Ministry of Health

Ethiopia

Health Data Quality Review: System Assessment and Data Verification for Selected Indicators

2018

DQR

Ethiopia
Health Data Quality Review: System Assessment and Data Verification 2018

Ethiopian Public Health Institute

Addis Ababa, Ethiopia

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Addis Ababa, Ethiopia

This report presents findings of the 2018 Ethiopia Data Quality Review (DQR), which was implemented by the Ethiopian Public Health Institute.

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Preface

Measurable reports in line with sector information must be precise and appropriate to be viably and soundly used by policy makers and partners for decision making, resource mobilization, and managing national programs/projects. Due to the significant adverse effect of poor quality data which is caused by weak Monitoring and Evaluation (M & E) systems on decision-making, data quality and M & E systems assessments have become critical focus areas to authorities across all levels and to the wider stakeholders.

To this impact, the Growth and Transportation Plan (GTP) has placed need in enhancing sectoral information administration frameworks through M & E frameworks appraisals and check of information gathered through set up frameworks at national, intermediate and site levels.

The 2018 national Health Data Quality Review (DQR) was the second of its type, the first was done on 2016. Accessibility of basic information is at the core of evidence based basic leadership in the wellbeing area. It was generally perceived that quality information prompts better clinical and wellbeing executive choices that results in better wellbeing conditions. The Federal Ministry of Health (FMOH) has been working towards consistently enhancing information and data quality inside the wellbeing part.

Along with this direction, the Ethiopian Public Health Institute (EPHI) has conducted the present Ethiopian Data Quality Review (DQR) survey to determine the quality of Health Management Information System (HMIS) data, data management system and provide information for health sector managers and other stakeholders for possible action that will help to improve Health Management Information System (HMIS) quality across the country.

Finally, on behalf of the Ethiopian Public Health Institute (EPHI), I express our appreciation to the Health System and reproductive health research directorate of EPHI for providing guidance in the process of design, execution and analysis of the survey. I would like to pass our gratitude to all stakeholders specifically the World Bank for the financial support and individuals who have contributed to the success of the survey including data collectors, regional coordinators, data managers, IT unit, procurement and store staff, and EPHI drivers for their dedicated and tireless effort for the accomplishment of the survey.

Dr. Ebba Abate

Director General

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Abbreviations/Acronyms

ANC	Antenatal care
ANC1	First antenatal care visit
CAPI	Computer assisted personal interviewing
CSPro	Census and survey processing system
DPT	Diphtheria Pertussis Tetanus
DQR	Data quality review
DV	Data verification
EHHMIS	Electronic health management information system
EPHI	Ethiopian public health institute
FMOH	Federal ministry of health
FP	Family planning
HIS	Health information system
HMIS	Health management information system
IFSS	internet file streaming system
NGO	non-governmental organizations
Penta	Pentavalent vaccine
PMTCT	prevention of mother-to-child transmission
RHBs	regional health bureau
SA	system assessment
SARA	service availability and readiness assessment
SNNP	South nations nationalities and peoples
TB	Tuberculosis
UNICEF	united nations children fund
VF	verification factor
WHO	World health organization.
WoHOs	Woreda health office
ZHDs	zonal health departments

Executive summary

Introduction: The 2018 national Health Data Quality Review (DQR) was the second of its type, the first was done on 2016. Availability of quality data was at the heart of a functioning evidence-based decision making in the health sector. It was widely recognized that quality data leads to better clinical and health administrator decisions that results in better health outcomes. The Federal Ministry of Health (FMOH) has been working towards continuously improving data and information quality within the health sector. However, data quality was not at the required level to inform decisions on health policy, health programs, and allocation of resources. The objective of this assessment was to determine the quality of HMIS data and data management system and provide information for health sector mangers and other stakeholders for possible action.

Method: The 2018 Ethiopia data quality review assessment was across-sectional study which uses the World Health Organization's Data Quality Review tool after customization to the local context. The sample size for the DQR was determined by a combination of census of hospitals and random samples of health centres and private clinics. A total of 629 health facilities, 365 Woreda/districts, 63 zones, nine regions and two city administrative council health bureaus were included in the survey.

DQR has two components namely system assessment and data verification. Data verification was done for the selected seven indicators (Antenatal Care first visit, Institutional deliveries, Pentavalent/DTP third dose in children under one year, PMTCT coverage, TB cases, Confirmed malaria cases, and Family planning). Data of these indicators reported during first quarter of 2010 Ethiopian Fiscal year (July 1/2017 to September 30/2017 G.C.) were used for the review.

Result: In the system assessment component, the proportion of facilities that had appropriately trained staff responsible for data collection and compilation, written guidelines on reporting, and routine process for checking quality of reports was(17, 37 and 39 percent respectively).Proportion of all service assessment indicators increased as the health unit level increases.

The data verification also showed that health facilities had discrepancies in their reported and source document. The verification factor for most of the indicators at health facility level show that the figures in the source documents were lower than the figures reported to the next administrative level. The higher the administrative level the better the Data verification factor.

Data showed that at facility and Woreda level there was no marked difference in the actual percentage of system assessment indicators from 2016. At Zonal level Data management and reporting and supportive supervision and information use indicator components of system assessment had shown an improvement in the actual percentage of findings. Regional system assessment findings had also shown an increased actual percentage for all indicators since 2016.

The result of the current survey and the comparison with the previous shows that there was still low data quality at health facility level , emphasizing the need to work hard on lower level of the health system/health facilities to improve the quality of health related data in the country.

1. Introduction

1.1. Background information

No health data from any source can be considered perfect. All data are subjected to a number of limitations related to quality, such as missing values, bias, measurement error, and human errors in data entry and computation.

Health facility data are a critical input for assessing national progress and performance on an annual basis and they provide the basis for subnational/district performance assessment (WHO[1]). Accurate and reliable (Quality) health care data are needed for:

- determining the continuing and future care of a patient at all levels of health care;
- medico-legal purposes for the patient, the doctor and the health care service;
- maintaining accurate and reliable information about diseases treated and surgical procedures performed in a hospital and within a community, as well as immunization and screening programmes, including the number and type of participants;
- clinical and health service research and outcomes of health care intervention, if required;
- accurate, reliable and complete statistical information about the uses of health care services within a community;
- teaching health care professionals; and
- Working out staffing requirements and planning health care services.

Quality of data was a key factor in generating reliable health information that enables monitoring progress and making decisions for continuous improvement. Data quality assessment was needed to understand how much confidence can be put in the health data presented. In particular, it was important to know the reliability of national coverage estimates and other estimates derived from HMIS data that are generated for health sector reviews, as these often form the basis for annual monitoring.

World Health Organization (WHO) proposed the Health Facility Data Quality Report Card (DQRC), which was a methodology that examines certain dimensions of data quality through a desk review of available data and a data verification[1]Several studies in Africa on health data information have shown that poor data quality as their main finding (Yolaine, 2014; and Sarah, 2011).It was hypothesized that Health facility data are a critical input into assessing national progress and performance on an annual basis and they provide the basis for sub national / district performance assessment. It was recommended to implement data verification with the annual health facility survey (Service Availability Readiness Assessment (SARA)) on a representative sample of health facilities to obtain a national level estimate of the verification factor for the health information system[1].

The Federal Ministry of Health (FMOH) has been working towards continuously improving data and information quality within the health sector. However, data quality was not at the required level to inform decisions makers on health policy, health programs, and allocation of resources[2].In addition, it was evident that conducting Data Quality Review (DQR) survey and utilizing it for system improvement plays vital role in strengthening evidence based Health service.

The purpose of the survey was to assess the quality of health related data on selected seven indicators (antenatal care first visit, institutional deliveries, pentavalent/DTP third dose in children under

[1] Guide to the health facility quality report card, WHO
[2]Health data Quality training module, MOH, 2018

one year, PMTCT coverage, TB cases, confirmed malaria cases, and family planning). It evaluates data on the seven indicators at the different levels of the health system (Health facility, Woreda, Zone and Region).

1.2. Objectives

The objectives of DQR survey were to:

- Assess the existence of health information systems inputs e.g. human resources using the seven selected indicators.
- Identify the status of data management system in all levels of the health system.
- Determine the discrepancy between the source document and the next reporting level for selected indicators.
- Monitor the performance and the capacity to produce good quality data over time.

1.3. Definition of key terms

Indicator: was a variable that measures one aspect of a program or project that was directly related to the program's objectives.

Data verifications: was a quantitative comparison of, recounted to reported data and a review of the timeliness, completeness and availability of reports.

Verification factor (VF): Number of recounted events from source document / number of reported events from HMIS report.

A verification factor (VF) of < 1: indicates a lower number were recorded as being provided at the source levels than are reflected in the number sent to next levels (over reporting). Conversely, a VF > 1: indicates that a higher number were recorded as being provided at source levels than are reflected in the number sent to next levels (underreporting). Completeness of facility reporting Percentage of expected monthly facility reports received for a specified period time (the three months, July – September 2017).

Completeness of facility reporting (%):was defined as the number of reports received, according to schedule, from all health facilities , divided by the total expected reports from all facilities that are supposed to report to the HMIS for a specified time period (the three months, July – September 2017). The numerator was the actual number of facilities that submit a report and the denominator was the total number of health facilities that are expected to submit a report. Total number of facility reports received at the unit/Total number of expected facility reports at that unit = completeness of reporting.

- At service delivery point, it refers to all the relevant data elements in a patient/client register are filled.
- At Health Administrative unit – data completeness has two meanings:
  - ✓ All the data elements in a database or report are filled: "Content" completeness
  - ✓ The health administrative unit has reports from all the health facilities and/ or lower level health administrative units within its administrative boundary : "Representative" completeness

Timeliness: data was collected, transmitted and processed according to the prescribed time and available for making timely decisions.

Reliability/Consistency: The data generated by a program's information system are based on protocols and procedures that do not change according to who was using them and when or how often they are used. The data are reliable because they are measured and collected consistently.

Integrity: Data have integrity when the system used to generate them was protected from deliberate bias or manipulation for political or personal reason.

Confidentiality: Confidentiality means that clients are assured that their data will be maintained according to national and/or international standards for data. This means that personal data are not disclosed inappropriately.

1.4. Methodology

1.4.1. Study design and sampling

The 2018 Ethiopia data verification and system assessment was a cross-sectional study which uses the World Health Organization's Data Quality Review tool after customization to local context. All hospitals, sampled health centres, private clinics that were in the 2018 SARA survey were included in the survey. In addition Woreda health offices, Zonal health department and regional health bureau's where the sampled facilities located were included. The survey was conducted in 629 health facilities, 365 Woreda/districts, 63 zones and nine regional and two city administrative council health bureaus (Table 1.4).

The sample size for the DQR was determined by a combination of census of hospitals and random samples of health centres and private clinics, which was already done for the broader Service Availability and Readiness Assessment (SARA) survey. Because of their importance and limited in number all hospitals were included in the survey and allowing for inclusion of newly identified hospital in the survey. A representative sample of health centre and private clinics were selected.

Table1.4. Percent distribution and number of surveyed facilities, by background characteristics, DQR Ethiopia 2018

Background characteristics		Percent distribution	Facilities surveyed	
			Un- weighted	**Weighted**
Facility type	Referral hospital	0.4	30	3
	General hospital	2	116	9
	Primary hospital	2	159	13
	Health centre	45	164	281
	Higher clinic	2	13	12
	Medium clinic	17	76	107
	Lower clinic	32	71	204
Managing authority	Government/Public	48	409	301
	NGO/not-for profit	1	11	3
	Private-for profit	51	195	319
	Mission/Faith based	1	13	3
	Other	0.3	1	2
Region	Tigray	5	65	34
	Afar	2	38	10
	Amhara	25	96	154
	Oromia	31	109	196
	Somali	2	41	15
	Benishangul Gumuz	1	31	8
	S.N.N.P	22	89	136
	Gambella	2	30	11
	Harari	1	25	3
	Addis Ababa	9	76	57
	Dire Dawa	1	29	4
Total		100	629	629

1.4.2. Data collection methods

The WHO Data Quality Assessment (DQA) tool was used for the survey. The original tool was customized to include additional three indicators (Institutional deliveries, PMTCT, and Contraceptive acceptors). The final customized tool addresses seven indicators. i.e. Antenatal Care first visit, Institutional

deliveries, Pentavalent/DTP third dose in children under one year, PMTCT coverage, TB cases, Confirmed malaria cases, and Contraceptive accepters.

Through analysis of these seven indicators, the tool quantifies problems of data completeness, accuracy and external consistency and thus provides valuable information on "fit-for-purpose" of health facility data to support planning and annual monitoring. Data verification refers to the assessment of reporting 'correctness', that was, comparing health facility source documents to Health Information System (HIS) reported data to determine the proportion of the reported numbers that can be verified from the source documents. It checks whether the information contained in the source documents has been transmitted correctly to the next higher level of reporting, for each level of reporting, from the health facility level to the national level[3].

All data entry and editing programs were written using CSPro software application. Computer assisted personal interviewing–CAPI was used for data collection. The questionnaire, which was prepared in English, was loaded on tablet computers. Eighty-nine, mostly health providers (nurses, midwives, and health officers) were trained in the application of survey instruments and computer programmes. The training included classroom lectures and discussion, practical demonstrations, mock interviews, role-plays, and field practices. The participants were also given daily homework (to conduct mock interviews among themselves using the survey tools).

The questionnaires were pretested to detect any possible problems in the flow of the questionnaires, gauge the length of time required for interviews, as well as any problems in the translations. The pre-test also helped to detect any problems with the data entry programs. After the pre-test, the questionnaires and computer programmes were updated and made ready for the survey.

All data collected in the field was sent to EPHI central server using Internet File Streaming System (IFSS) by the team supervisors. Then, the data analysis was done using STATA and with frequency distribution tables, percentages and graphs of different indicators. In addition to national average, the verification factor was produced for different levels of health system administration such as regions, zones, Woreda and facilities. Verification factor (VF) was calculated for the months of July, August and September, 2017.

2. Results

2.1. System assessment (SA) findings

Facility level system assessment component looks in to data related structure and function, Indicator definitions and reporting guidelines, data collection tools and reporting forms, data quality and supervision and data maintenance and confidentiality. At Woreda, Zone and regional level it assesses all the above components plus demographic information and data use.

2.1.1. Facility SA

Figure 2.1.1.1 shows facility level System Assessment (SA) findings.

- Thirty eight, 34, and 41 percent of facilities had trained staff on data collection and compilation, written guideline on reporting, and routine process for checking quality of reports, respectively.
- Ninety one percent of facilities report to government system and 65 percent documented supervisory visit in the last six months.
- Fifty percent of facilities had clear instructions on how to complete reporting forms.

[3] Guide to the health facility data quality report card, WHO

Figure 2.1.1.1. Summary of proportion of facility level service assessment indicators national, DQR, Ethiopia, 2018

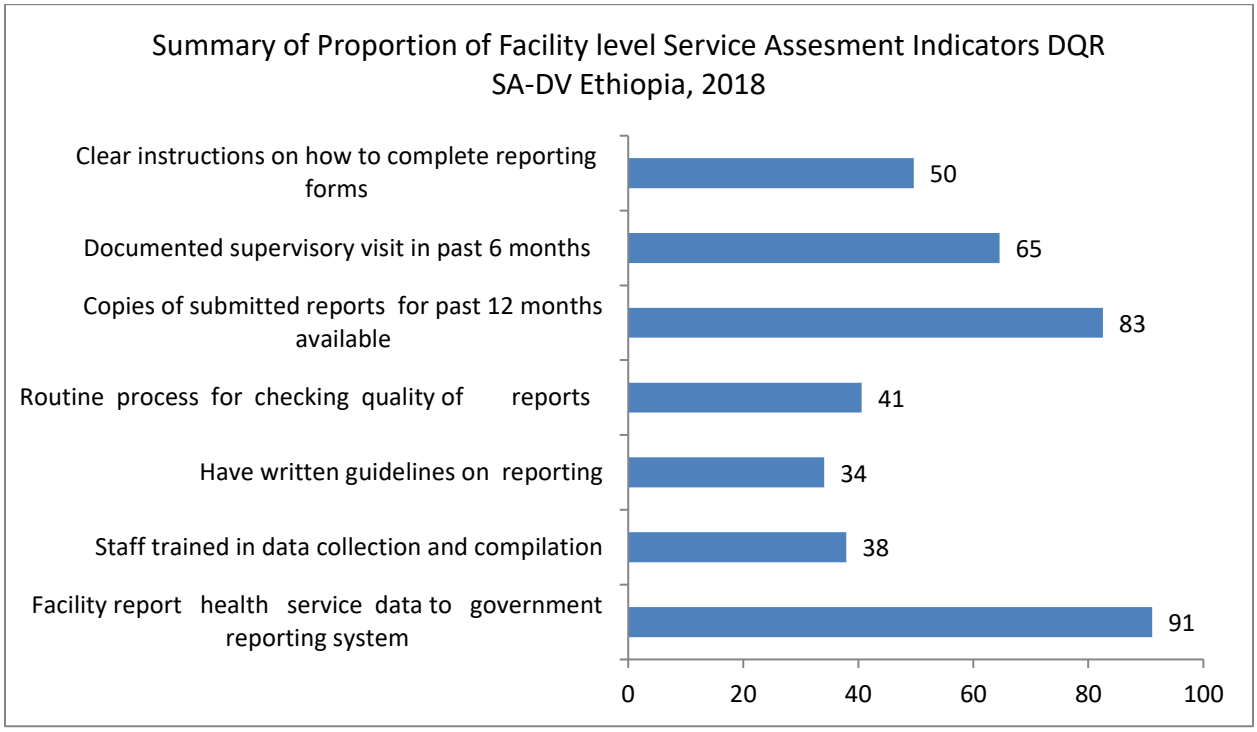


Table 2.1.1.1 shows facility level SA findings by background characteristics

- All faith based and government facilities, and 83 percent of private for profit facilities report health service data to government reporting system.
- All health centres, primary and general hospitals, 97 percent of referral hospitals, and 83 percent of private clinics report health service data to government reporting system.
- Private clinics were less likely to have SA indicators compared with the other managing authority.
- Facilities in Benishangul Gumuz (75 percent) were less likely to report health service data to government reporting system.
- All regions except Harari, Tigray, SNNP, Addis Ababa and Dire Dawa had less than four in ten of their facilities with trained staff on data collection and compilation.
- Facilities in Harari, and Tigray regions are more likely to have routine process for checking quality of reports (89, and 84 percent respectively).
- Facilities in Somali region are less likely to have copies of submitted reports for past twelve months available (19 percent).

Table 2.1.1.1 Facility level Percent distribution of system assessment indicators, by background characteristics, Ethiopia, 2018

back ground characteristics		Facility report health service data to government reporting system	Staff trained in data collection and compilation	Have written guidelines on reporting	Routine process for checking quality of reports	Copies of submitted reports for past 12 months available	Documented supervisory visit in past 6 months	Clear instructions on how to complete reporting forms	Number of facilities surveyed
Managing authority	Government/ Public	100	61	55	67	90	78	74	301
	NGO/not-for profit	91	59	38	81	74	61	59	3
	Private-for profit	83	17	15	16	71	52	26	319
	Mission/Faith based	100	29	21	29	100	26	31	3
Facility type	Referral hospital	97	73	87	93	97	70	97	3
	General hospital	100	79	80	75	91	74	84	9
	Primary hospital	100	75	69	84	90	77	81	13
	Health centre	100	60	53	66	89	78	73	281
	Private clinic	83	16	15	15	72	52	27	323
Region	Tigray	100	65	69	84	82	93	93	34
	Afar	93	31	42	23	73	51	38	10
	Amhara	100	37	33	36	75	60	47	154
	Oromia	81	32	26	35	91	52	53	196
	Somali	96	38	39	29	19	56	36	15
	Benishangul Gumuz	75	28	32	50	87	33	52	8
	S.N.N.P	92	41	37	49	89	80	40	136
	Gambella	89	12	16	19	59	22	23	11
	Harari	100	74	62	89	76	95	74	3
	Addis Ababa	93	41	36	34	87	83	48	57
	Dire Dawa	100	76	30	61	87	75	95	4
	Total	91	38	34	41	83	65	50	629

2.1.2. District/Woreda SA

2.1.2.1. Data management and reporting indicators

Table 2.1.2.1 shows district/Woreda level data management and reporting indicators.

- Overall 85 percent of districts/Woredas had trained staff to compile report data. This varied from 53 percent in Somali to all districts in Harari and Dire Dawa.
- Sixty eight percent of districts/Woredas had written guideline for reporting routine data. Districts in Somali, Gambella and Amhara regions are less likely to have written guideline for reporting routine data (40, 56 and 56 percent respectively).
- Sixty four percent of districts/Woredas had sufficient copies of blank forms that are available to meet the needs of all facilities. Districts in Somali region had the smallest proportion (30 percent).
- Seventy eight percent of districts/Woredas had available copies of report in that last 12 months submitted to higher level. It varies from 33 percent of districts/Woredas in Somali to 100 percent of districts in Harari, and Dire Dawa each.
- Seventy eight percent of districts/Woredas had archived monthly reports from facilities submitted to the district available for the last 12 months. Districts/Woredas in Somali (27 percent) were less likely to have archived monthly reports from facilities submitted to the district available for the last 12 months.
- Overall, eighty eight percent of district/Woreda had archive data organized and records easily retrievable.

Table 2.1.2.1 Woreda level service assessment data management and reporting indicators findings, DQR, Ethiopia, 2018

Region	Trained staff to compile report data	Written guideline for reporting routine data	Sufficient copies of blank forms are available to meet the needs of all facilities	Availability of copy of report submitted by the district in that last 12 months	Archived monthly reports from facilities submitted to the district available for the last 12 months	Archive data organized and recorded easily retrieved
Tigray	95	100	61	98	90	85
Afar	84	68	63	47	58	74
Amhara	86	56	67	64	81	92
Oromia	92	71	64	90	84	90
Somali	53	40	30	33	27	67
Benishangul Gumuz	65	76	71	71	76	94
S.N.N.P.	85	78	75	93	92	96
Gambella	78	56	78	56	56	67
Harari	100	100	67	100	100	67
Dire Dawa	100	70	100	100	100	100
Total	85	68	64	78	78	88

2.1.2.2. Data quality indicators

Table 2.1.2.2 shows district/Woreda level data quality indictors finding.

- Seventy two percent of district/Woreda monitor timeliness and completeness of reporting from facilities. It ranges from Woredas in Tigray (95 percent) to Woredas in Somali (27 percent) region.
- Fifty nine percent of districts/Woredas reported a routine process for checking the quality of data. Districts/Woredas in Somali (23 percent), and Gambella (22 percent) were less likely to have routine process for checking the quality of data.
- Written policy on when and how to conduct data quality checks was available in 55 percent of district/Woreda.
- Eight four percent of Woredas had designated staff for reviewing data quality. This percentage varied across the regions from 63 percent in Afar to all Woredas in Dire Dawa.

Table 2.1.2.2 Woreda level service assessment, data quality indicators findings, DQR, Ethiopia, 2018

Region	District monitors timeliness and completeness of reporting from facilities	Routine process in the district for checking data quality	Written policy at the district on when and how to conduct data quality checks	Designated staff for reviewing data quality
Tigray	95	93	83	95
Afar	74	37	32	63
Amhara	63	60	59	81
Oromia	83	58	52	86
Somali	27	23	17	67
Benishangul Gumuz	71	76	65	94
S.N.N.P.	81	74	68	95
Gambella	44	22	78	78
Harari	89	78	78	78
Dire Dawa	70	70	70	100
Total	72	59	55	84

2.1.2.3. Supportive supervision and information use indicators

Table 2.1.2.3 shows district/Woreda level supportive supervision and information use indicators.

- Ninety five percent of districts/Woredas reported that staff from district visited each facility at least once in past 12 months.

- Sixty seven percent of districts/Woredas had written documentation on the result of supervisory visits to facilities. This showed variation across the regions, from 22 percent in Gambella to the 95 percent in Tigray districts.
- Eighty four percent of districts/Woredas had supervisory visit conducted in the last 6 months, and65 percent of districts/Woredas provided written feedback to facilities on the quality of the data they reported.
- Ninety one percent of districts/Woredas had target population for priority indicators.
- Sixty eight percent of districts/Woredas made programmatic decisions on the basis of analysed data/results.

Table 2.1.2.3 Woreda level service assessment, supportive supervision and information use indicators findings, DQR, Ethiopia, 2018

Region	Staff from district visited each facility at least once in past 12 months	Written documentation on the result of supervisory visits to facilities	Supervisory visit conducted in last 6 months	Written feedback is provided to facilities on quality of reporting	District has target population for priority indicators	Programmatic decisions based on analyzed data
Tigray	98	95	83	90	98	80
Afar	95	32	74	37	84	58
Amhara	99	77	92	78	88	68
Oromia	92	64	79	59	90	57
Somali	91	27	83	25	84	57
Benishangul Gumuz	100	47	94	76	100	94
S.N.N.P.	100	88	90	86	93	90
Gambella	56	22	56	33	78	44
Harari	100	89	100	67	100	100
Dire Dawa	100	70	100	40	100	100
Total	95	67	84	65	91	68

2.1.2.4. Timeliness of report at woreda level

Figure 2.1.2.4.1 shows woreda level report timeliness by indicator and aggregate report for the three months (Hamle 2009, Nehase 2009, and Meskerem 2010).

- Reports received at woreda level by required date for all indicators were more than 95 percent.

Figure 2.1.2.4.1 percentage of facility that report to a woreda in a timely manner

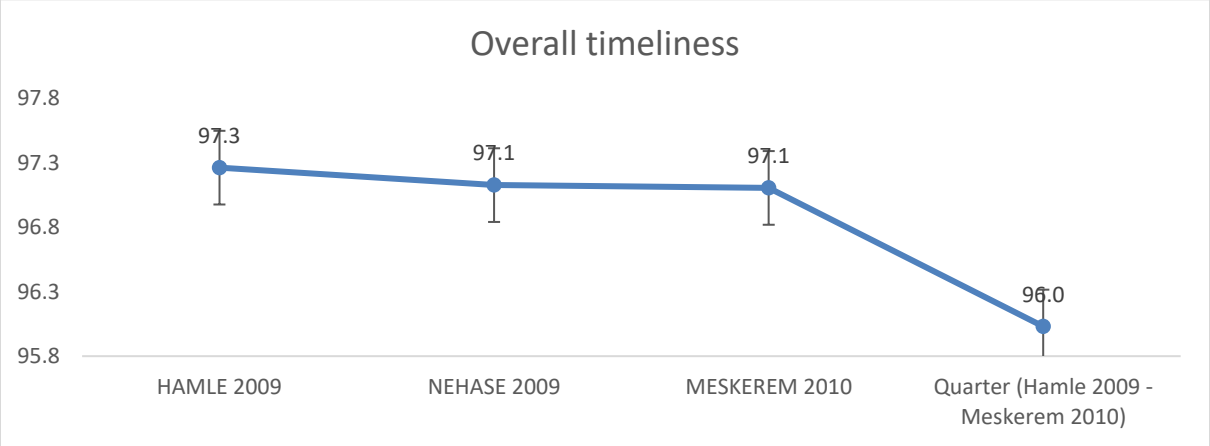
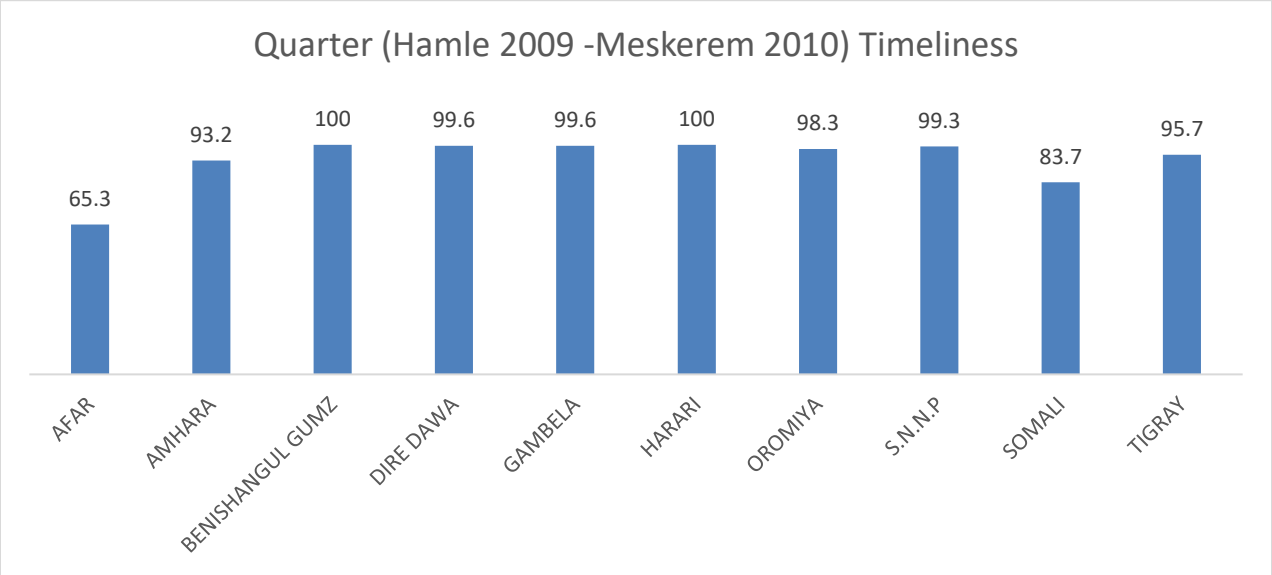


Figure 2.1.2.4.1 shows timeliness of report by region.

- All reports received at woreda level by required date except for woredas in Afar region (65 percent).

Figure 2.1.2.4.2 percentage of facilities that report in a timely manner at woreda level by region



2.1.1. Zonal SA

2.1.1.1. Data management and reporting indicators

Table 2.1.3.1 shows Zonal level data management and reporting indicators.

- Ninety one and 95 percent of zones had trained staffs responsible for reporting and written guideline on reporting, respectively. Zones in Gambella (33 percent) were less likely to have staff responsible for reporting has received training.
- Sufficient copies of blank forms were available to meet the needs of all facilities in 48 percent of the zones. Zones in Amhara region (18 percent) were less likely to have sufficient copies of blank forms.
- Eighty seven percent of zones had archived monthly reports and archived data organized and easily retrievable.
- None of the zones in Benishangul Gumuz and Gambella have copies of monthly reports submitted by the Zone to the next higher level available for the past 12 months.

Table 2.1.3.1. Zonal level service assessment data management and reporting indicators findings DQR, Ethiopia, 2018

Region	Staff responsible for reporting has received training	Have written guidelines on reporting	Sufficient copies of blank forms are available to meet the needs of all facilities	Copies of monthly reports submitted by the Zone available for the past 12 months	Archived monthly reports from facilities submitted to Zonal level	Archived data organized and records easily retrievable	SA 2018 Number of zones surveyed weighted
Amhara	100	91	18	73	73	73	11
Oromia	100	96	65	100	100	100	23

Benishangul Gumuz	67	100	33	0	0	33	3
S.N.N.P.	80	100	47	100	100	100	15
Gambella	33	67	33	0	33	33	3
Addis Ababa	100	100	38	100	100	88	8
Total	91	95	48	85	87	87	63

2.1.1.2. Data quality indicators

Table 2.1.3.2 shows Zonal level data quality indicators

- Eighty nine percent of zones monitored timeliness and completeness of reporting from facilities.
- Overall routine process for checking data quality at facilities was available in 76 percent of Zones.
- Eighty eight percent of Zones had written policy on when and how to conduct data quality checks and 86 percent had designated staff for reviewing data quality.

Table 2.1.3.2 Zonal level service assessment data quality indicators findings DQR, Ethiopia, 2018

Back ground characteristics	ZONE monitors timeliness and completeness of reporting from facilities	Routine process in the ZONE for checking data quality at facilities	Written policy at the ZONE on when and how to conduct data quality checks at facilities	Designated staff for reviewing data quality	SA 2018 Number of zones surveyed weighted
Amhara	100	91	100	91	11
Oromia	100	83	96	100	23
Benishangul Gumuz	33	33	100	33	3
S.N.N.P.	87	67	67	93	15
Gambella	33	33	33	0	3
Addis Ababa	88	88	88	75	8
Total	89	76	88	86	63

2.1.1.3. Supportive supervision and information use indicators

Table 2.1.3.3 shows Zonal level supportive supervision and information use indicators

- Overall 83 percent of zones had written documentation on the result of supervisory visits to facilities.
- Seventy nine percent of zones had supervisory visit conducted by higher authority in last 6 months.
- Ninety seven percent of zones had target population for priority indicators.
- One third of zones in Benishangul had written documentation on the result of supervisory visits to facilities and supervisory visit conducted by higher level to the zones in last 6 months and none of the zones had provided written feedback on quality of reporting to facilities.
- None of the zones in Gambella had written documentation on the result of supervisory visits to facilities and only one third had provided written feedback on quality of reporting

Table 2.1.3.3 Zonal level service assessment supportive supervision and information use indicators findings DQR, Ethiopia, 2018

Back ground characteristics	Staff from ZONE visited each WOREDA at least once in past 12 months	Written documentation on the result of supervisory visits to facilities	Supervisory visit conducted in last 6 months	Written feedback is provided to facilities on quality of reporting	ZONE has target population for priority indicators	Programmatic decisions based on analyzed data	SA 2018 Number of zones surveyed weighted
Amhara	100	82	82	100	100	73	11
Oromia	96	87	74	91	100	87	23
Benishangul Gumuz	67	33	33	0	100	67	3
S.N.N.P.	100	100	100	87	100	67	15
Gambella	100	0	100	33	67	0	3

Addis Ababa	88	100	75	75	88	75	8
Total	95	83	79	82	97	75	63

2.1.2. Regional SA

2.1.2.1. Data management and reporting indicators

Table 2.1.4.1 shows regional level data management and reporting indicators

- All regions had trained staff responsible for reporting, written guidelines on reporting, and archived data organized and records easily retrievable.
- Forty five percent of the regions had sufficient copies of blank forms available.
- Amhara, Somali, and Benishangul Gumuz regions had no copies of monthly reports submitted by the region to the next higher level available for the past 12 month.

Table 2.1.4.1 Regional level system assessment, data management and reporting indicators, DQR, Ethiopia, 2018

Region	Staff responsible for reporting has received training	There are written guidelines on reporting	Sufficient copies of blank forms are available to meet the needs of all facilities	Copies of monthly reports submitted by the REGION available for the past 12 month	Archived monthly reports from facilities submitted to the REGION available for the last 12 months	Archived data organized and records easily retrievable
Tigray	100	100	0	100	100	100
Afar	100	100	100	100	100	100
Amhara	100	100	0	0	0	0
Oromia	100	100	0	100	100	100
Somali	100	100	100	100	0	100
Benishangul Gumuz	100	100	0	0	0	100
S.N.N.P.	100	100	100	100	100	100
Gambella	100	100	0	100	100	100
Harari	100	100	100	100	100	100
Addis Ababa	100	100	0	100	100	100
Dire Dawa	100	100	100	100	100	100
Total	100	100	45	82	73	91

2.1.2.2. Data Quality indicators

Table 2.1.4.2 shows regional level data quality indictors findings

- All regions monitor timeliness and completeness of reporting from facilities, and had written policy on when and how to conduct data quality checks, and designated staff responsible for reviewing the quality of data.
- Except Afar region and Addis Ababa city administration all had routine process for checking data quality.

Table 2.1.4.2. Regional level system assessment, quality of data indicators, DQR, Ethiopia, 2018

Region	REGION monitors timeliness and completeness of reporting from facilities	Routine process in the REGION for checking data quality at facilities	Written policy at the REGION on when and how to conduct data quality checks at facilities	designated staff responsible for reviewing the quality of data
Tigray	100	100	100	100
Afar	100	0	100	100
Amhara	100	100	100	100
Oromia	100	100	100	100
Somali	100	100	100	100
Benishangul Gumuz	100	100	100	100
S.N.N.P.	100	100	100	100
Gambella	100	100	100	100

Harari	100	100	100	100
Addis Ababa	100	0	100	100
Dire Dawa	100	100	100	100
Total	100	82	100	100

2.1.2.3. Supportive supervision and information use indicators

Table 2.1.4.3 shows regional level system assessment supportive supervision and information use indicators

- Staff member from all regions visited each Zone at least once in past 12 months, provided written feedback on quality of reporting to zones, and had target populations for priority indicators.
- All regions except Amhara, had written documentation on the results of supervisory visits conducted in zones.
- Higher authorities had not conducted supervisory visits in last six months in Tigray, Amhara, Benishangul Gumuz, and SNNP region.
- Gambella region had not made programmatic decisions based on analysed data/results.

Table 2.1.4.3. Regional level system assessment, supportive supervision and information use indicators, DQR, Ethiopia, 2018

Region	Staff from REGION visited each ZONE at least once in past 12months	written documentation on the results of supervisory visits conducted in zones	Supervisory visit conducted in last 6 months	Written feedback is provided to facilities on quality of reporting	region have target populations for priority indicators	programmatic decisions taken by the region based on analyzed data/results
Tigray	100	100	0	100	100	100
Afar	100	100	100	100	100	100
Amhara	100	0	0	100	100	100
Oromia	100	100	100	100	100	100
Somali	100	100	100	100	100	100
Benishangul Gumuz	100	100	0	100	100	100
S.N.N.P.	100	100	0	100	100	100
Gambella	100	100	100	100	100	0
Harari	100	100	100	100	100	100
Addis Ababa	100	100	100	100	100	100
Dire Dawa	100	100	100	100	100	100
Total	100	91	64	100	100	91

Figure 2.1.4.1, 2.1.4.2 and 2.1.4.3 shows the trend in system assessment indicators by health unit.

- Almost all indicators the proportion of units with the desired outcome increases except for copies of submitted reports in the last 12 months and supervisory visit conducted in the last six months with an increase in health unit. i.e. as we go from Facility to regional health bureau level.

Figure2.1.4.1. Comparison of system assessment indicators by health unit

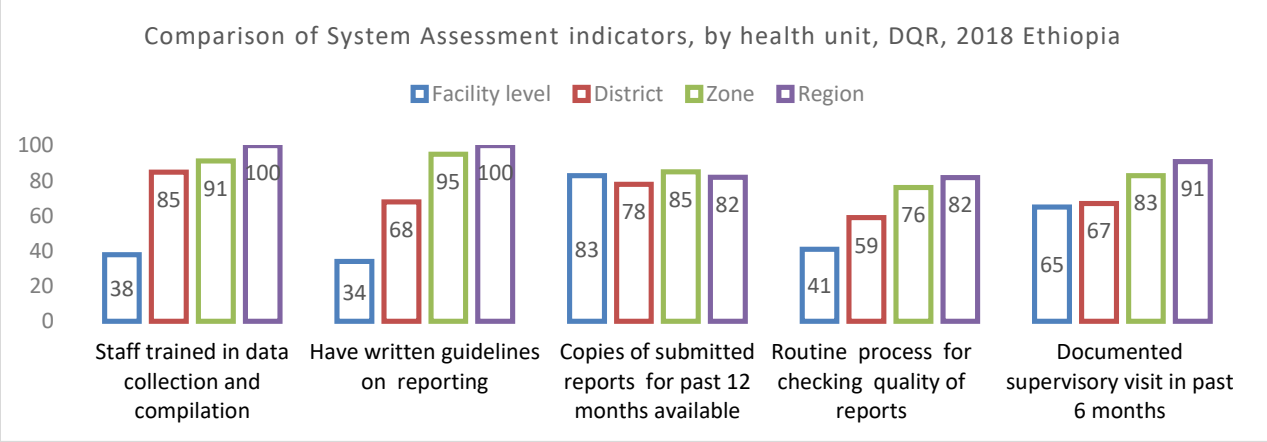


Figure2.1.4.2 Comparison of system assessment indicators data quality indicators by health unit

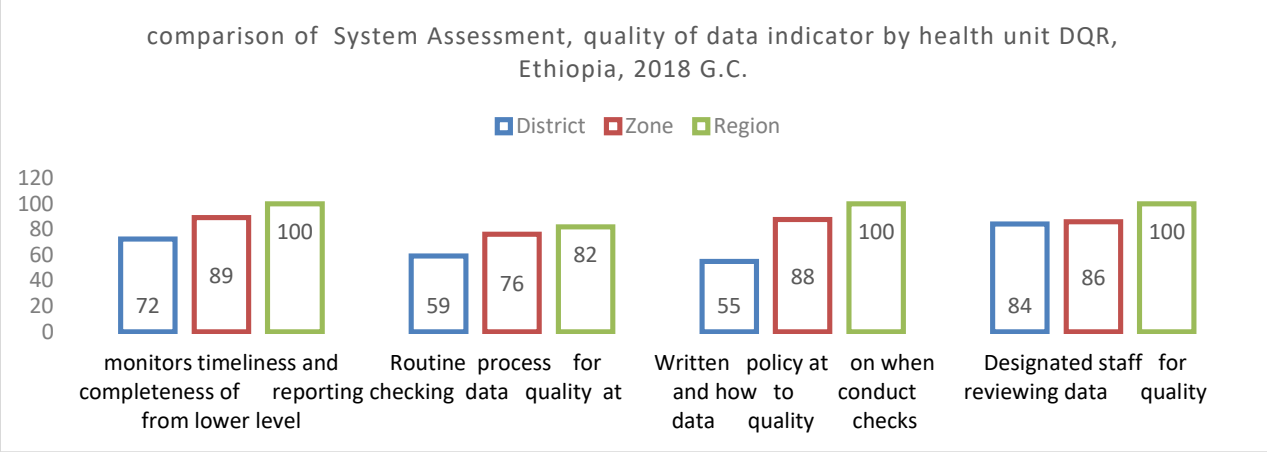
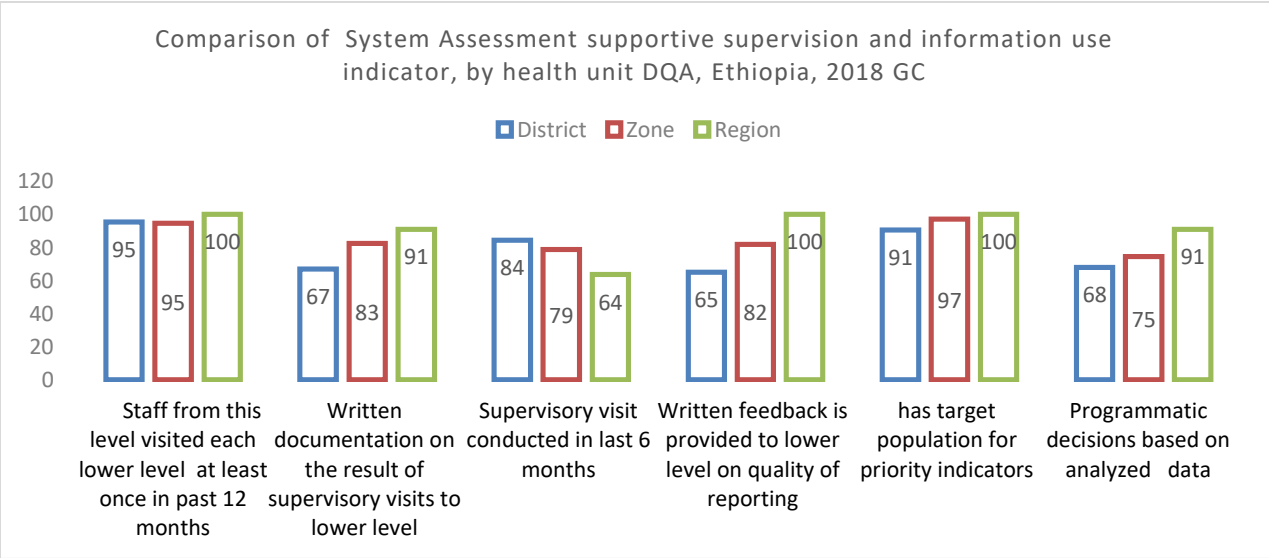


Figure2.1.4.3. Comparison of system Assessment supportive supervision and information use indicator by health unit



2.2. Data verification (DV) Findings

The facility data verification verifies the availability of specific services provided at the facility level followed by verification of source documents and reports on the seven recommended core indicators (Antenatal care first visit, institutional deliveries, Pentavalent/DTP third doses in children under one year, PMTCT coverage, TB cases, Confirmed malaria cases, and Contraceptive accepters). The Woreda, Zone and regional DV compare the figures reported of the same indicators at the preceding level. It includes reporting performance, data verification and re-aggregation of monthly report values from preceding level.

The purpose of this part was to assess if:

1) Service delivery and intermediate aggregation sites are collecting and reporting data accurately, completely and on time, and

2) Whether the data agrees with reported results from the source document.

A verification factor (VF) of < 1 indicates a lower numbers were recorded as being provided at lower health-service or administration levels than are reflected in the number sent to next levels (over reporting). Conversely, a VF > 1 indicates that a higher numbers were recorded as being provided at lower health-service or administration levels than are reflected in the number sent to next levels (underreporting). Data verification was done by comparing health facility source documents to health information management system report data to determine the proportion of the reported numbers that can be verified from the source documents. It checks whether the information contained in the source documents has been transmitted correctly to the next higher level of reporting, for each level of reporting, from the health facility level to the national level.

2.2.1. Facility level DV

2.2.1.1. Antenatal care (ANC)

Table 2.2.1.1.1 summarizes facility level first visit of antenatal care (ANC 1) data verification and data verification category by background characteristics.

- Overall, about two third of the facilities offered ANC services.
- Of the facilities that offered ANC 1 services95 percent reported ANC 1 data to government HMIS system.
- All hospitals, 97 percent of health centres, and 83 percent of private clinics reported ANC 1 data to government HMIS system.
- All NGO/private not for profit and mission/faith based facilities, 97 percent of public facilities, and 83 percent of private for profit facilities reported ANC 1 data to government HMIS system.
- About two third of facilities had source documents and reports available for ANC 1.
- Private/ for profit (33 percent) and mission/ Faith based (27 percent) facilities were less likely to have source documents and reports available for ANC 1.
- All facilities in Dire Dawa had source documents and reports available for ANC 1 compared with facilities in Gambella (41 percent), and Somali regions (44 percent).
- The completeness of ANC 1 data among facilities that provide ANC service were 84 percent.
- All referral hospitals, 97 percent general hospital, 94 percent primary hospital, and 94 percent health centres had complete ANC 1 data compared with one third of private clinics.

- All facilities in Harari region and Dire Dawa city administration council had complete ANC 1 data compared with53 percent of facilities in Somali region.
- The ANC 1 report matched with source document nationally in 52 percent of the facilities.
- Sixty eight percent of private clinics and about half of referral and general hospitals, and health centres had ANC 1 report matched with source document.
- About half of the facilities in SNNP (46 percent), Benishangul Gumuz (49 percent), and Amhara (49 percent) had ANC 1 report matched with source document.
- The overall verification factor (VF) for ANC 1 data was 0.92931 indicating over reporting of ANC 1 data to the next level.

Table 2.2.1.1. 1. Facility level ANC 1data verification indicators by background characteristics, DQR, Ethiopia 2018

Background characteristics	Facility provide ANC services	ANC reporting system HMIS	All source docs & reports are available	ANC reporting completeness	Matched	Verification Factor (VF)
Managing authority						
Government/Public	99	97	73	94	51	0.9244073
NGO/not-for profit	93	100	91	94	59	1.0067920
Private-for profit	27	83	33	34	68	0.9997132
Mission/Faith based	88	100	27	97	40	0.9761482
Facility type						
Referral hospital	100	100	79	100	52	0.9986525
General hospital	99	99	84	97	55	0.9926128
Primary hospital	99	99	82	94	46	0.9973983
Health centre	100	97	73	94	52	0.9381744
Private clinics	27	83	29	33	68	1.0100780
Region						
Tigray	84	100	92	92	62	.936661
Afar	86	100	64	83	53	.9801503
Amhara	69	94	56	75	49	.8710945
Oromia	77	91	64	85	54	.9380241
Somali	91	94	44	53	57	.8132828
Benishangul Gumuz	65	100	68	90	49	.9939953
S.N.N.P	54	100	76	92	46	.9529819
Gambella	55	100	41	86	60	.9572876
Harari	65	100	96	100	50	.9993681
Addis Ababa	31	100	74	99	53	.9552781
Dire Dawa	43	88	100	100	64	1.0039240
Total	66	95	66	84	52	0.92931

Table 2.2.1.1.2 describes ANC 1 data verification category.

- Seventy nine percent of facilities for ANC 1 report were within the acceptable range of matched +/- ten percent.
- Nineteen percent of the facilities showed greater than ten percent over reporting and three percent showed greater than ten percent under reporting of ANC 1 data.
- Government (19 percent) and private for profit (17 percent) facilities were more likely to make greater than ten percent over reporting of ANC 1 data.
- Health centres (20 percent) and private clinics (18 percent) were more likely to make greater than ten percent over reporting of ANC 1 data. On the other hand, primary hospitals (9 percent) were more likely to make greater than ten percent under reporting.
- Facilities in Amhara region (32 percent) were more likely to make greater than ten percent over reporting of ANC 1 data followed by SNNP (29 percent), Gambella and Somali (27 percent each), Addis Ababa (23 percent), and Afar (15 percent).
- Facilities in Afar region (20 percent) were more likely to make greater than ten percent under reporting of ANC 1 data followed by Gambella region (13 percent).

Table 2.2.1.1.2. Facility level ANC 1data verification category by background characteristics, DQR, Ethiopia 2018

Verification category	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government	19	16	51	11	3
NGO/not- for profit	3	10	59	29	0
Private- for profit	17	9	68	2	4
Mission/ faith based	10	40	40	0	10
facility type					
Referral hospital	4	22	52	17	4
General hospital	9	17	55	14	5
Primary hospital	10	18	46	17	9
Health centre	20	16	52	11	2
Private clinics	18	11	68	2	2
Region					
Tigray	6	20	62	11	1
Afar	15	9	53	2	20
Amhara	32	17	49	2	0
Oromia	9	18	54	18	0
Somali	27	3	57	13	0
Benishangul Gumuz	0	34	49	17	0
SNNP	29	8	46	8	8
Gambella	27	0	60	0	13
Harari	12	8	50	30	0
Addis Ababa	23	19	53	4	1
Dire Dawa	0	12	64	18	6
Total	19	16	52	11	3

2.2.1.2. Delivery

Table 2.2.1.2.1 summarizes facility level delivery data verification and data verification category by background characteristics.

- Overall55 percent of facilities offered delivery services.
- Ninety six percent of facilities that offered delivery service reported to Government HMIS system.
- Seventy eight percent of facilities had delivery source documents and reports available.
- Seventy nine percent of health centres had delivery source documents and reports available.
- Private clinics (43 percent) are less likely to have delivery source documents and reports available.
- Forty eight percent of NGO/not for profit facilities had source documents and reports available for delivery.
- Facilities in Somali (44 percent) and Benishangul Gumuz (53 percent) region were less likely to have delivery source documents and reports available.
- The completeness of delivery data among facilities that offered delivery service and reported through HMIS was92 percent.
- About nine out of ten hospital and health centre had complete delivery data.
- Only 45 percent of private clinics had complete delivery data.
- All facilities in Tigray, Benishangul Gumuz and SNNP regions had complete data compared with about half of the facilities in Somali region.
- Overall the delivery report matched with source document in half of the facilities.
- Facilities managed by NGO/ not for profit (93 percent), Primary hospitals (67 percent), and Tigray region (91 percent) facilities had delivery report that matched with source document.

- The overall Verification Factor (VF) for the delivery data was 0.9740 indicating over reporting of delivery data to the next level.

Table 2.2.1.2.1. Facility level delivery data verification indicators by background characteristics, DQR, Ethiopia 2018

Background characteristics	Facility provide delivery services	Delivery reporting system HMIS	All source docs & reports are available	DEL reporting completeness	Matched	VF
Managing authority						
Government/Public	99	96	79	94	50	0.97439
NGO/not-for profit	82	100	48	100	93	0.98695
Private-for profit	6	99	54	57	56	0.93967
Mission/Faith based	26	100	91	91	30	0.97162
Facility type				0		
Referral hospital	100	100	72	99	52	0.96513
General hospital	99	99	82	95	53	0.98712
Primary hospital	99	99	82	95	67	0.98711
Health centre	100	96	79	94	49	0.97374
Private clinics	4	100	43	45	53	0.83505
Region				0		
Tigray	67	100	94	100	91	0.99450
Afar	66	100	77	86	57	0.94956
Amhara	50	100	66	90	51	0.95976
Oromia	71	94	75	92	43	0.97424
Somali	88	88	44	53	54	0.90654
Benishangul Gumuz	60	100	53	100	40	0.94317
S.N.N.P	50	94	99	100	44	0.98082
Gambella	36	100	59	82	73	1.00537
Harari	35	100	79	91	36	1.00610
Addis Ababa	23	100	86	98	49	1.00123
Dire Dawa	38	100	93	95	45	0.97792
Total	55	96	78	92	50	0.97400

Table2.2.1.2.2. shows facility level delivery data verification factor category by back ground characteristics.

- Eighty nine percent of facilities had delivery report that was within the acceptable range of matched +/- ten percent.
- Eleven percent of the facilities showed over reporting of greater than ten percent; on the other hand one percent showed under reporting of greater than ten percent.
- Greater than ten percent over reporting was observed in 29 percent of facilities that are managed by private for profit followed by Government and mission/ faith based facilities (10 percent).
- Private clinics (47 percent) were more likely to report greater than ten percent over reporting.
- Facilities in Benishangul Gumuz (24 percent) were more likely to over report greater than ten percent followed by Addis Ababa (20 percent), Harari and SNNP (18 percent each), and Afar (17 percent).
- Facilities in Dire Dawa (22 percent), are more likely to under report greater than ten percent followed by Benishangul Gumuz (12 percent).

Table 2.2.1.2.2.Facilitydelivery verification factor category by background characteristics, DQR, Ethiopia 2018

Background characteristics	Verification category				
	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government/Public	10	29	50	10	1
NGO/not-for profit	7	0	93	0	0
Private-for profit	29	3	56	4	7
Mission/Faith based	10	40	30	10	10

Facility type					
Referral hospital	10	29	52	10	0
General hospital	5	18	53	15	9
Primary hospital	5	16	67	6	5
Health centre	11	30	49	10	0
Private clinics	47	0	53	0	0
Region					
Tigray	0	8	91	1	0
Afar	17	18	57	0	8
Amhara	9	16	51	23	0
Oromia	8	48	43	0	0
Somali	15	18	54	13	0
Benishangul Gumuz	24	24	40	0	12
S.N.N.P	18	25	44	13	1
Gambella	0	13	73	13	0
Harari	18	18	36	18	9
Addis Ababa	20	9	49	18	4
Dire Dawa	7	20	45	5	22
Total	11	29	50	10	1

2.2.1.3. DPT-HepB-Hib3 (Penta3)

Table 2.2.1.3.1summarizes facility level Penta 3 data verification indicators by background characteristics.

- Overall forty nine percent of facilities offered Expanded Program for Immunization (EPI) services.
- Ninety eight percent of facilities that offered EPI service reported to Government HMIS system.
- Seventy five percent of facilities had all source documents and reports available for Penta 3.
- Facilities managed by government/public (75 percent) and health centres (74 percent) were less likely to have Penta3 source documents and reports.
- The completeness of Penta 3 data among facilities that offered EPI service and reported through HMIS was96percent; these varied from all facilities managed by NGO/not for profit to 89 percent of mission/faith based facilities.
- Completeness of Penta3 data was universal in SNNP, Harari, Amhara, and Addis Ababa facilities compared with61 percent of facilities in Somali.
- ThePenta3 report matched with source document in about half of the facilities. Private for profit (67 percent) facilities were more likely to havePenta3 report that matched with source document.
- Referral hospitals (61 percent) were more likely to have matched Penta3 report with source document followed by primary hospital (58 percent).
- Dire Dawa and Addis Ababa (82 percent each) and Benishangul Gumuz (81 percent) facilities had the largest proportion of facilities with Penta3 report that matched with source.
- The overall VF for the Penta3 data was 1.0296 indicating under reporting to next level.

Table 2.2.1.3.1 Facility level PENTA3 data verification indicators by background characteristics, DQR, Ethiopia 2018

Background characteristics	Facility provide immunization services	EPI reporting system HMIS	All source docs & reports are available	EPI reporting completeness	Matched	VF
Managing authority						
Government/Public	92	98	75	96	51	1.0315
NGO/not-for profit	88	100	100	100	42	0.9192
Private-for profit	1	100	79	93	67	1.0179
Mission/Faith based	21	100	89	89	29	0.9860
Facility type						
Referral hospital	90	100	88	100	61	0.9900
General hospital	75	100	87	93	53	0.9881
Primary hospital	79	100	87	95	58	0.9688
Health centre	94	97	74	96	50	0.9960

Private clinics	0	100	100	100	0	0.3295
Region						
Tigray	52	100	93	93	56	1.0083
Afar	68	100	62	84	42	0.9656
Amhara	40	100	80	100	29	1.1776
Oromia	71	94	70	98	55	0.9732
Somali	84	100	48	61	64	0.9045
Benishangul Gumuz	60	100	79	98	81	0.9395
S.N.N.P	43	100	80	100	54	1.0117
Gambella	24	100	48	84	57	1.0157
Harari	35	100	100	100	21	0.9536
Addis Ababa	18	100	92	99	82	1.0030
Dire Dawa	36	100	80	96	82	0.9850
Total	49	98	75	96	51	1.0296

Table 2.2.1.3.2 shows facility level Penta3 verification factor category by background characteristics.

- Seventy five percent of facilities hadPenta3 reports that were within the acceptable range of matched +/- ten percent.
- Greater than ten percent over reporting was observed in 14 percent of Government/public and mission/faith based, and 13 percent of NGO/private for profit and six percent of private for not profit facilities.
- Greater than ten percent under reporting was observed in 14 percent of mission/faith based, followed by 13 percent of private for profit, and 12 percent of government/public facilities
- Greater than ten percent over reporting was observed in all private clinics.
- Harari region has the largest proportion (28 percent) of facilities with greater than ten percent over reporting.
- Amhara region has the largest proportion (26 percent) of facilities with greater than ten percent under reporting, followed by Harari (22 percent), SNNP and Tigray (17 percent each), Somali (15 percent) and Gambella (14 percent).
- There was no greater than ten percent over reporting from facilities in Gambella and no greater than ten percent under reporting from facilities in Benishangul Gumuz and Dire Dawa.

Table 2.2.1.3.2. Facility level Penta3 verification factor category by background characteristics, DQR, Ethiopia 2018

Background characteristics	Verification category				
	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government/Public	14	16	51	8	12
NGO/not-for profit	6	0	42	46	6
Private-for profit	13	7	67	0	13
Mission/Faith based	14	0	29	43	14
Facility type					
Referral hospital	9	17	61	9	4
General hospital	12	15	53	8	12
Primary hospital	11	14	58	7	10
Health centre	14	16	50	8	12
Private clinics	100	0	0	0	0
Region					
Tigray	1	4	56	23	17
Afar	19	19	42	12	9
Amhara	18	18	29	9	26
Oromia	18	18	55	9	1
Somali	20	2	64	0	15
Benishangul Gumuz	16	3	81	0	0
S.N.N.P	10	18	54	1	17
Gambella	0	0	57	29	14
Harari	28	29	21	0	22

Addis Ababa	2	6	82	8	3
Dire Dawa	9	9	82	0	0
Total	14	16	51	8	12

2.2.1.4. Prevention of mother to child transmission (PMTCT)

Table 2.2.1.4.1summarizes facility level PMTCT data verification indicators by background characteristics.

- Forty six percent of facilities offered PMTCT services.
- Ninety seven percent of facilities that offered PMTCT service reported to government HMIS system.
- Nationally 77 percent of facilities had source documents and reports for PMTCT.
- Almost all facilities in S.N.N.P have source documents and reports for PMTCT followed by facilities in Dire Dawa (95 percent); and Harari and Addis Ababa (87 percent each).
- The completeness of PMTCT data among facilities that offered PMTCT service and reported through HMISwas88 percent, while all referral hospitals and facilities in Benishangul Gumuz had complete data for PMTCT.
- Nationally PMTCT report matched with source document in 72 percent of facilities.
- All facilities under NGO/not for profit facilities had PMTCT report that matched with source document; and about three fourth of government/public and mission/faith based institutions respectively.
- All private clinics PMTCT report matched with source document compared with about six to seven out of ten facilities for the other facility type.
- Facilities in SNNP (60 percent), were less likely to have matched PMTCT report with source document followed by Gambella (62 percent), Afar and Somali (63 percent) and Amhara (65 percent) regions.
- The overall VF for the PMTCT data was 0.6390 indicating significant over reporting to next level.

Table 2.2.1.4.1. Facility level PMTCT data verification indicators by background characteristics, DQR, Ethiopia 2018

Background characteristics	Facility provide PMTCT service	PMTCT reporting system HMIS	All source docs & reports are available	PMTCT reporting completeness	Matched	VF
Managing authority						
Government/Public	83	97	77	88	71	0.6345
NGO/not-for profit	88	100	23	72	100	1.0000
Private-for profit	3	99	84	91	94	0.9131
Mission/Faith based	26	100	91	91	75	1.8038
Facility type						
Referral hospital	100	100	90	100	77	1.0063
General hospital	94	99	88	95	67	0.8627
Primary hospital	91	99	78	90	64	0.9754
Health centre	83	97	76	88	71	0.8377
Private clinics	2	100	91	95	100	1.0000
Region						
Tigray	67	100	86	93	82	0.8498
Afar	38	100	51	74	63	2.5675
Amhara	43	100	56	88	65	0.9784
Oromia	63	92	76	81	77	0.2711
Somali	32	98	77	77	63	1.0104
Benishangul Gumuz	60	100	56	100	73	1.2259
S.N.N.P	35	100	99	99	60	0.6449
Gambella	24	100	48	70	62	1.1160
Harari	59	100	87	93	90	1.0075
Addis Ababa	23	100	87	98	77	0.9596

Dire Dawa	38	100	95	98	92	1.4910
Total	46	97	77	88	72	0.6390

Table 2.2.1.4.2 shows facility level PMTCT verification factor categories by background characteristics.

- Seventy seven percent of facilities had PMTCT reports that were within the acceptable range of matched +/- ten percent.
- At national level16percent and 7 percent of facilities showed greater than ten percent over and under reporting respectively.
- None of facilities managed by NGO/ not for profit, and mission/faith based facilities had report greater than ten percent over reported.
- Government/ public (17 percent) institutions were more likely to have over reporting greater than ten percent. On the other hand, quarter of mission/ faith based facilities had under reporting greater than ten percent.
- Health centres (17 percent) had the largest proportion of greater than ten percent over reporting.
- Eighteen percent of General hospitals, 15% percent of referral hospitals and 14% of Primary hospitals had greater than ten percent under reporting.
- None of the private clinics and six percent of health centres had greater than ten percent under reporting. All other facility types had under reporting of 14 to 18 percent.
- Facilities from Dire Dawa, Harari, Gambella, Benishangul Gumuz, and Afar region had no greater than ten percent over reporting, while facilities in Addis Ababa, Oromia and S.N.N.P were more likely to have greater than ten percent over reporting (22, 21, and 20 percent) respectively.
- Facilities in Gambella region (38 percent) were more likely to under report greater than ten percent followed by facilities from Afar region (37 percent).
- None of facilities from Somali and one percent of facilities from Tigray, Oromia and Addis Ababa had PMTCT greater than ten percent under reporting.

Table 2.2.1.4.2. Facility PMTCT verification factor categories by background characteristics, DQR, Ethiopia 2018

Background characteristics	Verification category				
	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government/Public	17	0	71	6	7
NGO/not-for profit	0	0	100	0	0
Private-for profit	4	0	94	1	1
Mission/Faith based	0	0	75	0	25
Facility type					
Referral hospital	4	0	77	4	15
General hospital	12	1	67	1	18
Primary hospital	12	3	64	8	14
Health centre	17	0	71	6	6
Private clinics	0	0	100	0	0
Region					
Tigray	15	2	82	0	1
Afar	0	0	63	0	37
Amhara	2	0	65	17	17
Oromia	21	0	77	0	1
Somali	4	0	63	33	0
Benishangul Gumuz	0	0	73	0	27
S.N.N.P	20	0	60	9	12
Gambella	0	0	62	0	38
Harari	0	0	90	0	10

Addis Ababa	22	0	77	0	1
Dire Dawa	0	0	92	0	8
Total	16	0	72	5	7

2.2.1.5. Tuberculosis (TB)

Table 2.2.1.5.1summarizes Facility level TB data verification indicators by background characteristics.

- Overall62 percent of facilities offered TB diagnosis and/or treatment services.
- Ninety six percent of facilities that offered TB diagnosis and/or treatment service reported to government HMIS system.
- Ninety percent of facilities had source documents and reports available for TB
- Ninety six percent of private-for-profit facilities and 90 percent of Government/public facilities had all source documents and reports for TB diagnosis and/or treatment.
- One third of mission/faith based, and half of NGO/ not for profit facilities had all source documents and reports available for TB diagnosis and/or treatment.
- All Referral hospitals, and about nine out of ten of all other facility types had all source documents and reports available for TB diagnosis and/or treatment.
- All regions except Somali (66 percent) and Gambella (77 percent) had more than eight in ten facilities with all source documents and reports available for TB diagnosis and/or treatment.
- The completeness of TB data among facilities that provide TB service and reported through HMIS was 95percent
- All NGO/ not for profit and more than nine out of ten Government and private for profit facilities had complete TB data while only 32 percent of mission/faith based facilities had complete TB data.
- Almost all hospitals and health centres each, and 92 percent of private clinics have complete TB data.
- Amhara and SNNP had all facilities with complete TB data. Somali region has the lowest proportion (68 percent) of facilities with complete TB data; all other regions had more than eight in ten with complete TB data.
- Nationally 84 percent of TB report matched with source document
- Ninety three percent of mission/faith based facilities had TB report that matched with source document followed by government facilities (85 percent).
- NGO/ not for profit facilities had the lowest proportion of facilities (31 percent) with TB report that matched with source document.
- Health centres had the largest proportion (85 percent) of facilities with TB report that matched with source document followed by private clinics (79 percent) and primary hospitals (76 percent).
- The smallest proportion of facilities with TB report that matched with source document were recorded in Afar (41 percent), and Somali (52 percent).
- The overall VF for the TB data was 0.89911 indicating over reporting to the next level.

Table 2.2.1.5.1. Facility TB data verification factors indicators by background characteristics, DQR, Ethiopia 2018

Background characteristics	Facility provide TB diagnosis and/or treatment	TB reporting system HMIS	All source docs & reports are available	TB reporting completeness	Matched	VF
Managing authority						

Government/Public	97	98	90	96	85	0.90548
NGO/not-for profit	82	100	51	100	31	0.62272
Private-for profit	22	87	96	96	79	0.93226
Mission/Faith based	100	100	32	32	93	0.91110
Facility type						
Referral hospital	93	100	100	100	64	1.33539
General hospital	97	99	93	96	68	0.95102
Primary hospital	92	100	92	97	76	0.93620
Health centre	98	98	89	96	85	0.90357
Private clinics	21	87	92	92	79	0.83333
Region						
Tigray	77	100	85	90	75	1.04258
Afar	58	100	89	89	41	0.76991
Amhara	53	100	81	100	72	0.69068
Oromia	74	94	94	94	99	0.98549
Somali	59	100	66	68	52	1.02027
Benishangul Gumuz	71	100	84	84	91	1.02346
S.N.N.P	62	93	100	100	77	0.92519
Gambella	35	82	77	86	91	0.98766
Harari	82	100	90	93	67	0.82897
Addis Ababa	42	100	88	90	92	1.02530
Dire Dawa	75	100	93	93	79	0.91565
Total	62	96	90	95	84	0.89911

Table 2.2.1.5.2 shows Facility level TB verification factor categories by background characteristics.

- Eighty five percent of facilities had TB reports that were within the acceptable range of matched +/- ten percent.
- Overall 12 and 4 percent of facilities had over reporting and under reporting greater than ten percent respectively.
- About six in ten NGO/ not for profit facilities had greater than ten percent over reporting. While 15 and 11percent of private for profit and government facilities respectively had greater than ten percent over reporting.
- All facility types had more than ten percent of their reports with greater than ten percent over reporting, with the larger proportion in referral hospitals (20 percent), followed by private clinics (16 percent) and primary hospitals (15 percent).
- Facilities in Afar (42 percent), Harari (33 percent), Amhara (27 percent), Somali (20 percent), and SNNP (17 percent) regions had the larger proportion of facilities with greater than ten percent over reporting.
- None of the NGO/ not for profit and mission/faith based facilities had reports that were greater than ten percent under reported.
- Across the regions the largest proportion of facilities with under reporting was observed in Tigray (22 percent) region followed by facilities in Somali (14 percent).

Table 2.2.1.5.2. Facility level TB verification factor categories by background characteristics, Ethiopia, 2018

Background characteristics	Verification category				
	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government/Public	11	1	85	0	3
NGO/not-for profit	62	7	31	0	0
Private-for profit	15	0	79	0	5
Mission/Faith based	7	0	93	0	0
Facility type					
Referral hospital	20	8	64	0	8

General hospital	12	7	68	4	10
Primary hospital	15	2	76	2	6
Health centre	11	1	85	0	3
Private	16	0	79	0	5
Region					
Tigray	1	1	75	1	22
Afar	42	0	41	8	8
Amhara	27	0	72	0	0
Oromia	1	0	99	0	0
Somali	20	14	52	2	14
Benishangul Gumuz	7	0	91	0	3
S.N.N.P	17	0	77	0	6
Gambella	6	3	91	0	0
Harari	33	0	67	0	0
Addis Ababa	3	3	92	0	3
Dire Dawa	11	6	79	4	0
Total	12	1	84	0	4

2.2.1.6. Malaria

Table 2.2.1.6.1 summarizes Facility level malaria data verification indicators by background characteristics.

- Nationally76 percent of the facilities offered malaria services.
- Ninety three percent of facilities that offered malaria service reported to Government HMIS system.
- The proportion of facilities that had all source documents and reports for malariawas71 percent.
- Seventy seven and 70 percent of government and NGO/not for profit facilities had all source documents and reports for malaria.While32 percent of mission/faith based facilities had all source documents and reports for malaria.
- Referral hospitals had the larger proportion of facilities (93 percent) that had all source documents and reports for malaria compared with55 percent of private clinics had all source documents and reports for malaria.
- The completeness of malaria data among facilities that provide malaria service and reported through HMIS was81percent.
- Ninety four percent of mission/faith based followed by 91 percent of NGO/not-for profit facilities had complete malaria data.
- Private for profit facilities had the lowest proportion of facilities (61 percent) with complete malaria data.
- All referral hospitals and more than ninety three percent of general and primary hospitals had complete malaria data. While 61percent of private clinics had complete Malaria data.
- Except Gambella (48 percent) and Somali (58 percent), all other regions had greater than three quarters of their facilities with complete malaria data.
- At national level 66 percent of facilities had malaria report that matched with source document.
- All NGO/not for profit facilities had Malaria report that matched with source document.
- Primary hospitals had the smallest proportion of facilities (49 percent) with malaria report that matched with source document.
- All facilities from Dire Dawa and 84 percent from Gambella region had malaria report that matched with source document.

- The overall VF for the Malaria data was 0.89723 indicating over reporting of malaria data to next level

Table 2.2.1.6.1. Facility level malaria data verification indicators by background characteristics, Ethiopia, 2018

Background characteristics	Facility provide malaria diagnosis and treatment	Malaria reporting system HMIS	All source docs & reports are available	Malaria reporting completeness	Matched	VF
Managing authority						
Government/Public	96	95	77	89	60	0.88280
NGO/not-for profit	95	100	70	91	100	1.00000
Private-for profit	53	86	56	61	84	0.99660
Mission/Faith based	100	94	32	94	78	0.99007
Facility type						
Referral hospital	93	100	93	100	67	0.91925
General hospital	97	97	85	94	69	0.90961
Primary hospital	98	98	86	95	49	0.93195
Health centre	97	95	77	88	61	0.95836
Private clinics	52	86	55	61	84	0.99589
Region						
Tigray	97	100	82	85	82	1.00102
Afar	95	95	60	75	62	0.98294
Amhara	62	100	58	76	42	0.82803
Oromia	80	85	76	83	76	0.54823
Somali	93	91	44	58	69	0.79538
Benishangul Gumuz	89	98	61	82	58	0.99824
S.N.N.P	73	93	81	86	53	1.03718
Gambella	100	100	37	48	84	0.97667
Harari	94	94	79	87	66	0.82090
Addis Ababa	83	90	77	88	82	0.48324
Dire Dawa	95	89	87	92	100	1.00000
Total	76	93	71	81	66	0.8972386

Table 2.2.1.6.2 shows facility level malaria verification factor categories by background characteristics.

- Seventy one percent of facilities had malaria reports that were within the acceptable range of matched +/- ten percent.
- All NGO/not-for profit facilities and 84 percent of facilities from private-for profit had data matching with source document.
- Government facilities had the lowest proportion (60 percent) of facilities that had data matching with source document.
- Seventeen percent and 12 percent of malaria reports showed greater than ten percent over and under reporting respectively.
- Twenty one and 13 percent of government facilities made greater than ten percent over and under reporting respectively.
- Twenty one percent of health centres and primary hospitals had greater than ten percent over reporting followed by referral hospitals (17 percent).
- Except private clinics, more than ten percent of all other facility type had greater than ten percent under reporting.

- Facilities in Dire Dawa (none), Gambella (3 percent), and Tigray (6 percent) were less likely to over report greater than ten percent.
- Facilities in Harari (12 percent), SNNP (26 percent) and Amhara (27 percent) regions were more likely to under report greater than ten percent.

Table 2.2.1.6.2. Facility level malaria verification factor categories by background characteristics, Ethiopia, 2018

Background characteristics	Verification category				
	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government/Public	21	5	60	1	13
NGO/not-for profit	0	0	100	0	0
Private-for profit	6	0	84	0	11
Mission/Faith based	7	7	78	7	0
Facility type					
Referral hospital	17	0	67	4	13
General hospital	12	4	69	2	12
Primary hospital	21	5	49	10	14
Health centre	21	5	61	0	12
Private clinics	6	0	84	0	10
Region					
Tigray	6	5	82	1	6
Afar	22	7	62	2	7
Amhara	16	14	42	1	27
Oromia	22	0	76	0	1
Somali	15	15	69	0	2
Benishangul Gumuz	14	14	58	7	7
S.N.N.P	20	1	53	1	26
Gambella	3	7	84	7	0
Harari	22	0	66	0	12
Addis Ababa	12	1	82	0	5
Dire Dawa	0	0	100	0	0
Total	17	4	66	1	12

2.2.1.7. Family planning (FP)

Table 2.2.1.7.1 summarizes facility level FP data verification indicators by background characteristics.

- Nationally92 percent of facilities offered FP services.
- Ninety three percent of facilities that offered FP service reported to Government HMIS system.
- Sixty four percent of facilities had source documents and reports available for FP.
- All mission/faith based and 95 percent of NGO/not for profit facilities had all source documents and reports for FP. Only 56 percent of private for profit facilities had all source documents and reports for FP.
- More than seven in ten referral general and primary hospitals had all source documents and reports for FP services.

- Of the regions Gambella had the smallest proportion (37percent) of facilities with source documents and reports available for FP. The rest of the regions had more than half of facilities with source documents and reports available for FP.
- The completeness of FP data among facilities that provide FP service and reported through HMISwas85 percent.
- All NGO/not for profit and mission/faith based facilities, and about nine out of ten government facilities had complete FP data.
- Compared with facilities under other managing authority, private for profit facilities had the smallest proportion of facilities (75 percent) with complete FP data.
- Except Somali (57 percent), and Gambella (65 percent), all the other regionshad79 percent and above of their facilities with complete FP data.
- At national level 55percent of the facilities had FP report that matched with source document.
- Seventy eight percent of facilities managed by NGO/not-for profit and 62 percent of private-for profit facilities had FP report that matched with the source document.
- Government facilities had the lowest proportion of facilities (52 percent) with FP report that matched with source document.
- Of all facility types, hospitals had a smaller proportion (<50 percent) of facilities with FP report matched with source document.
- Among the regions, except Tigray (66 percent) and Somali (69 percent) and Oromia (81 percent) all the other regions had fewer than 55 percent of their facilities with FP report that matched with source document.
- The overall VF for the FP data was 0.80007 indicating over reporting of FP data to the next level

Table 2.2.1.7.1. Facility level FP data verification factors indicators by background characteristics, Ethiopia, 2018

Background characteristics	facilities provided FP services	FP reporting system HMIS	All source docs & reports are available	FP reporting completeness	Matched	VF
Managing authority						
Government/Public	99	97	69	91	52	0.75254
NGO/not-for profit	55	100	95	100	78	0.91070
Private-for profit	85	84	56	75	62	0.98132
Mission/Faith based	12	100	100	100	60	0.90997
Facility type						
Referral hospital	97	100	71	99	45	0.92299
General hospital	94	99	81	97	46	0.92921
Primary hospital	96	99	81	94	38	0.84018
Health centre	99	97	68	91	53	0.74355
Private clinics	82	84	55	75	62	0.97920
Region						
Tigray	96	100	84	89	66	0.97393
Afar	93	100	78	79	53	0.75201
Amhara	96	92	56	83	36	0.84736
Oromia	97	92	57	86	81	0.89741
Somali	91	93	51	57	69	0.57160
Benishangul Gumuz	100	100	51	88	40	0.87407
S.N.N.P	90	87	80	91	45	0.48926
Gambella	95	100	37	65	44	0.71538

Harari	59	100	86	90	33	0.92014
Addis Ababa	66	100	77	85	52	0.67554
Dire Dawa	68	100	78	93	53	0.92595
Total	92	93	64	85	55	0.80007

Table 2.2.1.7.2 shows facility level FP verification factor categories by background characteristics,

- Seventy four percent of facilities had FP reports that were within the acceptable range of matched +/- ten percent.
- Over and under reporting greater than ten percent was observed in 24 and two percent of facilities respectively.
- Thirty two percent of government and 20 percent of mission based facilities made greater than ten percent over reporting.
- Except private clinics (7 percent), all other facilities had a quarter and above over reporting greater than ten percent.
- Of the regions except Harari (5 percent) all regions had 15 to 41 percent over reporting greater than ten percent.

Table 2.2.1.7.2. Facility level FP verification factor categories by background characteristics, Ethiopia, 2018

Background characteristics	Verification category				
	>10% over reporting	Up to 10 % over reporting	Matched	Up to 10 % under reporting	>10% under reporting
Managing authority					
Government/Public	32	7	52	6	2
NGO/not-for profit	11	0	78	0	11
Private-for profit	7	22	62	8	1
Mission/Faith based	20	20	60	0	0
Facility type					
Referral hospital	25	0	45	20	10
General hospital	25	9	46	9	10
Primary hospital	26	18	38	11	7
Health centre	33	7	53	5	2
Private clinics	7	23	62	8	0
Region	0	0	0	0	0
Tigray	15	5	66	14	1
Afar	41	4	53	3	0
Amhara	26	25	36	13	0
Oromia	18	1	81	0	0
Somali	29	1	69	1	0
Benishangul Gumuz	37	15	40	7	0
S.N.N.P	29	14	45	6	6
Gambella	22	0	44	29	4
Harari	5	27	33	25	10
Addis Ababa	33	12	52	1	1
Dire Dawa	28	5	53	0	14
Total	24	12	55	7	2

2.2.2. District/Woreda DV

The quality of data depends on the accuracy and consistency of data throughout the different levels of health system management. Each level has to report exact figure of reported data to the next level to ensure quality and better utilization for action.

The District/Woreda, Zone and Regional level verification was done using reports and source document on selected seven indicators (ANC1, delivery, penta3, PMTCT, TB, malaria, and family planning acceptors). The findings were presented in accordance with the verification factor (ratio) for the above mentioned indicators at the different health management level.

2.2.2.1. Antenatal Care (ANC)

Table 2.2.2.1 shows results of district/Woreda antenatal care first visit data verification.

- The overall verification factor for district/Woreda ANC1 was0.9939343.
- District/Woreda level source document data for ANC1 matched with the ANC reported data to a higher level in 68percent of Woredas.
- Six percent of the Woredas had greater than ten percent over reporting ANC1 data. While four percent had greater than ten percent under reporting.
- Woredas in Somali region (22 percent) were more likely to over report greater than ten percent.

Table 2.2.2.1.District/Woreda level ANC data verification by region, DQR, Ethiopia 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	0	10	88	0	2	1.027542	41
Afar	11	11	53	21	5	0.959301	19
Amhara	4	18	67	5	5	1.002617	73
Oromia	6	10	67	13	4	0.992247	90
Somali	22	0	63	11	4	0.919971	29
Benishangul Gumuz	6	24	59	12	0	0.981266	17
S.N.N.P.	4	14	69	10	3	1.001518	72
Gambella	0	33	50	17	0	0.98987	6
Harari	13	38	25	25	0	0.925453	8
Dire Dawa	0	10	90	0	0	0.99891	10
Total	6	13	68	10	4	0.993934	365

2.2.2.2. Delivery

Table 2.2.2.2 shows results of district/Woreda delivery data verification.

- The overall verification factor for district/Woreda delivery data was0.9958877.
- District/Woreda level source document data for delivery matched with the Delivery reported data to a higher level in 79 percent of Woredas.
- Five percent of the Woredas had greater than ten percent over reporting of data for delivery. While three percent had greater than ten percent under reporting.
- Larger proportion of greater than ten percent over reporting of delivery data was seen in Somali (19 percent), Benishangul Gumuz (18 percent), and Gambella (17 percent) region Woredas.
- Woredas in Afar (32 percent) region were more likely to over report greater than ten percent.

Table 2.2.2.2. District/Woreda level delivery data verification by region, 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	0	5	88	7	0	0.9951	41
Afar	5	16	47	0	32	1.155049	19
Amhara	4	5	77	12	1	0.997893	73
Oromia	2	7	87	4	0	0.994134	89
Somali	19	4	74	0	4	0.986077	29
Benishangul Gumuz	18	0	76	0	6	0.976587	17
S.N.N.P.	3	12	77	4	4	0.994996	73
Gambella	17	0	83	0	0	0.935374	6
Harari	14	14	57	14	0	0.973262	7
Dire Dawa	10	0	90	0	0	0.982033	10
Total	5	7	79	6	3	0.995888	364

2.2.2.3. DPT-HepB-Hib3 (Penta 3)

Table 2.2.2.3 shows results of district/Woreda Penta3data verification.

- The overall verification factor for district/Woreda EPI (Penta3) was 0.9588439.
- District/Woreda level source document data for Penta3match with the Penta3reported data to a higher level in 69 percent of Woredas.
- Eight percent of the Woredas had greater than ten percent over reporting of data for Penta3, while three percent had greater than ten percent under reporting.
- Woredas in Gambella region (43 percent) followed by Somali (26 percent) were more likely to over report greater than ten percent.

Table 2.2.2.3. Woreda level Penta3 data verification by region, 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	3	13	83	3	0	0.990544	40
Afar	5	16	63	11	5	0.996169	19
Amhara	8	16	64	5	5	0.980693	73
Oromia	7	13	64	13	2	0.916718	89
Somali	26	7	63	4	0	0.848466	29
Benishangul Gumuz	6	12	71	12	0	0.981019	17
S.N.N.P.	4	8	79	4	4	1.030608	73
Gambella	43	0	57	0	0	0.926339	7
Harari	5	25	38	13	0	0.949489	8
Dire Dawa	0	0	90	10	0	1.007343	10
Total	8	12	69	7	3	0.958844	365

2.2.2.4. PMTCT

Table 2.2.2.4 shows results of district/Woreda PMTCT data verification.

- The overall verification factor for district/Woreda PMTCT was 0.9656696.

- District/Woreda level source document data for PMTCT match with the PMTCT reported data to a higher level in 80percentof Woredas.
- Three percent of the Woredas had greater than ten percent over reporting of data for PMTCT. While eight percent had greater than ten percent under reporting.
- All Woredas in Benishangul Gumuz and Dire Dawa had source document data for PMTCT that matches with the PMTCT reported data to a higher level.
- PMTCT data over reporting to the higher level is magnified in Harari and Somali districts.

Table 2.2.2.4.District/Woreda level PMTCT data verification by region, 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	6	0	94	0	0	0.9989	36
Afar	21	7	64	7	0	0.8627	14
Amhara	8	7	72	10	3	0.9729	61
Oromia	4	4	80	6	7	1.0104	54
Somali	11	22	67	0	0	0.8497	11
Benishangul Gumuz	0	0	100	0	0	1	8
S.N.N.P.	9	5	86	0	0	0.8790	44
Gambella	0	0	80	20	0	1.0041	5
Harari	25	25	25	0	25	0.6374	4
Dire Dawa	0	0	100	0	0	1	5
Total	3	5	80	5	8	0.96567	242

2.2.2.5. Tuberculosis (TB)

Table 2.2.2.5shows results of district/Woreda TB data verification.

- The overall verification factor for Woreda/District TB was 0.9505855.
- District/Woreda level source document data for TB match with the TB reported data to a higher level in86 percent of Woredas.
- Four percent of the Woredas had greater than ten percent over reporting of data for TB. While three percent had greater than ten percent under reporting.
- All Woredas in Dire Dawa region had source document data for TB match with the TB reported data to a higher level. While over reporting of TB data to the higher level dominates districts of Gambella and Harari.

Table 2.2.2.5. District/Woreda level TB data verification by region, 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	0	5	90	3	3	1.0054	39
Afar	19	0	63	6	13	0.9706	16
Amhara	1	6	89	0	4	1.0090	72
Oromia	5	5	88	2	1	0.9547	88
Somali	0	0	88	0	13	1.0976	18
BenishangulGumuz	0	7	93	0	0	0.9859	14
S.N.N.P.	6	4	84	4	1	0.8197	69
Gambella	33	0	67	0	0	0.8636	3

Harari	25	0	75	0	0	0.51	4
Dire Dawa	0	0	100	0	0	1	10
Total	4	4	86	2	3	0.9505855	333

2.2.2.6. Malaria

Table 2.2.2.6 shows results of district/Woreda malaria data verification.

- The overall verification factor for district/Woreda Malaria was 0.9877788.
- District/Woreda level source document data for malaria match with the Malaria reported data to a higher level in 64 percent of Woredas.
- Nine percent of the Woredas had greater than ten percent over reporting of data for Malaria. While eight percent had greater than ten percent under reporting.
- All districts in Dire Dawa had source document data for malaria that match with the reported data to a higher level.

Table 2.2.2.6. District/Woreda level malaria data verification by region, 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	2	17	71	7	2	0.9754	39
Afar	21	16	58	0	5	0.9426	16
Amhara	7	14	59	10	9	1.0037	72
Oromia	12	10	61	5	12	0.9811	88
Somali	13	0	74	4	9	0.9195	18
Benishangul Gumuz	6	18	65	12	0	0.9939	14
S.N.N.P.	6	10	62	12	10	0.9604	69
Gambella	0	17	67	0	17	1.3790	3
Harari	29	0	57	0	14	1.0832	4
Dire Dawa	0	0	100	0	0	1	10
Total	9	12	64	8	8	0.9877788	333

2.2.2.7. Family Planning (FP)

Table 2.2.2.7 shows results of district/Woreda FP data verification.

- The overall verification factor for district/Woreda FP was 0.9905328.
- Sixty seven percent of district/Woreda level FP reported data to a higher level matches with source document data.
- Nine percent of the Woredas had greater than ten percent over reporting of data for FP. While five percent had greater than ten percent under reporting.
- Harari and Somali (33 and 24 percent, respectively) had higher percentage of woreda that over reported TB data to the next higher level by more than 10percent

Table 2.2.2.7.District/Woreda level FP data verification by region, 2018

Region	Verification category						
	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	VF	Number of districts
Tigray	0	7	85	2	5	1.0055	39
Afar	5	21	63	5	5	1.0023	16

Amhara	12	21	49	11	7	0.9692	72
Oromia	8	11	67	9	6	0.9806	88
Somali	24	12	64	0	0	0.9585	18
Benishangul Gumuz	6	6	76	12	0	0.9966	14
S.N.N.P.	3	8	77	5	7	1.0327	69
Gambella	14	0	57	14	14	1.0195	3
Harari	33	11	33	22	0	0.8890	4
Dire Dawa	10	10	80	0	0	0.9964	10
Total	9	12	67	7	5	0.9905328	333

2.2.3. Zonal DV

There were only five regional states and one administration council that had functional Zonal health structure. A total of 61 zones were surveyed.

2.2.3.1. ANC

Table 2.2.3.1 shows results of Zonal ANC 1 first visit data verification.

- The overall verification factor for Zonal ANC1 was0.9022.
- Zonal level source document data for ANC1 match with the ANC reported data to a higher level in 84 percent of zones.
- There was only three percent greater than ten percent over reporting of ANC 1 data to a higher level.
- All zones in Amhara region had source document data for ANC1 that match with the ANC reported data to a higher level.

Table 2.2.3.1.1.Zonal level ANC data verification by region, 2018

Region	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	Verification factor	Surveyed zones
Amhara	0	0	100	0	1	11
Oromia	0	9	91	0	0.9981722	23
Benishangul Gumuz	0	33	67	0	0.9955373	3
S.N.N.P.	7	20	73	0	0.6234449	15
Gambella	50	0	50	0	0.7544643	2
Addis Ababa	0	13	75	13	1.002042	8
Total	3	11	84	2	0.9022	62

2.2.3.2. Delivery

Table 2.2.3.2 shows results of Zonal delivery data verification.

- The overall verification factor for Zonal Delivery data was0.99939.
- Zonal level source document data for delivery match with the reported data to a higher level in 93 percent of zones.
- All zones in Addis Ababa, Gambella and Amhara had source document data for delivery that match with the reported data to a higher level.

Table 2.2.3.2. Zonal level Delivery data verification by region, 2018

Region	>10% over-reporting	Up to 10% over-reporting	Matched	Up to 10% under-reporting	Verification factor	Surveyed zones
Amhara	0	0	100	0	1.00000	11
Oromia	0	4	91	4	0.99991	23
Benishangul Gumuz	33	0	67	0	0.98739	3
S.N.N.P.	0	7	93	0	0.99769	15
Gambella	0	0	100	0	1.00000	1
Addis Ababa	0	0	100	0	1.00000	8
Total	2	3	93	2	0.99939	61

2.2.3.3. DPT-HepB-Hib3 (Penta 3)

Table 2.2.3.3 shows results of Zonal Penta3 data verification.

- The overall verification factor for Zonal Penta3 was1.00009.
- Zonal level source document data for Penta3 match with the Penta3reported data to a higher level in 95 percent of Zones.
- None of the Zones had EPI report that was greater than ten percent under and/or over reported.
- All zones in Addis Ababa, Gambella and Amhara had source document data for EPI (Penta3) that match with the reported data to a higher level.

Table 2.2.3.3. Zonal level Penta3 data verification by region, 2018

Region	Up to 10% over-report	Matched	Up to 10% under-reporting	Verification factor	Surveyed zones
Amhara	0	100	0	1.00000	11
Oromia	4	96	0	0.99981	23
Benishangul Gumuz	33	67	0	0.99743	3
S.N.N.P.	0	93	7	1.00123	15
Gambella	0	100	0	1.00000	1
Addis Ababa	0	100	0	1.00000	8
Total	3	95	2	1.00009	61

2.2.3.4. PMTCT

Table 2.2.3.4 shows results of Zonal PMTCT data verification.

- The overall verification factor for Zonal PMTCTwas0.99998.
- Zonal level source document data for PMTCT match with the PMTCT reported data to a higher level in 97 percent of Zones.

Table2.2.3.4. Zonal level PMTCT data verification by region, 2018

Region	>10% over-reporting	Matched	Up to 10% under-reporting	Verification factor	Surveyed zones
Amhara	0	100	0	1	11
Oromia	0	100	0	1	23
Benishangul Gumuz	0	100	0	1	2
S.N.N.P.	7	93	0	0.98	14

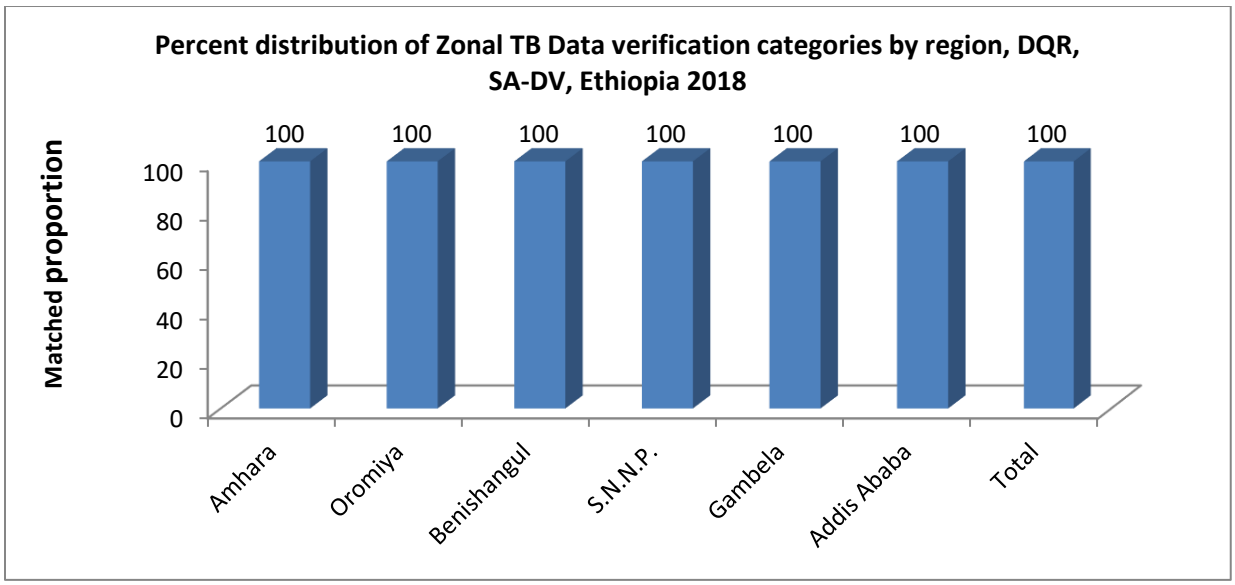
Gambella	0	100	0	1	1
Addis Ababa	0	88	13	1.00	8
Total	2	97	2	0.99998	59

2.2.3.5. Tuberculosis

Figure 2.2.3.5 shows results of Zonal TB data verification.

- All zones in all the regions had source document data for TB match with the TB reported data to a higher level.

Figure 2.2.3.5. Zonal level TB data verification by region, DQR, SA-DV 2018



2.2.3.6. Malaria

Table 2.2.3.6 shows results of Zonal Malaria data verification.

- The overall verification factor for Zonal Malariawas1.01319.
- Zonal level source document data for Malaria match with the Malaria reported data to a higher level in 92percentof Zones.
- All zones in Addis Ababa and Gambella had the source document data for Malaria match with the Malaria reported data to a higher level.
- Nationally, two percent of the Zones had greater than ten percent over reporting of data for Malaria. While three percent had greater than ten percent under reporting.

Table2.2.3.6. Zonal level Malaria data verification, region, Ethiopia 2018

Region	>10% over-reporting	Matched	Up to 10% under-reporting	>10% under-reporting	Verification factor	Surveyed zones
Amhara	0	82	18	0	1.000615	11
Oromia	0	96	0	4	1.03242	23
Benishangul	33	67	0	0	0.995604	3
S.N.N.P.	0	93	0	7	1.019274	15
Gambella	0	100	0	0	1	1

Addis Ababa	0	100	0	0	1	8
Total	2	92	3	3	1.01319	61

2.2.3.7. Family planning (FP)

Table 2.2.3.7 shows Zonal level family planning data verification category

- The overall Zonal verification factor was 1.001014.
- Ninety three percent of the zones had family planning data that matched the report.
- All zones in Gambella, Addis Ababa and Amhara have family planning data that matched the report.

Table2.2.3.7. Zonal level FP verification category region, Ethiopia 2018

Region	up to 10% over-reporting	Matched	Up to 10% under-reporting	Verification factor	Surveyed zones
Amhara	0	100	0	1	11
Oromia	4	91	4	1.001634	23
Benishangul	33	67	0	0.9961338	3
S.N.N.P.	0	93	7	1.000477	15
Gambella	0	100	0	1	1
Addis Ababa	0	100	0	0.9988232	8
Total	3	93	3	1.001014	61

2.2.4. Regional DV

2.2.4.1. ANC

Table 2.2.4.1 shows regional level ANC data verification category.

- The overall regional level data verification factor was 0.999934.
- Eighty two percent of regions had ANC report that exactly matched with the source document.
- All regions except Gambella and Harari had report that exactly matched with the source document.

Table 2.2.4.1. Regional level ANC data verification category, Ethiopia 2018

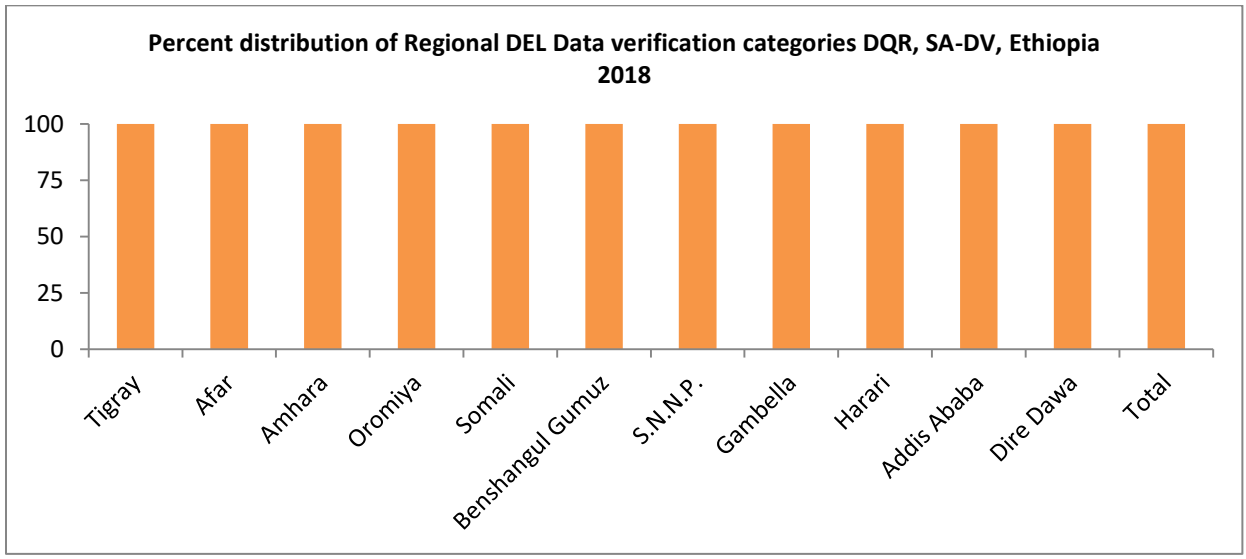
Region	Up to 10% over reporting	Matched	Up to 10% under reporting	Verification factor
Tigray	0	100	0	1
Afar	0	100	0	0.999607
Amhara	0	100	0	1
Oromia	0	100	0	1
Somali	0	100	0	1
Benishangul Gumuz	0	100	0	1
S.N.N.P.	0	100	0	1
Gambella	100	0	0	0.925015
Harari	0	0	100	1.023571
Addis Ababa	0	100	0	1
Dire Dawa	0	100	0	1
Total	9	82	9	0.999934

2.2.4.2. Delivery

Figure 2.2.4.2 shows regional level delivery data verification factor category

- All regions had delivery report that exactly matched with the source document.

Figure 2.2.4.2. Regional Level delivery Data Verification factor category, Ethiopia DV-SA 2018



2.2.4.3. DPT-HepB-Hib3 (Penta 3)

Table 2.2.4.3 shows regional level penta3 data verification factor category

- The overall regional level data verification factor for Penta3 was 0.999714.
- Ninety one percent of regions hadPenta3 report that exactly matched with the source document.
- All regions except GambellahadPenta3report that exactly matched with the source document.

Table 2.2.4.3. Regional Level penta3 Data Verification factor category, Ethiopia 2018

Region	> 10% over reporting	Matched	Verification factor
Tigray	0	100	1
Afar	0	100	1
Amhara	0	100	1
Oromia	0	100	1
Somali	0	100	1
Benishangul Gumuz	0	100	1
S.N.N.P.	0	100	1
Gambella	100	0	0.890656
Harari	0	100	1.008691
Addis Ababa	0	100	1
Dire Dawa	0	100	1
Total	9	91	0.999714

2.2.4.4. PMTCT

Table 2.2.4.4 shows regional Level PMTCT Data Verification factor category.

- The overall regional level data verification factor for PMTCT was 1.003408.
- Eighty two percent of regions had a PMTCT report that exactly matched with the source document.
- Except Gambella and Harari all regions and city administration councils had report that exactly matched with the source document.
- Gambella and Harari had verification factor that was greater than one, indicating that the two regions under reported PMTCT data to the next higher reporting level.

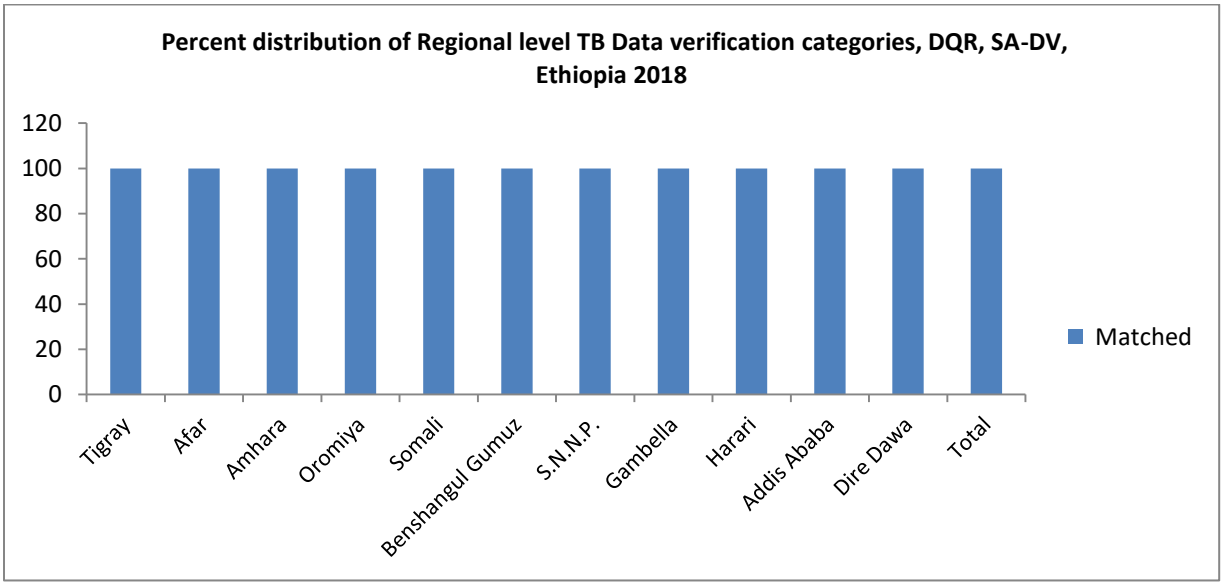
Table 2.2.4.4. Regional Level PMTCT Data Verification factor category, Ethiopia 2018

Region	Matched	Up to 10% under reporting	>10% under reporting	Verification factor
Tigray	100	0	0	1
Afar	100	0	0	1
Amhara	100	0	0	1
Oromia	100	0	0	1
Somali	100	0	0	1
Benishangul Gumuz	100	0	0	1
S.N.N.P.	100	0	0	1
Gambella	0	100	0	1.0625
Harari	0	0	100	1.176471
Addis Ababa	100	0	0	1
Dire Dawa	100	0	0	1
Total	82	9	9	1.003408

2.2.4.5. Tuberculosis (TB)

TB reports match source documents in all the regions and city administration councils.

Figure2.24.5. Figure showing regional level TB Data verification categories, Ethiopia SA-DV 2018



2.2.4.6. Malaria

Table 2.2.4.6 shows regional Level Malaria Data Verification factor category

- The overall regional level data verification factor for malaria was 0.9907257.
- Ninety one percent of regions had a Malaria report that exactly matched with the source document.

- All regions except Gambella had report that exactly matched with the source document.
- Harari region had Verification factor that was greater than one.

Table 2.2.4.6. Regional Level Malaria Data Verification factor category, Ethiopia 2018

Region	> 10% over reporting	Matched	Verification factor
Tigray	0	100	1
Afar	0	100	1
Amhara	0	100	1
Oromia	0	100	1
Somali	0	100	1
Benishangul Gumuz	0	100	1
S.N.N.P.	0	100	0.994296
Gambella	100	0	0.886995
Harari	0	100	1.001105
Addis Ababa	0	100	1
Dire Dawa	0	100	1
Total	9	91	0.990726

2.2.4.7. Family planning (FP)

Table 2.2.4.7 shows regional level family planning data verification category.

- The overall regional FP verification factor is 1.000182.
- Ninety one percent of the regions had FP report that matched source documents.
- Harari region had a verification factor greater than one. No region had FP report that was greater than ten percent under and over reported.

Table2.2.4.7. Regional level family planning data verification category, Ethiopia 2018

Region	Matched	Up to 10% under reporting	VF
Tigray	100	0	1
Afar	100	0	1
Amhara	100	0	1
Oromia	100	0	1
Somali	100	0	1
Benishangul Gumuz	100	0	1
S.N.N.P.	100	0	1
Gambella	100	0	1
Harari	0	100	1.039817
Addis Ababa	100	0	1
Dire Dawa	100	0	1
Total	91	9	1.000182

2.2.5. Comparison of data verification findings across the different health units

Table 2.2.5 shows summary of facility, Woreda, Zonal and Regional level data verification factor category by indicators.

- The pattern shows in almost all indicators that the higher the authority level the higher the proportion of reports that exactly matches the source document.

Table 2.2.5 Summary of facility, Woreda, Zonal and Regional level data verification factors category by indicators

DV Indicators	Level	proportion of verification category			Verification Factor
		greater than ten percent over reporting	Matched + up to ten percent under and over reporting	greater than ten percent under reporting	
ANC	Facility	19	78	3	0.9293065
	Woreda	6	91	4	0.964
	Zone	3	97	0	0.9022
	Region	0	100	0	0.99
Delivery	Facility	11	88	1	1.008
	Woreda	5	91	3	0.966
	Zone	2	98	2	0.9993993
	Region	0	100	0	1
Penta3	Facility	14	74	12	0.958
	Woreda	8	89	3	0.951
	Zone	0	100	0	1.000093
	Region	9	91	0	0.999714
PMTCT	Facility	16	77	7	0.948
	Woreda	3	90	8	0.974
	Zone	2	98	0	0.99998
	Region	0	91	9	1.003408
Tuberculosis	Facility	12	85	4	0.8991061
	Woreda	4	93	3	0.964
	Zone	0	100	0	1
	Region	0	100	0	1
Malaria	Facility	17	71	12	0.8972386
	Woreda	9	83	8	0.92
	Zone	2	95	3	1.01319
	Region	9	91	0	0.990726

3. Conclusion

The whole purpose of conducting a DQR survey was improvement in data quality and management. The results of the DQA survey will be used to prepare a strategy to build on the good performance and improve on areas that are under performing. As was obvious in the results, almost all under performance was at the facility level. As facility level was the crucial entry point to all health related data, all subsequent health administration units put great effort to strengthen facility HMIS.

The gap in trained staff on data collection and compilation could result in under performance in all the other data quality aspects. The fact that facilities had less proportion with trained staff can explain the underperformance. On the other hand the presence of trained staff at all regions can contribute for better data quality.

At facility level findings for some indicators had better data quality than others, showing emphasis given to the program. This can be used to improve data quality in the other programs.

- At national level, for ANC1, Delivery, PMTCT, TB, Malaria, FP services the verification factors (< 1) indicated as there were over reporting, while it was revealed an underreporting (>1) only for Penta3
- All facilities managed by NGO/not-for profit and mission/faith based; referral hospitals, facilities in Tigray, Afar, Benishangul Gumuz, S.N.N.P, Gambella, Harari and Addis Ababa report their ANC1 service data to government HMIS system
- All referral hospitals, facilities in Harari and Dire Dawa reported complete ANC1 data.
- All facilities managed by NGO/not-for profit and mission/faith based, referral hospitals, private clinics, and all facilities except in Oromiya, Somali and S.N.N.P reported their Delivery service data to government HMIS system
- All facilities under NGO/not-for profit, facilities in Tigray, Benishangyl Gumuz and S.N.N.P reported complete delivery data.
- All facilities managed by NGO/not-for profit and private for profit, mission/faith-based, hospitals, private clinics, facilities in all regions except Oromiya reported their Penta3 service data to government HMIS system
- All facilities managed by NGO/not-for profit, referral hospitals, private clinics, and facilities in Amhara, S.N.N.P and Harari reported complete Penta3 data.
- All facilities managed by NGO/not-for profit and mission/faith-based; referral hospitals, private clinics, all facilities except in Oromiya and Somali reported their PMTCT service data to government HMIS system
- All referral hospitals and facilities in Benishangul Gumuz reported complete PMTCT data
- All facilities managed by NGO/not-for profit and mission/faith-based, referral and primary hospitals; and all facilities except in Oromiya, S.N.N.P and Gambella reported their TB service data to government HMIS system
- All facilities under NGO/not-for profit , referral hospitals; and facilities in Amhara and S.N.N.P reported complete TB data
- All facilities managed by NGO/not-for profit, referral hospitals and facilities in Tigray, Amhara and Gambella reported their Malaria service data to government HMIS system
- All referral hospitals reported complete Malaria data.
- All facilities managed by NGO/not-for profit and mission/faith-based, referral hospital; and all facilities in Tigray, Afar, Benishangul Gumuz, Gambella, Harari, Addis Ababa and Dire Dawa reported their Family planning service data to government HMIS system
- All facilities under NGO/not-for profit and mission/faith based reported complete Family planning data

At Zonal level, malaria and Penta3 data were under reported, while PMTCT, delivery and ANC1 data were over reported from zones to the next higher reporting level. TB program has good data quality in all assessed zones. Hence, other programs should learn from TB data processing and reporting mechanism.

At regional level, TB and delivery data at all regions were exactly matched with the source documents. Hence, all regions should take lesson from TB and delivery report systems to avoid discrepancies for other indicators.

Gambella region had up to 10% over reporting both malaria and ANC1 and greater than 10% over Penta3 data for the next level. Hence, it should improve its data management system. Harari region and Addis Ababa should improve report of PMTCT data to the next level.

4. Recommendations

Based on the current findings, we recommend the following.

- Dissemination of survey result by health administrative unit.
- Further qualitative study of crucial underperforming areas.
- Facilitating use of survey findings by health managers for program improvement.
- Zones should assess areas of reporting problems to improve their data management system.
- Regions, for example Gambella, with inaccuracy of reporting data to higher level have to get training on data processing.
- For the following listed indicators, FMOH should give more attention to improve the proportion of facilities report which were below 50% completed data:-
    - For ANC1 data, facilities managed by private-for-profit (34%) and private clinics (33%)
    - For delivery data, private clinics (45%)
    - For TB data, facilities under mission/faith based (32%)
    - For Malaria data, facilities from Gambella (48%)

5. References:

Improving Data Quality, a guide for developing countries, WHO.

Guide to the health facility data quality report card, WHO.

Data quality assessment in the routine health information system: an application of the Lot Quality Assurance Sampling in Benin, London school of hygiene and tropical medicine, Health Policy and Planning 2015;30:837–843 doi:10.1093/heapol/czu067:

An assessment of the accuracy and availability of data in electronic patient tracking systems for patients receiving HIV treatment in central Mozambique Lambd in et al. BMC Health Services Research 2012, 12:30)

SURVEY PERSONNEL *Appendix A*

NATIONAL LEVEL COORDINATORS

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50. Leta Bayisa
51. Mary Ayele Ashako
52. Matewos Kumera
53. Melese Tilahun
54. Melkamu Dagnew
55. Merkeb Zeray G/Tatins
56. Meron Kibebe
57. Moibon Silku
58. Natnael Chekol
59. Netsanet Meles
60. Nimona Ejerso
61. Rabira Tariku
62. Rahel Molla
63. Sabita Alewi
64. Samuel Argae
65. Senbato Tamiru
66. Selamawit Assefa
67. Sena Gelacha Ayana
68. Shegaw Ayalew Yeneneh
69. Solomon Tsegaye
70. Sora Asfaw
71. Suleyman Mohammed
72. Tadesse Fufa
73. Tamirat Tekassa
74. Tesfaye Mershu
75. Teshome Kefeley
76. Teshome Mezegbu Abeje
77. Teshome Worke
78. Tigist Tekle
79. Wasihun Zewedu
80. Wondante Getenet
81. Worku Adane
82. Yitagesu Zeleke
83. Yohannis Hailu
84. Yordanos Alem Hagos
85. Zehara Muzyn
86. Zerihun W/Senbet
87. Habtamu Oljira
88. Henok Mulugeta Derebe
89. Yared Bacha

Data Quality Review

2018

FINAL
REPORT

Ethiopian Public Health Institute
(EPHI)