

Glossary

Staffing	Planning for the types and number of personnel that will be required.
Standard deviation	A measure of the dispersion or variation of a set of quantitative measurements on either side of the mean.
Standard case management	Standard case management procedures must be established to prevent unnecessary treatment or investigations and wastage of limited resources (drugs, staff time, etc.). These procedures include: ▪ Standard diagnostic protocols and case definitions; ▪ Standard investigative procedure; ▪ Standard treatment protocols; ▪ Standard admission criteria; and ▪ Standard referral criteria.
Standard health cards	Health cards or exercise books for each patient that are introduced and kept either at the registration office or by each family. These will help following-up patients as well as in monitoring the quality of health care.
Strategy	The order of pursuing priorities and objectives based on relative effectiveness and consideration of constraints.
Stressor	A factor that adds to people's stress, e.g. loss of family or home, lack of food etc
Supervision	Promoting efficient, effective and equitable health care by meeting staff needs for management support, logistics, training and continuing education.
Surveillance	Ongoing, systematic collection, analysis and interpretation of health data for managers of public health programmes combined with feedback to all. Systematic collection, collation, and analysis of data and dissemination of resulting information so that action can result.
Survey	Periodic, focused assessments that collect health data from a population.
Survivor/victim	In this chapter, used interchangeably to refer to a person who has experienced gender-based violence.
Susceptible host	Person or animal not possessing sufficient resistance against a particular infectious agent to prevent contracting infection or disease when exposed to it.
Suspected cholera	In an area where cholera is not known to be present: a person aged >5 years with severe dehydration or death from acute watery diarrhoea with or without vomiting. In an area where there is a cholera outbreak: a person aged >5 years with acute watery diarrhoea with or without vomiting. To confirm a case of cholera: Isolation of *Vibrio cholera* O1 or O139 from a diarrhoeal stool sample.
Sustainability	Continuity of a program beyond termination of donor support due to increased local capacity. Different donors may define it differently, but all consider sustainability vital and push for it.
Systematic sampling	A sampling method that uses a list to select after randomly picking the first unit additional units at regular intervals.

T

Term	Definition
Target group	A family, specific population group, or a community in a defined area of a country.
Targeted supplementary feeding	Supplementary feeding to prevent severe acute malnutrition among the moderately malnourished and limit the need for therapeutic feeding.
Tetanus	**Adult tetanus***:* Either of the following signs 3–21 days following an injury or wound: ▪ trismus of the facial muscles or risus sardonicus ▪ painful muscular contractions. **Neonatal tetanus***:* Any neonate with normal ability to suck and cry during the first 2 days of life who, between day 3 and day 28, cannot suck normally, or any neonate who becomes stiff or has spasms or both.
Tertiary prevention	Aims to reduce permanent damage from disease such as a patient offered rehabilitative services to lessen the effects of paralysis due to polio or land mine injuries).
Traditional birth attendant (TBA)	A community-based birth attendant who, with limited formal training, provides basic prenatal, delivery and postnatal care. Although not trained to manage complications of pregnancy and childbirth, traditional birth attendants provide important referral services for problem cases.
Training	Transferring specific skills and competencies to individuals about to do a particular job.
Transmission	Any mechanism by which an infectious agent is spread from a source or reservoir to a person: ▪ Direct transmission — immediate transfer of infectious agents to a suitable portal of entry through which infection of a human or animal may take place (direct contact or projection). ▪ Indirect transmission — transfer of infectious agents through intermediate means: e.g., vehicle-borne (contaminated materials), vector-borne (arthropods).
Trauma	From the Greek word for *wound*, a term used freely to describe either physical or psychological injury caused by some extreme emotional event.
Trench latrine	A communal type of latrine often used when sanitation facilities are needed quickly and defecation fields are not appropriate. This latrine is simply a trench measuring about 0.5 to 1m in depth and width, and of varying length.
Trend	A long-term change in frequency, either upward or downward. A downward trend in a disease implies it is becoming less frequent.
Triage	In a disaster medical response, triage adopts the method of sorting and prioritising victims for medical attention according to the degree of injury or illness and expectations for survival. Triage is carried out to reduce the burden on health facilities.
Turbidity	A measure of water clarity.

U

Term	Definition
Unexplained cluster of health events	An aggregation of cases with similar symptoms and signs of unknown cause that are closely grouped in time and/or place.
Unexplained fever	Fever (body temperature >38.5 °C) for >48 hours and without other known aetiology.
Universal precautions	Simple, standard procedures to be used during the care of patients at all times to minimize the risk of transmission of blood-borne viruses, including HIV. They consist of hand washing, use of protective clothing such as gloves; safe handling of sharp instruments; safe disposal of medical waste include sharps; and decontamination of instruments and equipment.
Unmet need for contraception	A measure based on the number of women of reproductive age and in a sexual union who report that they want to postpone or avoid childbearing and also report that they and their partner are not using contraception.
Utilisation rates	Utilisation rates are given in terms of visits to a health facility per person per year: $$\frac{\text{Total number of visits in one week}}{\text{Total population x 52 weeks}} = \text{visits/person/year}$$ These rates are not constant and may vary based on phase of the emergency, population demographics, season, etc. Utilisation rates generally increase among displaced populations and populations affected by other public health emergencies.

V

Term	Definition
Validity	The degree to which a measurement actually measures what it is supposed to.
Variable	Any characteristic that can be measured (e.g., age, weight) or categorised (e.g., sex, marital status).
Vector	Any animal capable of transmitting disease pathogens from one host to another by its bite or bodily functions. Pathogens can be transmitted either mechanically (e.g., trachoma which is transmitted by non-biting flies) or after biological transformation (e.g., malaria parasites by mosquitoes).
Vector control	Any measures directed against a vector of disease and intended to limit its ability to transmit disease.
Vector-related diseases	Occur when vectors carrying disease pathogens from an animal, human, etc. (reservoir) to another.
Vertical programme	A term used very widely and loosely to indicate independent programs for either specific health issues or directed by staff who barely communicate or know one another.

Glossary

Virulence	The ability of an infectious agent to invade and damage tissues of the host and/or cause death.
Vulnerable groups	Those individuals at greatest risk of disease or injury.
Vulnerability	The degree of defencelessness, insecurity and exposure to risks, shock, stress and having difficulty coping with them. Living on an 'edge' such that if something goes wrong or if part of the situation changes, then the ability to sustain life is endangered. The potential is that when something destructive happens, people will not be able to handle the consequences by themselves.

W

Term	Definition
Weight-for-height z – score	The weight and height of the child compared to the median and standard deviation of the reference weight for the child's height; used to analyse and report nutrition survey rates.
Women of reproductive age	Women between the ages of fifteen to forty-four or fifteen to forty-nine depending on the childbearing trends of the population in question for the purposes of demographic statistics. It is often used as the denominator in reproductive health demographic measures.

X

Term	Definition
Weight-for-Xerophthalmia	Caused by vitamin A deficiency. Clinical signs are night blindness, corneal lesions, and nutritional blindness and increased childhood morbidity and mortality, particularly from measles and diarrhoea. Young children and pregnant women are especially vulnerable.

Z

Term	Definition
Zoonotic diseases	Those diseases and infections that are naturally transmitted between nonhuman vertebrate animals and humans.

The International Federation's Global Agenda (2006–2010)

Over the next five years, the collective focus of the Federation will be on achieving the following goals and priorities:

Our goals

Goal 1: Reduce the number of deaths, injuries and impact from disasters.

Goal 2: Reduce the number of deaths, illnesses and impact from diseases and public health emergencies.

Goal 3: Increase local community, civil society and Red Cross Red Crescent capacity to address the most urgent situations of vulnerability.

Goal 4: Promote respect for diversity and human dignity, and reduce intolerance, discrimination and social exclusion.

Our priorities

Improving our local, regional and international capacity to respond to disasters and public health emergencies.

Scaling up our actions with vulnerable communities in health promotion, disease prevention and disaster risk reduction.

Increasing significantly our HIV/AIDS programming and advocacy.

Renewing our advocacy on priority humanitarian issues, especially fighting intolerance, stigma and discrimination, and promoting disaster risk reduction.

The Fundamental Principles of the International Red Cross and Red Crescent Movement

Humanity
The International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavours, in its international and national capacity, to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace amongst all peoples.

Impartiality
It makes no discrimination as to nationality, race, religious beliefs, class or political opinions. It endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress.

Neutrality
In order to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious or ideological nature.

Independence
The Movement is independent. The National Societies, while auxiliaries in the humanitarian services of their governments and subject to the laws of their respective countries, must always maintain their autonomy so that they may be able at all times to act in accordance with the principles of the Movement.

Voluntary service
It is a voluntary relief movement not prompted in any manner by desire for gain.

Unity
There can be only one Red Cross or Red Crescent Society in any one country. It must be open to all. It must carry on its humanitarian work throughout its territory.

Universality
The International Red Cross and Red Crescent Movement, in which all societies have equal status and share equal responsibilities and duties in helping each other, is worldwide.

**Together for
humanity**