

Ensuring the accuracy of Myanmar census data step by step



1. Making sure all households were counted



2. Verifying the data collected



3. Securely delivering questionnaires to the Census Office



4. Safely storing and organising the questionnaires



5. Rigour in the receiving process



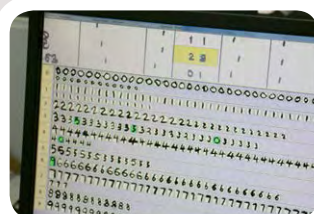
6. Preparing questionnaires for scanning



7. Registration before scanning



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9. Computerised character inspection



10. Key corrections



11. Checking the summary sheets



12. Monitoring and supervision



13. Addressing data inconsistencies



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Introduction



The Myanmar 2014 Population and Housing Census is a major national undertaking, collecting and analysing data from millions of households throughout the country. Managing the vast volume of data collected to ensure accurate results is complex and involves state-of-the-art technology and quality checks at each stage: collection, preparation, scanning, analysis and preparation of reports. While no census is perfect, these measures designed to uphold quality and minimise errors, will ensure that the Myanmar Census delivers results that are credible and reliable.

This booklet provides a step-by-step overview of the quality checks in place at each of the 14 different stages of the census process.

1. Making sure all households were counted:

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- **Local knowledge:** Enumerators worked in the localities they reside in and know.
- **High quality cartography:** Good maps and lists of structures were produced beforehand.
- **Supervision:** Enumerators submitted daily progress reports on households counted.



Prior to enumeration, census maps were drawn up for the whole country. 81,744 Enumeration Areas (EAs) were mapped, covering the entire country, with each containing as many as 100-120 households or as few as 30-50 in rural or mountainous areas. One enumerator was assigned to count the population in each EA.

EA maps and structure lists were produced for each ward and village tract in the country and distributed beforehand so that enumerators understood the boundaries of the areas allocated to them and the dwelling units they were to count. The structure lists were updated two days prior to the start of the data collection so that any new buildings and/or households could be added and those that no longer existed could be removed.



Local leaders at the village, village tract and ward levels supported the enumerators and helped distribute appointment cards to every household. The cards specified the date the enumerator would visit and whether it would be in the morning or afternoon. If an enumerator was not able to come at the specified time, the leader would reschedule the visit.

Most enumerators were primary school teachers based in the areas where they were assigned to collect data, and familiar with the terrain, local language and people living in the area.

After a household was enumerated, it was marked with a census sticker (or sometimes chalk) to show the unique structure number on the corresponding questionnaire. This enabled supervisors to revisit any household as needed. Publicity materials advised residents to report to the village leader or the Township Officer if an enumerator did not visit their household by the eighth day of the census.

Enumerators submitted daily progress reports, indicating the number of households counted that day and since the beginning of the enumeration. This allowed supervisors to monitor progress and provide necessary support so that enumerators covered their assigned areas within the allocated time.

Supervisors reported to a Ward or Village Tract officer, who compiled a daily report for the Township Officer. These reports assisted officials at all levels to monitor progress and where necessary to take remedial action in a timely fashion.

2. Verifying the data collected:



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- **Questionnaire check:** Before leaving each household, enumerators made sure all questions were answered and recorded.
- **Random re-Interviews** were conducted for at least three households in every EA.
- **EA Summary sheets** completed by enumerators listed all the households where they conducted interviews.
- **Township Committee supervision** ensured that all EAs were accounted for.



Enumerators were trained to check the census questionnaires thoroughly after completing the interview and before leaving the household. They ensured all questions were asked, and responses correctly recorded. If any response was not clear, the enumerator sought clarification from the household head. Enumerator training flagged possible contradictory responses that they should watch out for and taught them how to gently probe to get accurate information.

Every evening, field supervisors checked each completed questionnaire, making sure the writing was legible, questionnaires were handled with care, the enumerator had worked within his/her assigned EA, and the counts of males and females in each household were correct. If an inconsistency was identified, the enumerator returned to the household to record the correct response. The supervisor and the enumerator signed each reviewed questionnaire, indicating both were satisfied with the information collected.

3. Securely delivering questionnaires to the Census Office:



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- **Transportation** of all census materials was done by professional transport companies.
- **Security officers** accompanied each shipment.



Professional transport companies, accompanied by Township Census Officers and security officers, delivered all the questionnaires and related documents in sealed boxes to the Census Office at the Department of Population in Nay Pyi Taw by 6 May 2014.



4. Safely storing and organising the questionnaires:



- **Storage area** holds an estimated 11 million completed questionnaires.
- **Cataloguing of** questionnaires by location allows for ease of retrieval.



At the Census Office, boxes containing the questionnaires were arranged by state/region, district, township, ward or village tract, and EA, using labelled shelves and a detailed map of the storage facility. This catalogue system allows authorised personnel to retrieve questionnaires for the data capturing process. The questionnaires in the storage room are always guarded, and must be signed for when removed for analysis.

Maps, summary sheets, structure lists and progress reports are also catalogued and safely stored for easy retrieval, but only by persons authorised by law to access the information.

Coloured stickers on boxes indicate whether the questionnaires have been prepared for scanning (blue), registered in the scanning system (green), or already scanned (orange).





5. Rigour in the receiving process:



- **Count** of questionnaires received and completed was verified by Township Census Officers.
- **Completeness** was confirmed and explanations provided for any missing EAs or households.



All Township Census Officers visited the Census Office to account for any difference between the number of questionnaires received and returned for their EAs. This could occur, for example, if EA maps were out of date or EAs had been split or merged. They had to account for any discrepancy when comparing households enumerated with the EA summary sheet or structure list.

Township Census Officers also confirmed that maps, summary sheets and progress reports had been returned, and that none were missing.

The officials counting the questionnaires and the Township Census Officers signed forms verifying that the information was correct. This process was completed by 3 July 2014.

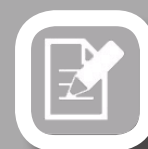


6. Preparing questionnaires for scanning:



6

- **EA codes** were checked.
- **Questionnaires were checked for damage**, staples and clips were removed, and the forms were then split in two along a perforated line.
- **Registration forms** detailed the number of questionnaires to be scanned for each EA.



The number of questionnaires reported as received from each EA was registered in the scanning system.

Actual questionnaires from each EA were counted. If the number differed from the scanning system count, supervisors investigated. Questionnaires were checked to ensure they were stored in the right box, in sequential order, and had the correct state code to ensure the information would be attributed correctly to the EA.

Specially trained staff visually inspected each questionnaire. If markings or numbers were not filled in properly, the forms were corrected so the scanner could read the data. All corrections can be traced back to the checking office. No data were changed at this stage, even where incorrect responses were evident.

Any questionnaire that was damaged or filled in with ink was transcribed to a new questionnaire, after approval by a supervisor. The preparation clerk filled out a form detailing why the transcription was necessary, and the supervisor signed it after verifying that the information had been transferred correctly. Damaged originals were filed for later retrieval if necessary.



7. Registration before scanning:



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Information from the pre-scanning process was further checked for discrepancies and then entered into a database containing all the EA codes for Myanmar. This information is linked to the scanning system, so the scanner can tell if there is a difference between the number of questionnaires received and scanned.



8. High-tech scanning process:



8

- **Eight state-of-the-art scanners** working simultaneously can read around 150,000 questionnaires a day, reject any damaged forms and identify character anomalies.



A local information technology company has technicians on site at all times to provide support in the rare case of a scanner system breakdown. Engineers from the international company that supplied the scanners and software trained these technicians. If any problem occurs, the international engineers can also access the scanners online and work with the national technicians to fix it.

If the number of scanned questionnaires does not match the number registered, the scanning machine rejects the questionnaires, and the supervisor goes back to the registration team to address the discrepancy.

As the forms are scanned, the information and images are automatically captured in a database. If errors are found on over 10 questionnaires, the Preparation Team is consulted.



9. Computerised character inspection:

Missed Seeds / Total Seeds : 32 / 1171
Inspected : 99446

0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

- **Scanners detect unreadable or possibly erroneous characters** on the forms and automatically send them to the Key Corrections team for further processing.



If the scanner cannot recognise numbers, perhaps due to poor handwriting, the system will display the illegible material and suggest a likely correct figure, based on the information in the database. This can occur, e.g., if a 3 looks like an 8.

The database also deliberately plants errors to ensure that staff are alert and continuously scrutinising the forms for character anomalies.



10. Key corrections:



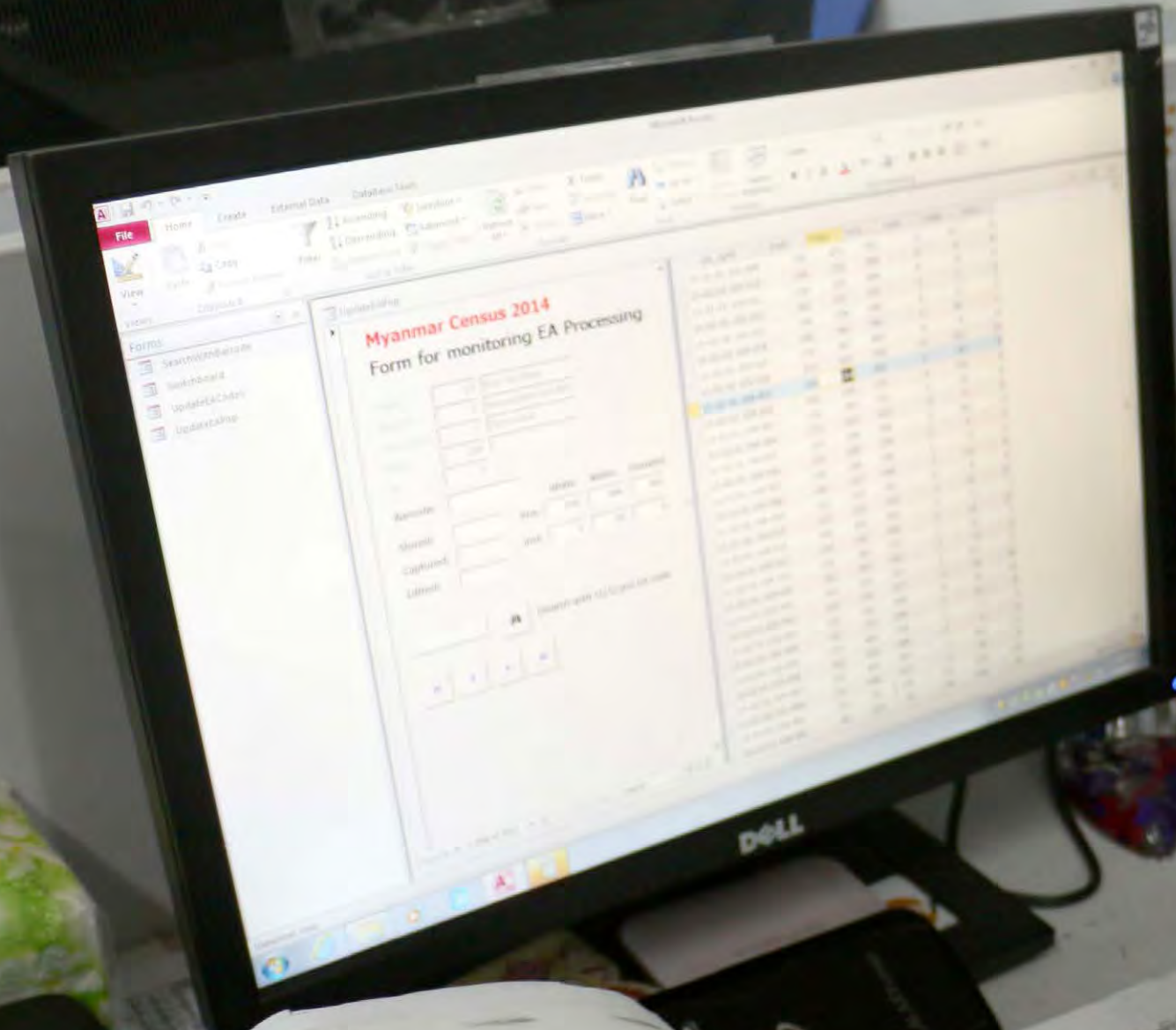
- **Operators check the highlighted numbers** on each questionnaire and make necessary corrections.



An operator clicks on the unrecognised number to enlarge it and see what it should be. If unsure about the correction, the operator sends the case to the supervisor.

The scanning software captures the number of cases corrected as well as who made the correction.

Corrections can only be made on numbers highlighted by the system and not on any other data.



Area	Village	Household	Person	Sex	Age	Marital Status	Education	Religion	Occupation	Income
151	152	153	154	155	156	157	158	159	160	161
162	163	164	165	166	167	168	169	170	171	172
173	174	175	176	177	178	179	180	181	182	183
184	185	186	187	188	189	190	191	192	193	194
195	196	197	198	199	200	201	202	203	204	205
206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227
228	229	230	231	232	233	234	235	236	237	238
239	240	241	242	243	244	245	246	247	248	249
250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271
272	273	274	275	276	277	278	279	280	281	282
283	284	285	286	287	288	289	290	291	292	293
294	295	296	297	298	299	300	301	302	303	304
305	306	307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324	325	326
327	328	329	330	331	332	333	334	335	336	337
338	339	340	341	342	343	344	345	346	347	348
349	350	351	352	353	354	355	356	357	358	359
360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381
382	383	384	385	386	387	388	389	390	391	392
393	394	395	396	397	398	399	400	401	402	403
404	405	406	407	408	409	410	411	412	413	414
415	416	417	418	419	420	421	422	423	424	425
426	427	428	429	430	431	432	433	434	435	436
437	438	439	440	441	442	443	444	445	446	447
448	449	450	451	452	453	454	455	456	457	458
459	460	461	462	463	464	465	466	467	468	469
470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491
492	493	494	495	496	497	498	499	500	501	502
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514	515	516	517	518	519	520	521	522	523	524
525	526	527	528	529	530	531	532	533	534	535
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569	570	571	572	573	574	575	576	577	578	579
580	581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600	601
602	603	604	605	606	607	608	609	610	611	612
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624	625	626	627	628	629	630	631	632	633	634
635	636	637	638	639	640	641	642	643	644	645
646	647	648	649	650	651	652	653	654	655	656
657	658	659	660	661	662	663	664	665	666	667
668	669	670	671	672	673	674	675	676	677	678
679	680	681	682	683	684	685	686	687	688	689
690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711
712	713	714	715	716	717	718	719	720	721	722
723	724	725	726	727	728	729	730	731	732	733
734	735	736	737	738	739	740	741	742	743	744
745	746	747	748	749	750	751	752	753	754	755
756	757	758	759	760	761	762	763	764	765	766
767	768	769	770	771	772	773	774	775	776	777
778	779	780	781	782	783	784	785	786	787	788
789	790	791	792	793	794	795	796	797	798	799
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811	812	813	814	815	816	817	818	819	820	821
822	823	824	825	826	827	828	829	830	831	832
833	834	835	836	837	838	839	840	841	842	843
844	845	846	847	848	849	850	851	852	853	854
855	856	857	858	859	860	861	862	863	864	865
866	867	868	869	870	871	872	873	874	875	876
877	878	879	880	881	882	883	884	885	886	887
888	889	890	891	892	893	894	895	896	897	898
899	900	901	902	903	904	905	906	907	908	909
910	911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930	931
932	933	934	935	936	937	938	939	940	941	942
943	944	945	946	947	948	949	950	951	952	953
954	955	956	957	958	959	960	961	962	963	964
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976	977	978	979	980	981	982	983	984	985	986
987	988	989	990	991	992	993	994	995	996	997
998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008
1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019
1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041
1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052
1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063
1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074
1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085
1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096
1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107
1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118
1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129
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1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283
1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294
1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305
1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316
1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327
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1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360
1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371
1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382
1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393
1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404
1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415
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1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470
1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481
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1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514
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1526										

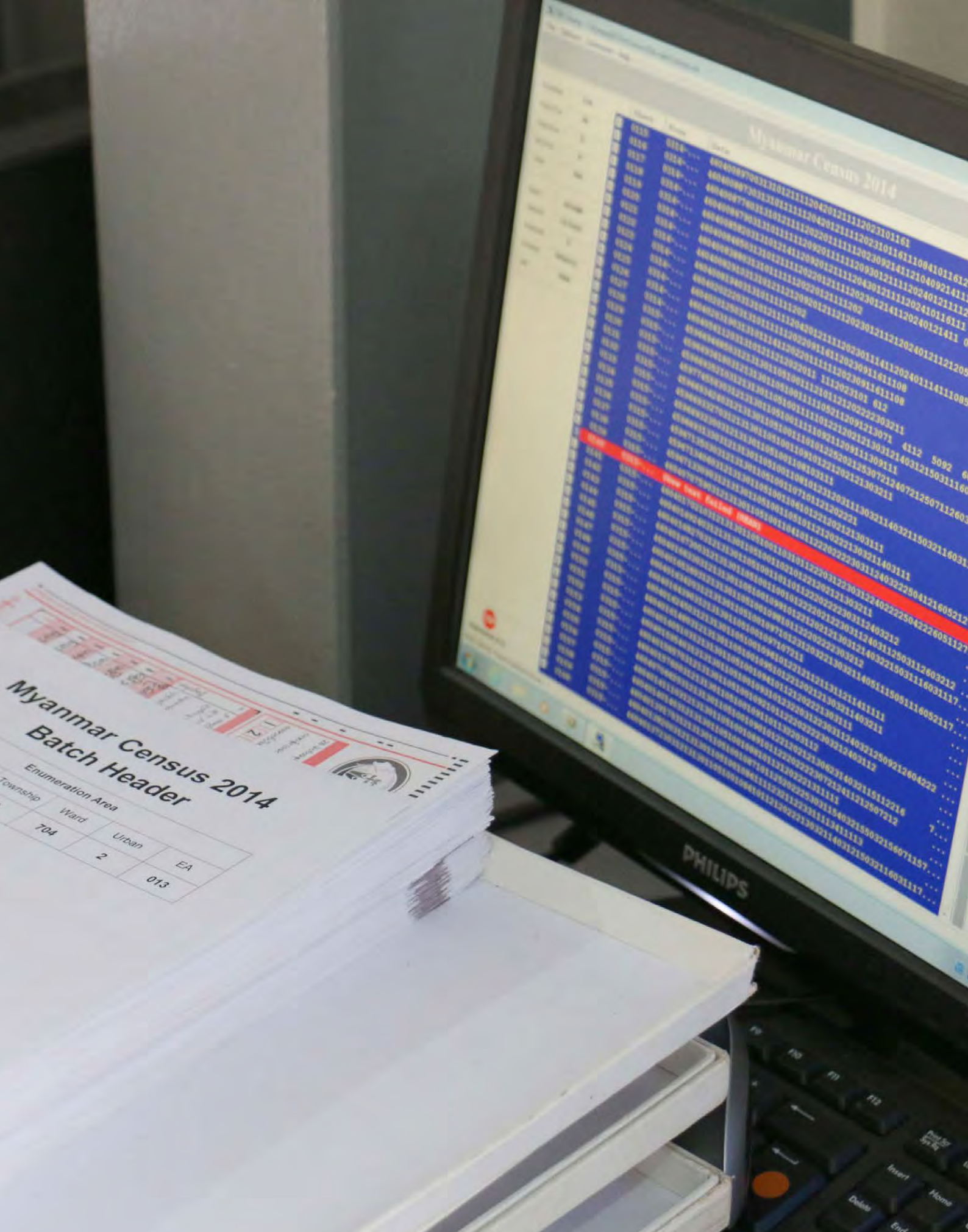
11. Checking the summary sheets:



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The total number of males and females enumerated in each household are recorded on the EA Summary Sheets, along with the number of private and institutional households and the total EA population. Staff checked that the population totals for every household added up correctly on the Summary Sheet and made necessary corrections.

The information from all these forms was manually entered into a computer database by 8 July 2014, and will be used to prepare the provisional census results due to be released in August 2014.



12. Monitoring and supervision:



The scanning system enables managers to track progress, for example, by showing how many forms have been scanned or how many characters have been inspected at any given time.

This allows them to verify that staff are performing their jobs skilfully, as well as to reallocate staff as needed, for instance to address a backlog that is slowing the data capture process.

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13. Addressing data inconsistencies:



In some instances, information collected in the field may seem illogical or not be consistent with common sense. This happens in all censuses, both in developed and developing countries. For example, a 5-year-old child may be recorded as having completed secondary education, or a 6-year-old as having given birth to two children.

Computer programmes using demographic methodology can identify and correct such inconsistencies by looking at the whole profile of the respondent. The United Nations has produced guidelines and procedures to facilitate this, once all data have been scanned and exported to analysis software. This process is done carefully to ensure consistency and improve the quality of information generated from the census.



14. Protecting the data:



The Census Office is using state-of-the-art computer technology to make certain that all census data is stored safely and efficiently. All census data is backed up locally and remotely every day.



15. Conclusion:



Collecting, verifying and analysing data through Myanmar's population census is an enormous and time consuming undertaking involving numerous distinct steps. Quality assurance at each stage is a key component of the process, and essential to ensuring the data's overall reliability. Access to accurate and reliable population data is essential as the country formulates its development policies and projects to improve the lives of all its people.

For additional information, please contact the Department of Population at the Ministry of Immigration and Population at:

www.dop.gov.mm or <http://myanmar.unfpa.org/census>

Group visits to the Census Data Processing Centre can be arranged by prior appointment with the Department of Population.

To find out more information visit:

www.dop.gov.mm

<http://myanmar.unfpa.org/census>

