MONITORING UPDATE

Self-Reported Diarrhea Tracking

+

Water Quality Analysis

WASH Program
Sittwe Township
Rakhine State, Myanmar

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Diarrhea Tracking in Emergencies

Why should WASH agencies undertake something that is traditionally a health sector activity?

- Data can be used to compliment and cross-check existing surveillance data

- To provide informational support to areas that are under-served by existing surveillance systems

- Real-time early warning system for AWD/ Cholera outbreaks in high risk areas

- To be used in for targeting and messaging for hygiene promotion programming

- WASH partners tend to have large outreach teams already present in intervention areas, making data collection a simple part of outreach work

- To be used as impact indicators in project evaluation

Diarrhea Tracking in Emergencies

What does this require?

- Trained field staff or volunteers from the community

- Rigorous methodology and data collection procedures

- Full understanding of potential errors and basic assumptions

- Sound statistical model that can account for potential errors

- Community awareness about the tracking and how they should report diarrhea

- Capacity to process the data on a frequent basis

SI Methodology for Diarrhea Tracking

Data Collection

- Staff are trained on the clinical definition of diarrhea (3 or more loose or watery stools in a 24 period) and how to identify this in a survey

    - The Bristol Stool Chart is used to help clarify the description of diarrhea to respondents

- An <u>intermittent data collection</u> method is used (versus a continuous method).

    - The survey is conducted on 7 day intervals (once per week, the same day every week)

    - This is due to the assumption that a diarrhea episode duration is on average 3-7 days. In this way we are able to calculate the *incidence rate* (more on this later)

    - Survey is conducted as a random <u>household</u> survey. All members household are included in the population of the sampling.

    - The adult male or female present at the time of the survey are asked the question **"Have you or anyone else in your household had diarrhea in the past 7 days?"** We assume that the adults either male or female are aware of episodes of diarrhea from all members of the family.

    - The enumerator records the number of cases of diarrhea into the correct demographic.

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SI Methodology for Diarrhea Tracking

Statistic Model and Analysis

- <u>Sample Size:</u> Target is 10% of the population during non-outbreak periods

  - During outbreaks this could be increased to increase the confidence

- <u>Reporting Intervals</u>: weekly

- <u>Stratified data</u>: Two main demographics

  - Under 5/ Over 5

  - male/ female

- <u>Measurement of risk</u>

  - *Incidence rate* is used which is the number of new cases within a specified time period divided by the size of the population initially at risk

  - Weekly incidence rates for "Under 5" and "Over 5" and then a more general "case per 1000"

SI Methodology for Diarrhea Tracking

Types of Error

- <u>Reporting error:</u> the respondent provides incorrect information about themselves or someone in their household

- <u>Recall error:</u> the respondent provides an incorrect answer because the recall duration is wrong

- <u>Reporting bias:</u> enumerators intentionally or unintentionally influence the results of the survey

- <u>Hawthorne effect/ observer effect:</u> individuals modify their behavior in response to their awareness of being observed. This is also related to reporting fatigue

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Tracking Database

Start date of week (mm/dd/yy)	Month	Epi Week	Year	Camp	Sample Size	Under 5 Male	Under 5 Female	Over 5 Male	Over 5 Female	Under 5 Male %	Under 5 Female %	Under 5 Total	Over 5 Male %	Over 5 Female %	Over 5 Total %	Cases per 1000
10-Jun-14	Jun	24	2014	Baw Du Pha Camp	790	2	11	4	19	3%	16%	10%	1%	6%	3%	45.57
10-Jun-14	Jun	24	2014	Dar Paing Camp	1172	10	34	7	23	11%	34%	23%	1%	5%	3%	63.14
10-Jun-14	Jun	24	2014	Thae Chaung Camp	590	7	19	8	28	15%	38%	27%	3%	11%	7%	105.08
10-Jun-14	Jun	24	2014	Hman Zi Camp	216	3	2	0	7	17%	11%	14%	0%	8%	4%	55.56
17-Jun-14	Jun	25	2014	Baw Du Pha Camp	492	1	2	2	12	3%	5%	4%	1%	6%	3%	34.55
17-Jun-14	Jun	25	2014	Hman Zi Camp	250	0	8	0	8	0%	38%	19%	0%	7%	4%	64.00
17-Jun-14	Jun	25	2014	Dar Paing Camp	1207	8	38	5	24	8%	37%	23%	1%	5%	3%	62.14
17-Jun-14	Jun	25	2014	Thae Chaung Camp	609	31	30	16	18	63%	58%	60%	6%	7%	7%	155.99
24-Jun-14	Jun	26	2014	Baw Du Pha Camp	1780	3	13	10	12	2%	9%	5%	1%	2%	1%	21.35
24-Jun-14	Jun	26	2014	Hman Zi Camp	229	0	1	2	3	0%	5%	3%	2%	3%	3%	26.20
24-Jun-14	Jun	26	2014	Dar Paing Camp	1138	23	23	19	9	25%	24%	24%	4%	2%	3%	65.03
24-Jun-14	Jun	26	2014	Thae Chaung Camp	621	2	9	6	10	4%	17%	11%	2%	4%	3%	43.48
1-Jul-14	Jul	27	2014	Baw Du Pha Camp	1290	9	3	6	6	9%	3%	6%	1%	1%	1%	18.60
1-Jul-14	Jul	27	2014	Hman Zi Camp	231	2	0	0	0	11%	0%	5%	0%	0%	0%	8.66
1-Jul-14	Jul	27	2014	Dar Paing Camp	1149	6	5	8	3	6%	5%	6%	2%	1%	1%	19.15
1-Jul-14	Jul	27	2014	Thae Chaung Camp	541	5	8	5	7	11%	17%	14%	2%	3%	3%	46.21
8-Jul-14	Jul	28	2014	Baw Du Pha Camp	1271	4	7	2	6	4%	6%	5%	0%	1%	1%	14.95
8-Jul-14	Jul	28	2014	Hman Zi Camp	231	1	0	1	0	5%	0%	3%	1%	0%	1%	8.66
8-Jul-14	Jul	28	2014	Dar Paing Camp	1141	5	6	9	8	5%	6%	6%	2%	2%	2%	24.54
8-Jul-14	Jul	28	2014	Thae Chaung Camp	628	10	3	4	11	20%	6%	12%	2%	4%	3%	44.59
15-Jul-14	Jul	29	2014	Baw Du Pha Camp	1283	9	1	0	6	9%	1%	5%	0%	1%	1%	12.47
15-Jul-14	Jul	29	2014	Hman Zi Camp	219	0	1	1	0	0%	5%	3%	1%	0%	1%	9.13
15-Jul-14	Jul	29	2014	Dar Paing Camp	1168	6	8	2	4	6%	8%	7%	0%	1%	1%	17.12
15-Jul-14	Jul	29	2014	Thae Chaung Camp	671	9	7	3	7	17%	12%	14%	1%	2%	2%	38.75
22-Jul-14	Jul	30	2014	Baw Du Pha Camp	1282	5	5	3	3	5%	5%	5%	1%	1%	1%	12.48
22-Jul-14	Jul	30	2014	Hman Zi Camp	232	0	0	0	1	0%	0%	0%	0%	1%	1%	4.31
22-Jul-14	Jul	30	2014	Dar Paing Camp	1203	7	3	1	3	7%	3%	5%	0%	1%	0%	11.64
22-Jul-14	Jul	30	2014	Thae Chaung Camp	595	5	3	5	3	10%	6%	8%	2%	1%	2%	26.89

Automatic Calculations

Incidence Rates - Automatic Calculations
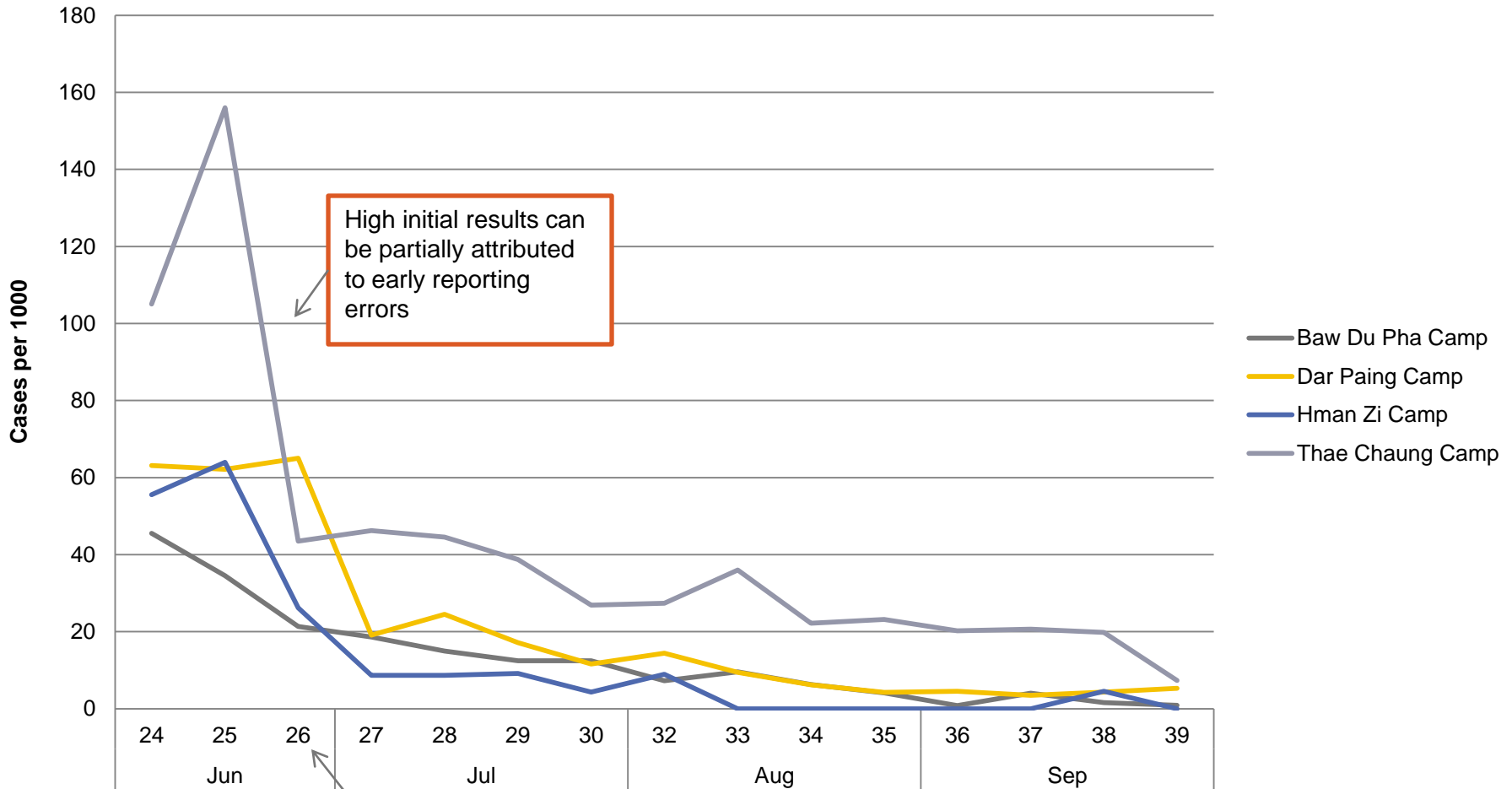
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Results

- Diarrhea Tracking has been ongoing in 4 SI camps for approximately 4 months – June to September

    - Thae Chaung

    - Dar Paing

    - Baw Du Pah

    - Hmunzi (Kaung Doke Kar 2)

- Week 24-26 pilot (June)

- Retraining of enumerators was completed after pilot to reduce potential errors

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Results

Diarrhea cases per 1000
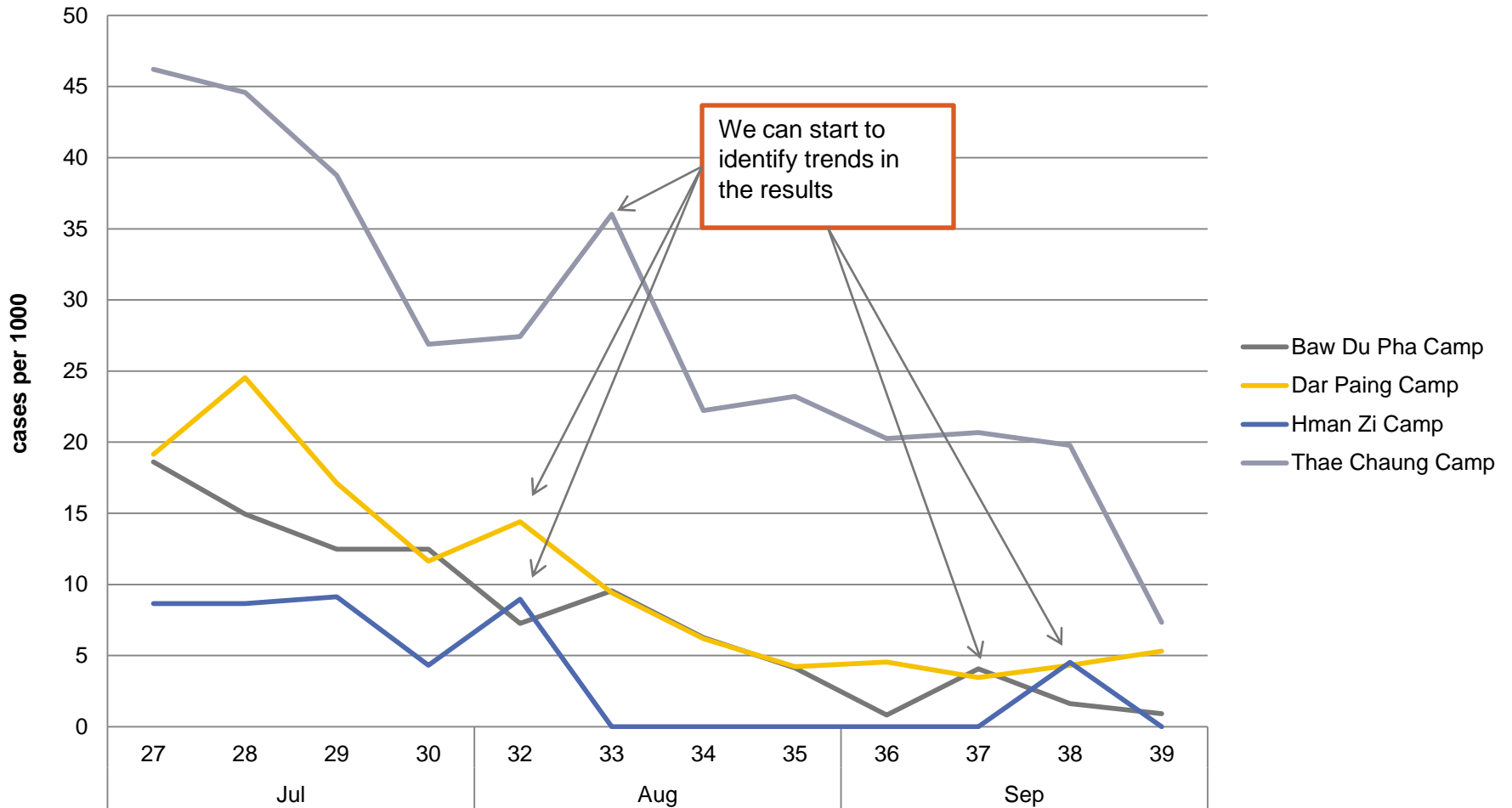

High initial results can be partially attributed to early reporting errors
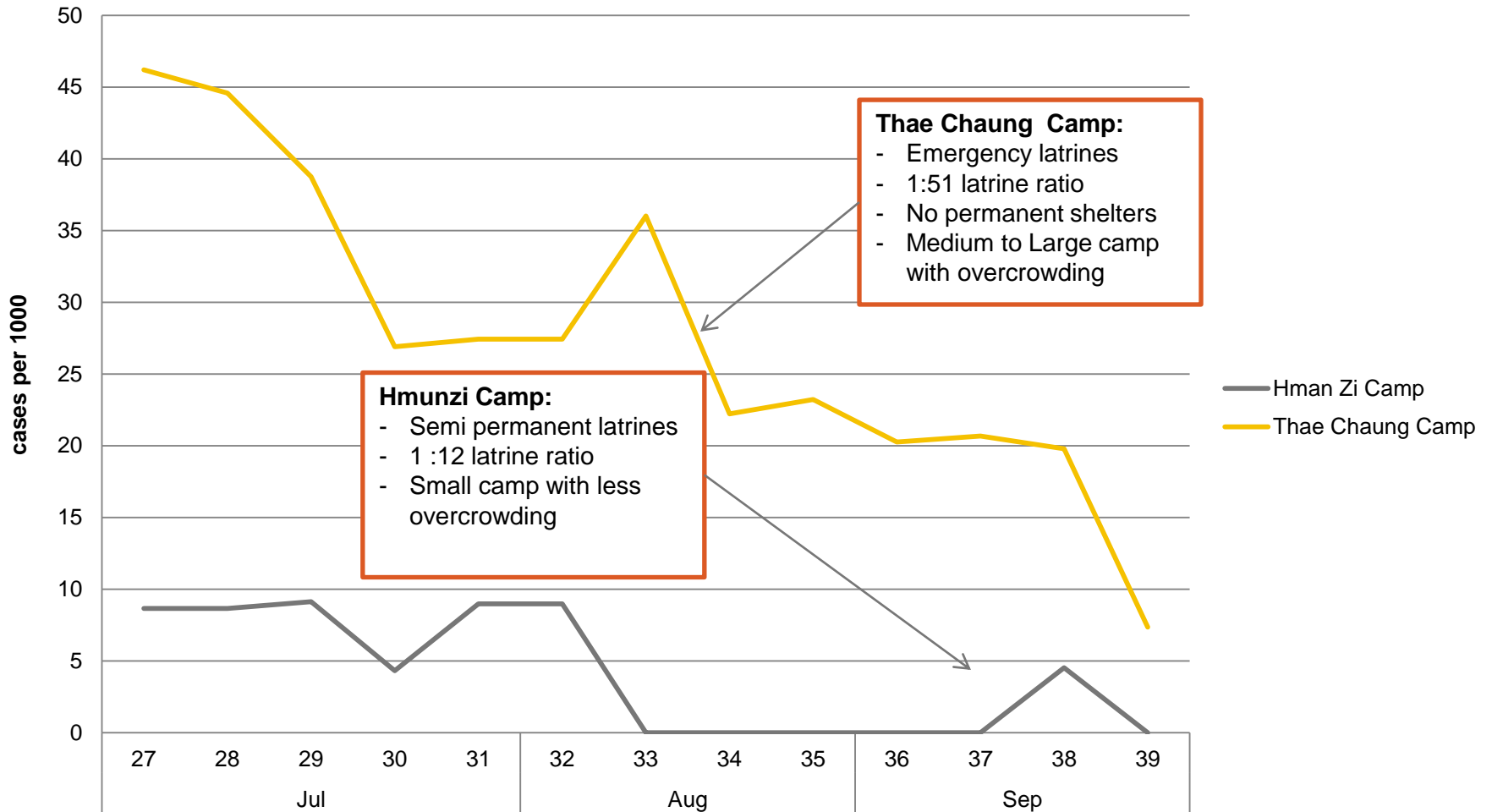
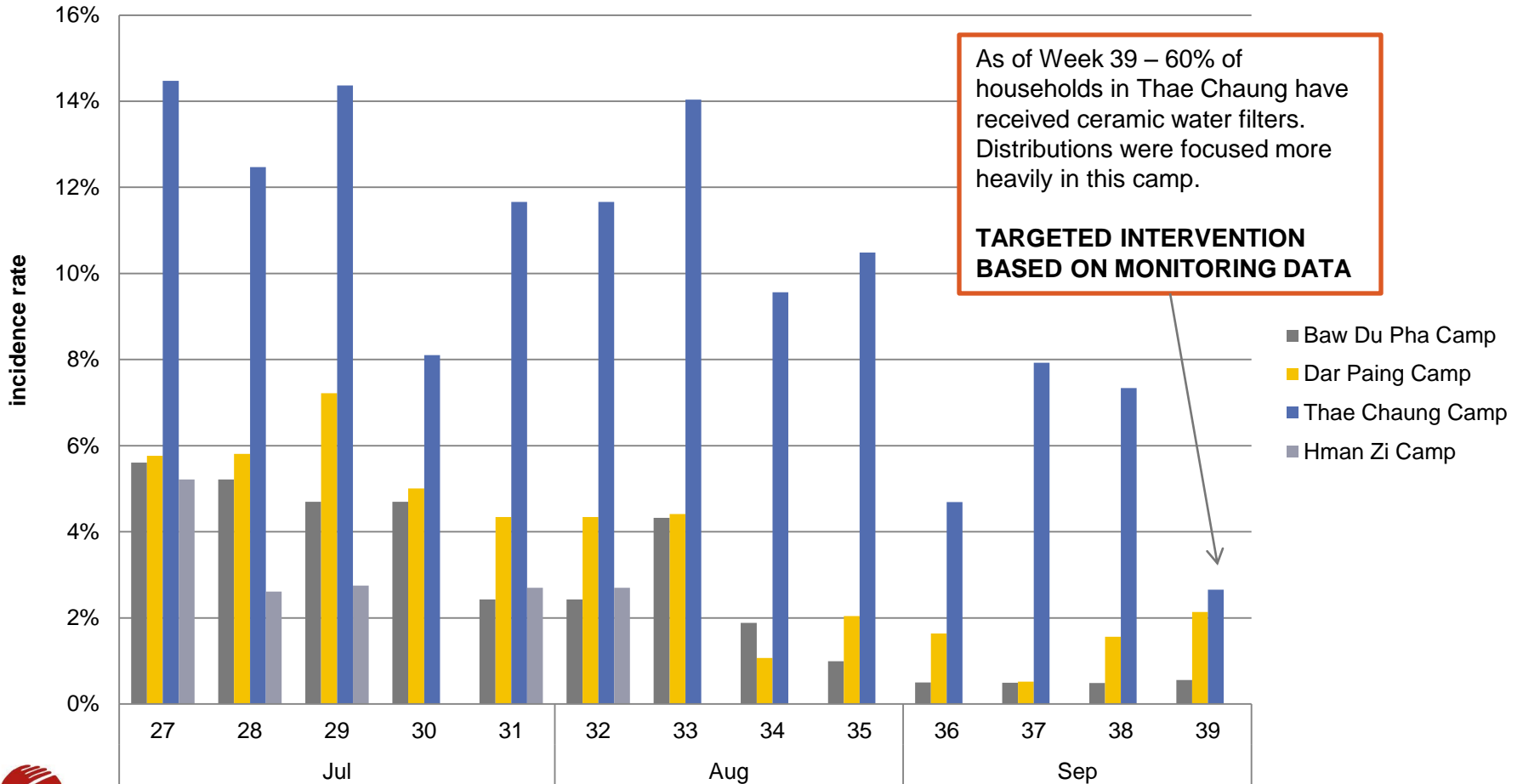Retraining of enumerators in week 26

Results

Diarrhea cases per 1000

We can start to identify trends in the results

Legend:
- Baw Du Pha Camp
- Dar Paing Camp
- Hman Zi Camp
- Thae Chaung Camp

Results

Diarrhea cases per 1000

Thae Chaung Camp:
- Emergency latrines
- 1:51 latrine ratio
- No permanent shelters
- Medium to Large camp with overcrowding

Hmunzi Camp:
- Semi permanent latrines
- 1 :12 latrine ratio
- Small camp with less overcrowding

Legend:
Hman Zi Camp
Thae Chaung Camp

Results

weekly incidence rate
Under 5

As of Week 39 – 60% of households in Thae Chaung have received ceramic water filters. Distributions were focused more heavily in this camp.

TARGETED INTERVENTION BASED ON MONITORING DATA

Legend:
- Baw Du Pha Camp
- Dar Paing Camp
- Thae Chaung Camp
- Hman Zi Camp

Results

weekly incidence rate
Over 5
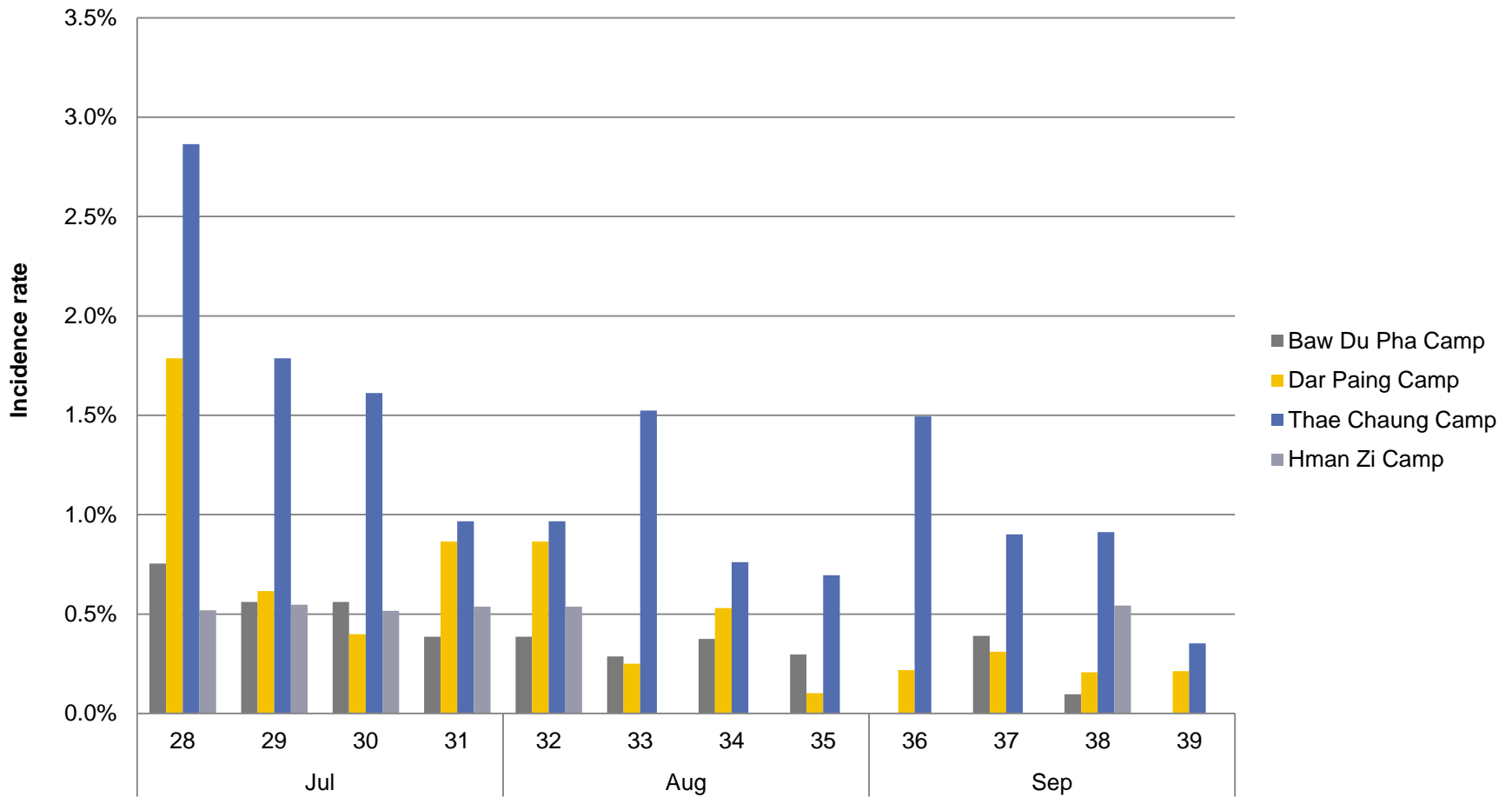
Results

average weekly incidence rate

June - September

Difference in male to female ratio is possibly related to <u>greater care seeking for boys</u> which is common in many cultures of South Asia

Correlates with findings from recent anthropological study regarding childcare practices

Over 5

	Male	Female
	0.8%	1.6%

Under 5

	Male	Female
	6.2%	7.8%

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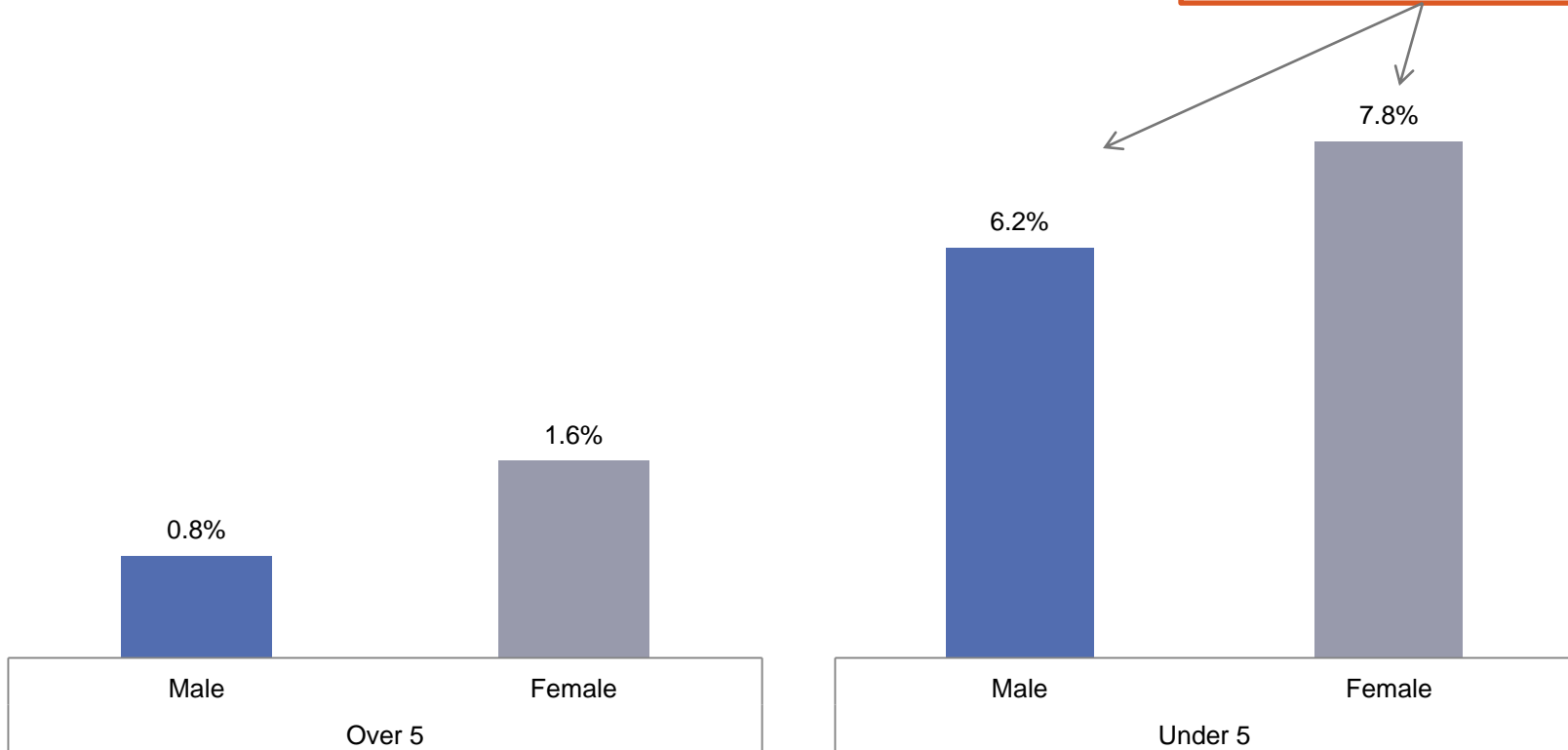
Water Quality Analysis

Overview

- A global water testing laboratory was set up at SCI for all the partners in the DFID Consortium

    - Lab is run by 4 technicians and supported by assistants and data entry persons

- Lab is equipped to process bacteriological, chemical, and physical tests for water quality

    - 4 membrane filtration incubator systems with large capacity for bacteriological testing (currently 66 test per day)

    - Colorimeter with ability to test wide range of chemical parameters

    - Arsenator for arsenic testing

- Larger focus on bacteriological since there chlorinated water is not used in most areas

    - Household (point-of-use) and raw water (point-of-source) regularly tested

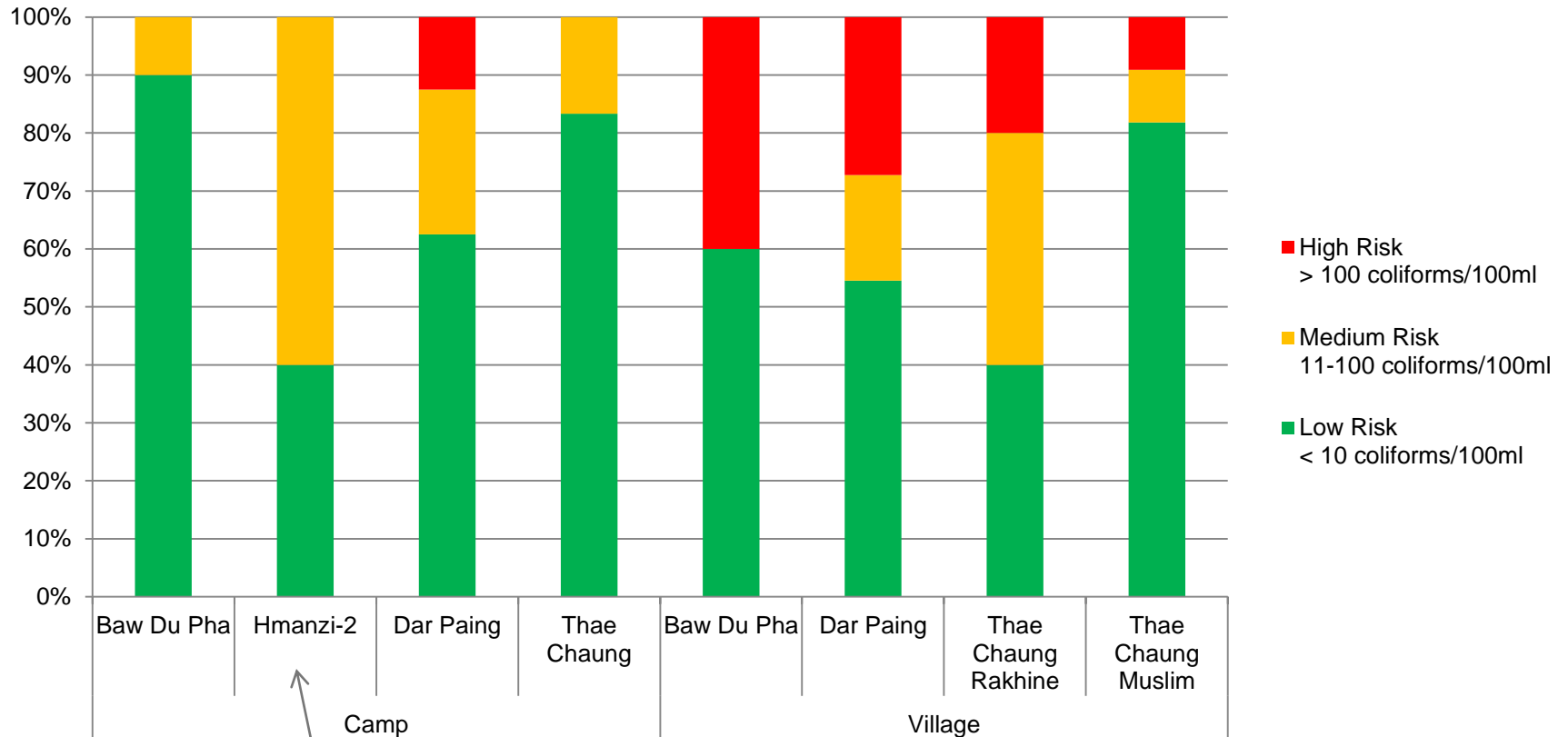- Bacteriological testing will provide critical feedback about effectiveness of ceramic water filter program

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Water Database

| Date (mm/dd/yy) | Automatic Calculations | | | Area Type | Area | Serial Number/ Location | Water Source Type | Test 1 - FC/100m | Test 2 - FC/100m | Test 3 - FC/100m | Average FC/100m | Automatic Calculation |
	Month	Week	Year									Water Quality Risk Level
20-Aug-14	Aug	34	2014	Camp	Dar Paing	4	Tubewell	1	3	0	1.3	Low Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	9	Tubewell	0	0	0	0.0	Low Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	the shelter (14),roo	Tubewell	0	0	0	0.0	Low Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	3	Tubewell	0	0	0	0.0	Low Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	1	Tubewell	>100	>100	>100	101.0	High Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	11	Tubewell	3	33	2	12.7	Medium Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	10	Tubewell	50	5	5	20.0	Medium Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	15	Tubewell	52	0	40	30.7	Medium Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	13	Tubewell	9	4	13	8.7	Low Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	south 02	Tubewell	13	0	7	6.7	Low Risk
20-Aug-14	Aug	34	2014	Camp	Dar Paing	8	Tubewell	1	1	3	1.7	Low Risk
27-Aug-14	Aug	35	2014	Camp	Baw Du Pha	Bh-46	Tubewell	0	0	0	0.0	Low Risk
27-Aug-14	Aug	35	2014	Camp	Baw Du Pha	Bh-42	Tubewell	25	8	3	12.0	Medium Risk
27-Aug-14	Aug	35	2014	Camp	Baw Du Pha	Bh-05	Tubewell	3	0	1	1.3	Low Risk
27-Aug-14	Aug	35	2014	Camp	Baw Du Pha	Bh-20	Tubewell	3	1	0	1.3	Low Risk
27-Aug-14	Aug	35	2014	Camp	Baw Du Pha	Bh-29	Tubewell	6	15	3	8.0	Low Risk
27-Aug-14	Aug	35	2014	Camp	Hmanzi-2	B-19	Tubewell	15	10	20	15.0	Medium Risk
27-Aug-14	Aug	35	2014	Camp	Hmanzi-2	B-15	Tubewell	15	12	25	17.3	Medium Risk
27-Aug-14	Aug	35	2014	Camp	Hmanzi-2	B-20	Tubewell	8	1	6	5.0	Low Risk
27-Aug-14	Aug	35	2014	Camp	Hmanzi-2	B-14	Tubewell	5	15	10	10.0	Low Risk
27-Aug-14	Aug	35	2014	Camp	Hmanzi-2	B-17	Tubewell	13	15	20	16.0	Medium Risk
3-Sep-14	Sep	36	2014	Village	Baw Du Pha	Chor Mulock -1	Well	TMC	TMC	TMC	TMC	High Risk
3-Sep-14	Sep	36	2014	Village	Baw Du Pha	Barlar Husum -2	Well	TMC	TMC	>100	TMC	High Risk
3-Sep-14	Sep	36	2014	Village	Baw Du Pha	Goni Amud Bh-1	Tubewell	0	14	8	7.3	Low Risk
3-Sep-14	Sep	36	2014	Village	Baw Du Pha	ArmeAmud Bh -2	Tubewell	16	0	10	8.7	Low Risk
3-Sep-14	Sep	36	2014	Village	Baw Du Pha	Noor Amud Bh -3	Tubewell	20	0	0	6.7	Low Risk
3-Sep-14	Sep	36	2014	Camp	Baw Du Pha	B-12	Tubewell	0	0	0	0.0	Low Risk

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Raw Water Quality Results

Villages clearly have poorer water quality and this can be directly attributed to the number of unprotected water sources
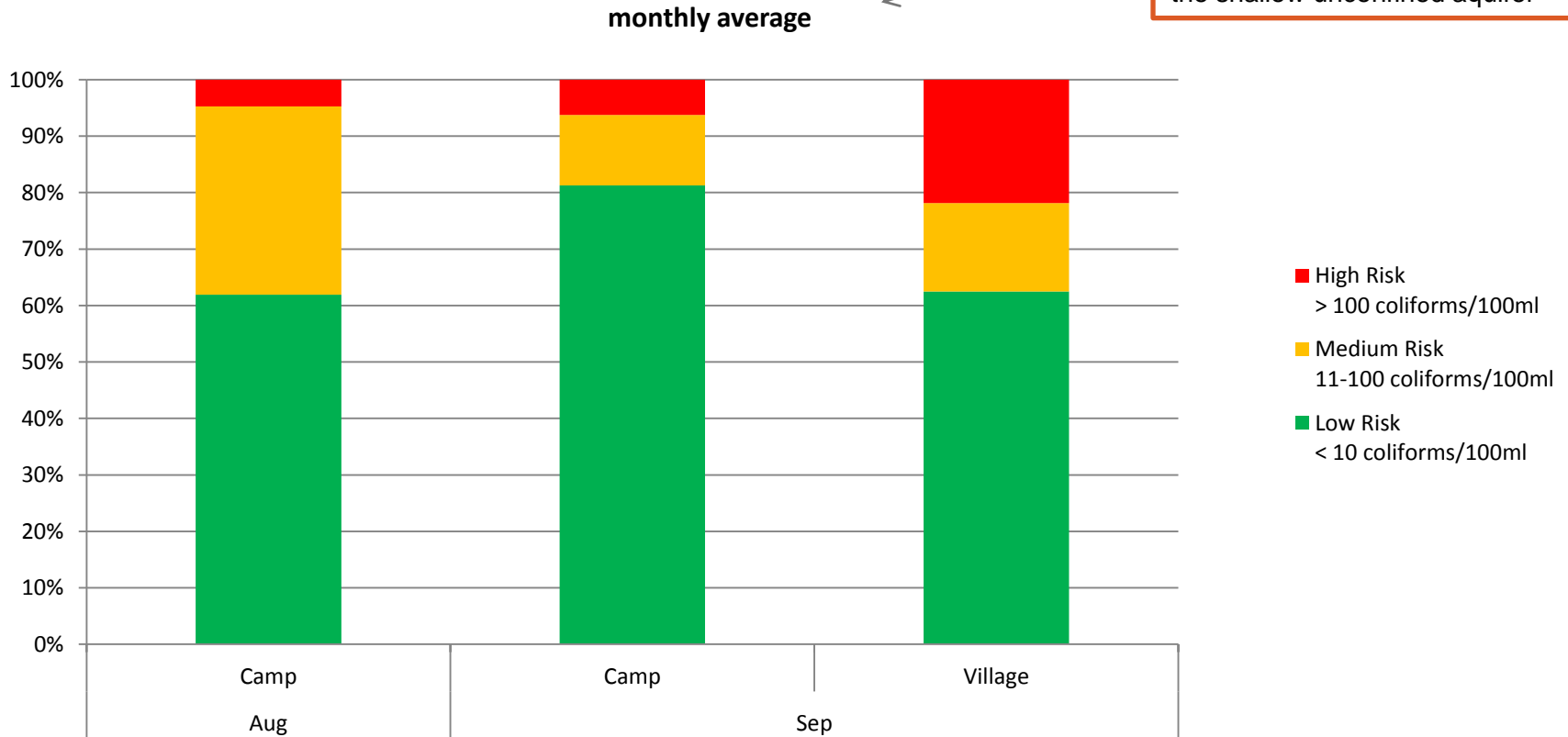
August - September

Legend:
- High Risk > 100 coliforms/100ml
- Medium Risk 11-100 coliforms/100ml
- Low Risk < 10 coliforms/100ml

Hmanzi Camp had the lowest diarrhea rates but here it shows that the water quality is quite poor
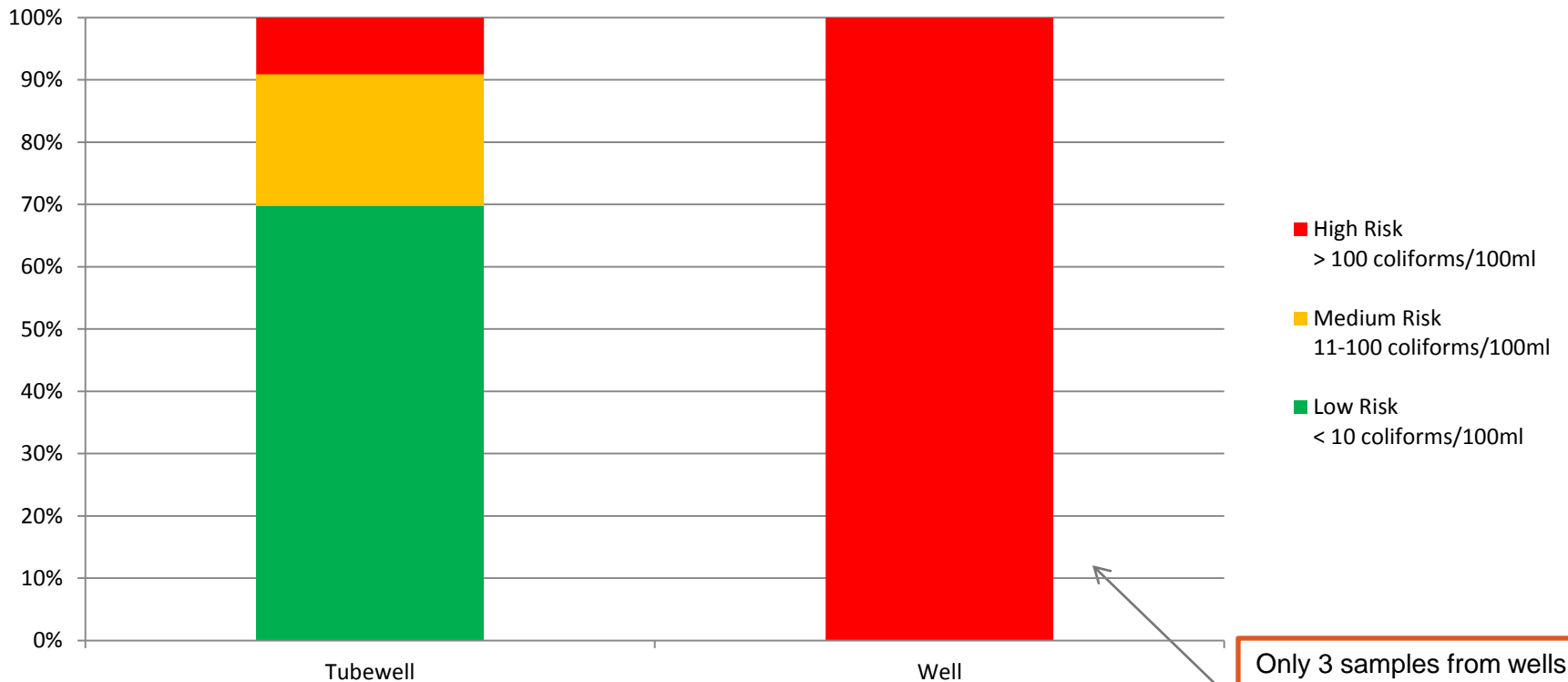
Raw Water Quality Results

We are largely interested in the season trends for water quality to better understand the monthly fluctuation in bacterial loading of the shallow unconfined aquifer
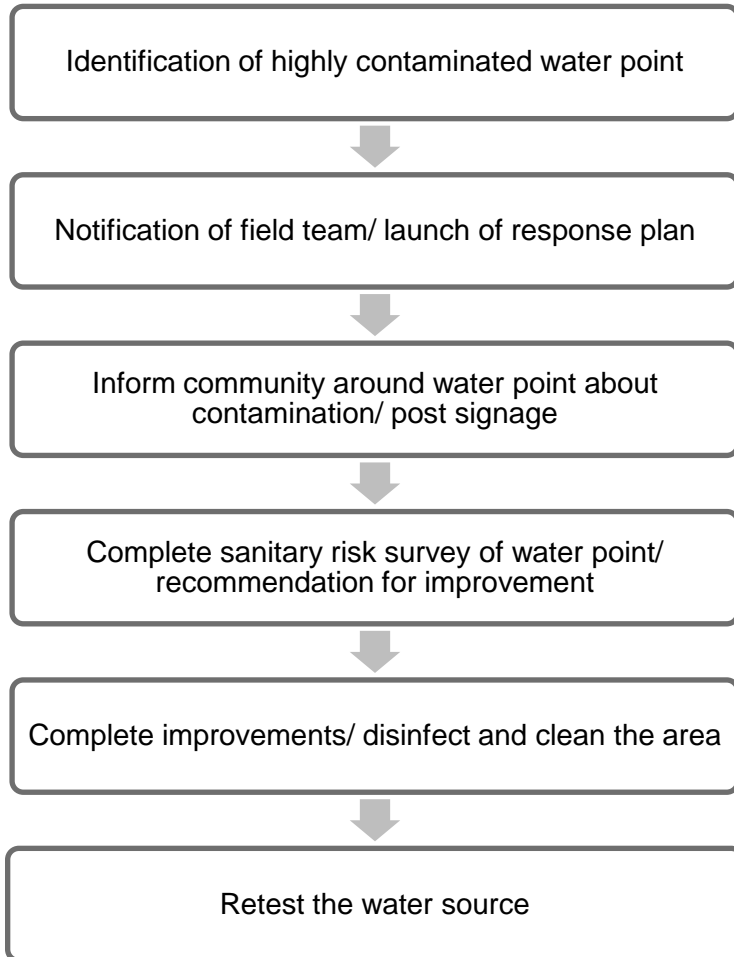
monthly average

Legend:
- **High Risk** > 100 coliforms/100ml
- **Medium Risk** 11-100 coliforms/100ml
- **Low Risk** < 10 coliforms/100ml

Raw Water Quality Results

Quality by source type - Villages

Legend:
- High Risk — > 100 coliforms/100ml (red)
- Medium Risk — 11-100 coliforms/100ml (yellow)
- Low Risk — < 10 coliforms/100ml (green)

Only 3 samples from wells, so more data is needed to confirm

Contaminated Source Response Plan

Identification of highly contaminated water point

Notification of field team/ launch of response plan

Inform community around water point about contamination/ post signage

Complete sanitary risk survey of water point/ recommendation for improvement

Complete improvements/ disinfect and clean the area

Retest the water source

Household Water Quality Results

Results show that the ceramic water filters are clearly effective in reducing bacteriological contamination

Legend:
- High Risk > 100 coliforms/100ml
- Medium Risk 11-100 coliforms/100ml
- Low Risk < 10 coliforms/100ml

CWF Not Present: Baw Du Pha, Hmansi-2, Dar Paing, Thae Chaung

CWF Present and in use: Baw Du Pha, Dar Paing, Thae Chaung
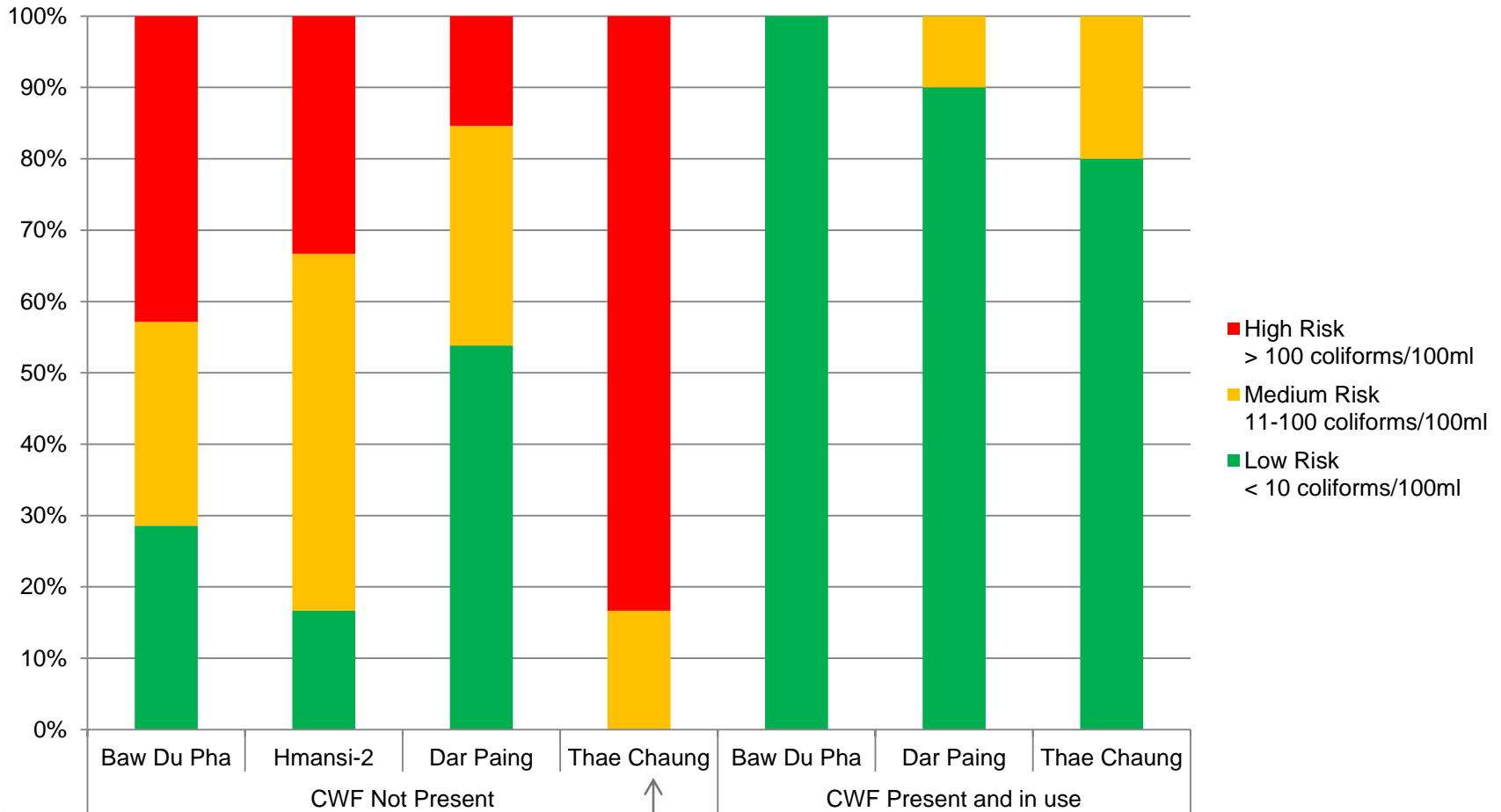
Why is Thae Chaung HH water quality so bad?