Routine Data Quality Assessment Report for the

Isiolo and Marsabit County Health System

Nawiri

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ACRONYMS

ANC	Ante-Natal Clinic
BHA	Bureau of Humanitarian Assistance
CIDP	County Integrated Development Plan
CRS	Catholic Relief Services
CWW	Concern Worldwide
DHIS	District Health Information System
DQA	Data Quality Assessment
H/C	Health Centre
HF	Health Facility
HIS	Health Information System
IBTCI	International Business & Technical Consultants, Inc.
KHIS	Kenya Health Information System
LQAS	Lot Quality Assurance Sampling
MAM	Moderate Acute Malnutrition
MOH	Ministry of Health
M&E	Monitoring and Evaluation
Nawiri	Nutrition Achievements within Resilient Institution
ORS	Oral Rehydration Salt
RDQA	Routine Data Quality Assessment
SAM	Severe Acute Malnutrition
USAID	United States Agency for International Development

Executive Summary

The country's health sector performance can only be adequately monitored if the data used for decision-making is reliable and high quality. With devolution, national and county governments are obligated by law to provide periodic reports and evaluate their performance regarding targets for agreed-upon health outcomes and recommend appropriate actions as stipulated in the various governing acts. The Nawiri project supported the implementation of a routine data quality assessment (RDQA) which was conducted in 2021 in the two counties of Isiolo and Marsabit, where the project is operational. The assessment was performed using a descriptive cross-sectional design to collect data from 31 health facilities. The data collection was conducted by Ministry of Health (MoH) officials from both counties supported by the Nawiri monitoring and evaluation (M&E) team and analyzed by International Business and Technical Consultants Inc. (IBTCI). The assessment utilized qualitative and quantitative methods to verify the data from source documents for selected indicators against summary data and Kenya Health Information System (KHIS) data collected during the months of July 2021 to September 2021. Seven indicators were selected for this assessment, taking into account key programmatic areas in the health sector.

The assessment concluded that most of the data tools were available at the facilities visited but were not always completed. There were also cases of missing source document summary sheets in the health facility. The **availability of documents** ranged from 95% accuracy for the indicator *"Number of women who took iron tablets or syrup during most recent pregnancy"* to 36% accuracy for the indicator *"Number of children under [age] 5 who were admitted for treatment of Moderate Acute Malnutrition (MAM)."* However, the type of documents available for review by the RDQA team ranged from standard registers to improvised counter books, to older versions of the registers.

The following table reflects the ***percentage of accuracy*** for different types of comparisons held for each one of the indicators studied.

Table 1: Percentage of accuracy when comparing phases of data transmission per indicator selected

Indicator	Accuracy between source documents & Summary sheets	Accuracy between source documents & KHIS	Accuracy between summary sheets & KHIS
# Of women who took iron tablets or syrup during most recent pregnancy	10	37	55
# Of children aged 6-59 months who were given vitamin A supplements	10	33	19
# Of children < 5 who were admitted for treatment of moderate acute malnutrition (MAM)	10	73	32
# Of children < 5 who received treatment for severe acute malnutrition (SAM)	10	6	39
# Of children <5 who received ORS ZINC supplementation during episodes of diarrhea	35	32	45
# Of pregnant women attending 1st ANC visit	16	23	65
# Of pregnant women attending 4th ANC visit	10	32	65

On the qualitative aspect of the RDQA, the factors affecting data quality were lack of training and supportive supervision of staff handling data; non-medical staff handling data (casuals); lack of data review measures; and complex aggregation procedures. In addition, some staff weighing MAM and SAM lacked the technical capacity to measure the data. Other factors included chronic lack of tools resulting in improvisation; lack of instructions, especially on summary tools; some facilities not utilizing standard tools and using those of partners; and no written guidelines available on data collection, aggregation and manipulation procedures.

The conclusion drawn from this RDQA were that the accuracy of summary data and DHIS data against the source documents was generally low. This was aggravated by several systemic issues including: lack of standardized tools, accountability and standard operating procedures; lack of indicator definitions; and unclear roles and responsibilities. Among the emerging recommendations were sensitization and collaborative efforts by all stakeholders in investing in good data quality; development of data quality improvement plans to strategize on addressing the myriad systemic issues affecting data quality; dissemination of data quality assurance protocols; investment in technology to ease data workload; and targeted efforts toward data use, including data reviews and performance review forums as well as regular data product generation and dissemination. Emerging recommendations were mainly as follows: Sensitize stakeholders and staff about the importance of data quality in activities led by the MOH; Develop data quality improvement plans including measures to address the myriad of systemic issues affecting data quality; Disseminate the data quality assurance protocol; Invest in technology to collect, aggregate and transmit data to reduce errors and ease work load; Hold data reviews and performance review forums and regularise the generation and dissemination of data-related products.

1.0 Introduction

Establishing a robust health information system that is able to monitor the performance of health programs and track progressive improvements is one of the flagship projects of Kenya Vision 2030. [Constitution of Kenya 2010](#) [Constitution of Kenya 2010](#), The Constitution of Kenya 2010 states that every person has a right to the highest attainable standard of health, including the right to health care services; hence, there is a need for transparency, accountability and public participation. These investments and inputs in health, accompanied by the effective and efficient management of resources, should translate to better and demonstrable health outcomes. In this regard, the quality of all health data and health-related data needs to be beyond reproach in order to cast an authentic picture of progress and inform a sound evidence-based decision-making process. This is of interest to county and national governments, which are obligated by law to provide periodic reports and evaluate the performance of the national and county governments with regard to health outcomes and recommend appropriate actions as stipulated in the County Government Act (2012) and Intergovernmental Relations Act (2012).

Establishing a robust health information system that can support performance monitoring of health programs, and track progressive improvement of Kenyan citizens' health, is one of Kenya Vision 2030's flagship projects. As stated in the [Constitution of Kenya 2010](#), art. 43 sec. 1.a: "*Every person has the right to the highest attainable standard of health, which includes the right to health care services, including reproductive healthcare*." Hence the need for transparency, accountability, and public participation in monitoring health sector performance. The investments in the health system, accompanied by effective and efficient management of resources, should translate into better and demonstrable health outcomes. The quality of all health data needs to be beyond reproach to cast an authentic picture of progress and inform sound evidence-based decision-making processes. This is of interest to county and national governments which are obligated by law to give periodic reports, evaluating the governments' performance with regard to health outcomes, and recommending appropriate actions as stipulated in the [County Government Act (2012)](#) and [Intergovernmental Relations Act (2012).](#)

1.1 Kenya Health Information System

Collection, analysis, dissemination, and use of information is key meeting the health Policy objectives, and reaching the overarching goal of "Better Health, in a responsive manner." A well-functioning health information system (HIS) is critical for evidence-based decision-making and for monitoring interventions geared toward attaining better health outcomes. Quality data is needed to inform the design of interventions and to monitor and evaluate plans and quantify progress toward predetermined treatment, prevention and care targets. Attention to data quality ensures that target setting, and results reporting are informed by valid and sensitive information, and that reporting service providers are collecting and organizing this information in a consistent manner. In keeping with quality standards, data should be reliable, accurate, precise, and complete, provided in a timely manner, and maintains client confidentiality.

1.2 Objectives

The objectives of conducting the data quality assessment were to:
- Verify the quality of the data pertaining to key indicators at selected sites/levels
- Assess the ability of data management systems to collect, manage and report quality service utilization data
- Identify corrective measures, develop action plans for strengthening the data management and reporting system, and improve data quality

2.0 Methodology

2.1 Assessment Design

A descriptive cross-sectional design was adopted for this assessment targeting the service utilization data collected between the months of July 2021 to September 2021. The survey utilized both qualitative and quantitative methods to verify the data from source documents (registers) for select indicators against summary data (reporting forms) and KHIS data (software). The assessment also collected qualitative data on the data management systems to determine their ability to collect, manage and report quality data. Using the Lot Quality Assurance Sampling (LQAS) approach, the team randomly selected 31 health facilities from across the two counties where Nawiri operates: Isiolo and Marsabit. In the study, 11 facilities came from Isiolo and 20 from Marsabit all focusing on the sub-counties targeted by the Nawiri IMAM Surge Pilot Study.

2.2 Indicator Selection and Registers Examined

In consultation with different programmatic service delivery areas of the MoH, seven indicators were selected. These indicators take into account the representation of programmatic areas and types of registers and summary tools used in collecting data to feed into the selected indicators. In some cases, this meant looking closely into the data collected by health facilities and linking it to the selected indicators. For example, a summary form might be used to collect data on the number of women who take vitamin A supplements. We looked at whether the form itself ensures that the data collected applies to pregnant women or not, as required by indicator #1 listed below.

The seven indicators and their corresponding registers and summary tools assessed included:

1. Number of women who took iron tablets or syrup during most recent pregnancy
2. Number of children ages 6 to 59 months who were given vitamin A supplements
3. Number of children under age 5 who were admitted for treatment of MAM
4. Number of children under age 5 who received treatment for SAM
5. Number of children under age 5 who received ORS zinc supplementation during an episode of diarrhea
6. Number of pregnant women attending first ANC visit, and
7. Number of pregnant women attending fourth ANC visit

The team reviewed the following registers corresponding to the indicators were assessed MOH 711, MOH 511, MOH 405, MOH 710, MOH 410A, MOH 713, MOH 409, MOH 204A.

2.3 Assessment Tools

The assessment tool was adapted from the global U.S. Agency for International Development (USAID) RDQA tool developed by MEASURE Evaluation. The tool comprises three main components: 1) data verification and data management, 2) systems assessment and 3) data quality dimensions at service site. The data verification section assessed the availability, completeness and accuracy of data for each of the audited indicators. The data management and systems assessment section include interview questions to assess the strength of the underlying factors that may affect data quality. The data quality dimensions assess the completeness, accuracy, and timeliness of the data in the database system. Generally, the quality of reported data is dependent on the underlying data management and reporting systems; stronger systems should produce better quality data.

2.4 Data Collection Tools

Field teams were trained on data collection techniques using the RDQA tool during a workshop held in Isiolo County from September 1, 2021, to September 4, 2021. The teams had practiced on the tools during the training period and pre-tested them in sampled health facilities in Isiolo. The data collection teams were deployed to the field to collect data in Isiolo and Marsabit counties. The period selected for review was July 1, 2021, to September 30, 2021. All sampled health facilities and sub-county health record offices were visited in October 2021.

Data collection was performed through document review for data verifications and key informant interviews with health providers for systems assessment. Ideally, routine health data is collected in standardized registers at each facility where health care services are delivered. Collation should be done daily, but the RDQA found that it is usually done monthly. Health staff from the different primary health care facilities collate the data and send monthly summaries on paper/via WhatsApp to the sub-county health records and information officer (HRIO). These summaries are then entered into the web-based District Health Information Software (DHIS2) system by the HRIO based within the sub-county health office. With this background in mind, the data verification was done by recounting data from the source documents for each indicator. In addition, the teams copied the figure in the summary tool for the corresponding month. The recounted and reported values were entered into corresponding cells of the excel RDQA questionnaire. As per the values entered, the recounted figure was compared to the reported values. Summary statistics of all indicators are also calculated and presented graphically in the dashboard of the tool for each site and aggregation level scores. In addition, the data reported in the KHIS for the period was obtained and compared with the recounted and summary data.

We conducted a systems assessment through qualitative questions administered to health workers within the facilities focusing on the facility's data management capacity. Information was collected on five areas of data management and reporting systems:

- Monitoring and evaluating capabilities, roles and responsibilities/training
- Indicator definitions and data reporting requirements
- Data collection tools and reporting forms
- Data management processes and data quality controls
- Links with national reporting system

2.5 Data Analysis

Data analysis for the different types of data collected was as follows:

- The Microsoft Excel data collection tool aggregates scores from the different health facilities to generate a score per facility. Since the tool used is a spreadsheet which is not digitized, the compilation of data was done manually. A summary of all the recounted data, summary data from the summary tools, and KHIS data for the relevant indicators was outlined on a single sheet. The M&E team compared data across different sources to calculate the accuracy proportion.

- The system assessment utilizes the summary scores obtained from scoring different aspects of the five key areas: 1) M&E Structure, Functions and Capabilities; 2) Indicator Definitions and Reporting Guidelines; 3) Data Collection and Reporting Forms and Tools; 4) Data Management Processes; and 5) Links with National Reporting Systems. Results were presented in a spider diagram.

- The comments and notes taken during the data collection exercise were analyzed thematically and used to substantiate the findings of the systems assessment and other qualitative findings.

- Additionally, the M&E team conducted sub-county analyses to shed light on completeness, availability, and timeliness of received reports.

2.6 Ethical Considerations

The M&E team briefed the data collection teams were briefed on the importance of confidentiality, since the information being reviewed referred to health records and patient information. Facility records were treated with utmost care and no records were carried away from the facilities. Where photographs were taken to illustrate the qualitative findings, care was taken not to expose patient information.

3.0 Findings

3.1 System Assessment-Facility Level (Overall Score)

Table 2 presents the scores per functional area for the 31 facilities visited during the DQA exercise. There are many health facilities with weak systems for one or two functional areas. These are functional areas where the score presented in the table is lower than 1.5. However, the overall average score for most health facilities falls between 1.5 and 2.5, meaning that some weaknesses were identified in their systems.

To identify the meaning of the scores obtained per functional area, we used the following color codes. Green means the presence of a strong system, yellow means the presence of functional areas with some weaknesses identified, and red means that the system is weak.

Color Code Key								
Green		2.5 - 3.0	Strong Systems	Yellow	1.5 - 2.5	Some weakness identified	Red	<1.5	Weak Systems

Table 2: Health Facilities Summary of Scores on Data Management and Reporting Systems Assessment

| Sub-county	Health facility	M&E Structure, Functions and Capabilities	Indicator Definitions and Reporting Guidelines	Data collection and Reporting Forms/Tools	Data Management Processes	Links with National Reporting System	Overall Average per facility
ISIOLO							
Garbatula	Modogashe Dispensary	1.25	3	3	1.5	2.25	2.2
Garbatula	Sericho Health Centre (H/C)	0.75	3	3	2	2.25	2.2
Garbatula	Badana Dispensary	1.25	3	2.7	1.5	2.25	2.14
Garbatula	Malkadaka Dispensary	1.5	3	3	1	2.25	2.15
Garbatula	Gafarsa H/C	1.75	2.75	2.9	2	2.25	2.33
Garbatula	Garbatulla Sub-County District Hospital	2	3	2.9	2.5	2.25	2.53
Garbatula	Duse Dispensary	1.25	2.75	3	2	3	2.4
Garbatula	Kinna H/C	1.75	3	2.9	1.5	2.25	2.28
Merti	Basa Dispensary	1.25	3	2.9	2	2.25	2.28
Merti	Mata-Arba Dispensary	1.75	2.25	2.8	2	2.25	2.21

Sub-county	Health facility	M&E Structure, Functions and Capabilities	Indicator Definitions and Reporting Guidelines	Data collection and Reporting Forms/Tools	Data Management Processes	Links with National Reporting System	Overall Average per facility
ISIOLO							
Merti	Biliqo Marara Dispensary	2	2.25	3	2	2.25	2.3
MARSABIT							
Laisamis	Korr H/C	2	3	2.9	2.5	2.25	2.53
Laisamis	Burriaramia	2	3	3	3.5	3	2.9
Laisamis	Ballah	2.25	3	3	3.5	3	2.95
Laisamis	Gatab	2.25	3	3	2.5	3	2.75
Laisamis	Loiyangalani	2.25	3	3	3	3	2.85
Laisamis	Kamboe Disp	1.5	3	2.8	3	2.25	2.51
Laisamis	Logologo H/C	2	3	2.8	2.5	3	2.66
Laisamis	Logologo AIC	2.5	3	3	3	3	2.9
Laisamis	Lontolio Disp	2	2.75	3	2	3	2.55
Laisamis	Ngurunit H/C	1.75	3	3	2	2.25	2.4
North-Horr	Bubisa	2.25	3	3	1.5	2.25	2.4
North-Horr	Maikona Health Centre	2.5	2.5	2.9	2.5	3	2.68
North-Horr	Boji Dispensary	1.25	2.75	2.7	1	1.5	1.84
North-Horr	Gus Dispensary	1.5	2.75	3	3.5	3	2.75
North-Horr	Malabot Dispensary	1.5	3	2.9	1.5	2.75	2.33
North-Horr	Kalacha Sub-County Hospital	2.5	3	2.9	1.5	1.75	2.33
North-Horr	Elgade Dispensary	1.75	3	2.9	3.5	1.75	2.58
North-Horr	Balesa Dispensary	1.75	1.25	0.9	3	1.75	1.73
North-Horr	El Hadi Dispensary	1.25	1.25	0.9	3	1.75	1.63
North-Horr	Dukana Health Centre	3	2	0.9	3	2.75	2.33

3.2 System Assessment-Functional Areas (Aggregated Average Scores)

Figure 1 below shows the aggregated average score for each functional area from all the 31 health facilities visited. *The M&E Structure, Functions and Capabilities* area has the lowest score. This functional area tells us if the facilities have designated staff for reviewing and aggregating data, for reviewing the data before it moves to the next level, and if the staff has received training. On the other hand, the functional areas related to *Indicators Definitions and Reporting Guidelines*, as well as *Data Collection Tools and Dorms* achieved a "strong system" score.

Figure 1: Sub-County Summary Statistics on Systems Assessment Average Scores by Functional Areas
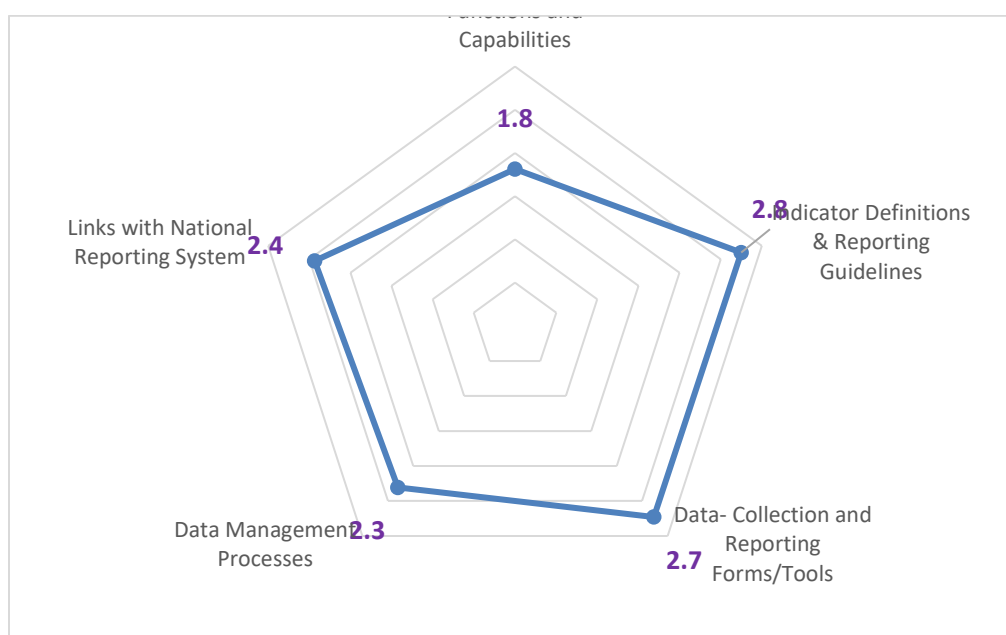
3.3 Availability and Completeness of Source Documents

In some facilities, source documents—i.e., standard registers—for different indicators were unavailable or were found to be incomplete for the assessment period. Table 3, below, presents the proportion of facilities that were found, at the time of the assessment, to have source documents that were available and complete by indicator and county levels.

Table 3: Availability and Completeness of Source Documents

Indicator/Data Collection Tool		ISIOLO (n=11)	MARSABIT (n=20)
Number of women who took iron tablets or syrup during most recent pregnancy	Available (%)	100	95
	Complete (%)	55	65

Number of children ages 6–59 months who were given vitamin A supplements	Available (%)	99	95
	Complete (%)	9	55
Number of children under age 5 who were admitted for treatment of MAM	Available (%)	99	95
	Complete (%)	36	65
Number of children under age 5 who received treatment for SAM	Available (%)	99	75
	Complete (%)	73	70
Number of children under age 5 who received ORS zinc supplementation during an episode of diarrhea	Available (%)	100	80
	Complete (%)	45	70
Number of pregnant women attending first ANC visit	Available (%)	100	95
	Complete (%)	55	70
Number of pregnant women attending fourth ANC visit	Available (%)	100	95
	Complete (%)	45	70

Overall, the availability of the documents for all indicators is high (95-100%). With the exception of source documents for the indicator "*Number of children under five who received ORS Zinc supplementation during episodes of diarrhe*a" in Marsabit (80%). In some health facilities where source documents were not available, the summaries and KHIS were available.

However, completeness rates were much lower and fluctuated considerably, from 36-70%, with a very low percentage for the indicator: "*Number of children aged 6 to 59 Months who were given vitamin A supplements"* in Isiolo. Where available, the teams assessed the completeness of a register based on the extent to which the required data elements were filled in. The results show that incompleteness of source documents was pronounced at health facilities. In several health facilities, tally sheets were presented as source documents, particularly for immunization, whereas their true purpose is for intermediary use to aggregate numbers for different services provided.

4.0 Data Verification and Accuracy

Table 4 below illustrates findings from the recounts done on the available source documents against the summaries. A negative number implies under-reporting while greater than 100 implies over-reporting. For example, "-100%" means that none of the patients expected to be reported in the summary were reported (i.e., there are 10 patients in the source document/registers but 0 reported in the summary). On the other hand, "300%" means that the documents over-reported the figures three times (i.e., there are 10 patients in the source, but the summary shows 30).

The assessment determined the extent to which the data on the summary sheets reflected what was recounted in the source documents. The accuracy of data for majority of the indicators under assessment was very low especially for: "*Number of pregnant women attending 4th ANC visit*". It was also not clear how the data reported is treating first-time visitors and repeat visitors. Most of the data reported in the summary sheet did not match what was counted in the source documents. Some reasons cited included multiple service delivery points, high volume of clients/patients versus low staff numbers, unsupervised recording staff on site and handling of source documents by multiple staff.

4.1 Accuracy of Summary Sheet Against Source Document (registers)

Table 4: Summary Sheet vs. Source Registers (Variance between Register & Summary)

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children ages 6–59 months who were given vitamin A supplements	Number of children under age 5 who were admitted for treatment of MAM	Number of children under age 5 who received treatment for SAM	Number of children under age 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Modogashe Dispensary	ISIOLO	17%	47%	119%	0%	-	5%	67%
Sericho Health Centre	ISIOLO	26%	172%	148%	0%	30%	5%	18%
Badana Dispensary	ISIOLO	-9%	-100%	211%	967%	-100%	-100%	-33%
Malkadaka Dispensary	ISIOLO	-3%	218%	30%	-6%	71%	-7%	300%
Gafarsa Health Centre	ISIOLO	10%	100%	22%	-16%	33%	0%	0%
Garbatulla Sub-County District Hospital	ISIOLO	-4%	42%	5%	-40%	-100%	-10%	26%
Duse Dispensary	ISIOLO	0%	680%	25%	-	33%	-50%	0%
Kinna Health Center	ISIOLO	-5%	35%	5%	43%	-100%	4%	24%

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children ages 6–59 months who were given vitamin A supplements	Number of children under age 5 who were admitted for treatment of MAM	Number of children under age 5 who received treatment for SAM	Number of children under age 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Basa Dispensary	ISIOLO	1%	-100%	-100%	-100%	14%	0%	33%
Mata-Arba Dispensary	ISIOLO	15%	300%	11%	0%	-100%	0%	-50%
Biliqo Marara Dispensary	ISIOLO	-25%	100%	0%	67%	7%	0%	133%
Korr Health Centre	MARSABIT	88%	31%	84%	120%	43%	100%	42%
Burriaramia Dispensary	MARSABIT	0%	0%	96%	31%	0%	79%	77%
Ballah Dispensary	MARSABIT	124%	100%	100%	100%	0%	100%	100%
Gatab Health Centre	MARSABIT	100%	86%	78%	122%	78%	86%	44%
Loiyangalani Health Centre	MARSABIT	154%	121%	101%	37%	0%	67%	90%
Kamboe Dispensary	MARSABIT	-29%	-53%	71%	-50%	8%	0%	-36%
Logologo Health Centre	MARSABIT	13%	-63%	-49%	-20%	-12%	34%	0%
Logologo AIC Dispensary	MARSABIT	5%	4%	-50%	0%	-3%	0%	0%
Lontolio Dispensary	MARSABIT	0%	0%	3%	0%	0%	-3%	5%
Ngurunit Health Centre	MARSABIT	-72%	-26%	-11%	-30%	-63%	-4%	0%
Bubisa Dispensary	MARSABIT	4%	-4%	10%	20%	-32%	5%	33%
Maikona Health Centre	MARSABIT	49%	5%	0%	0%	42%	32%	36%
Boji Dispensary	MARSABIT	-17%	-100%	0%	-	0%	20%	33%
Gus Dispensary	MARSABIT	93%	-5%	3%	14%	23%	0%	-14%
Malabot Dispensary	MARSABIT	-27%	-80%	-50%	50%	-100%	-27%	-67%
Kalacha Sub-County Hospital	MARSABIT	6%	0%	-46%	0%	-	0%	-25%
Elgade Dispensary	MARSABIT	3%	-8%	0%	0%	-100%	0%	0%
Balesa Dispensary	MARSABIT	-2%	9%	-60%	-71%	-60%	0%	0%
El Hadi Dispensary	MARSABIT	0%	200%	0%	-	-63%	0%	0%
Dukana Health Centre	MARSABIT	-11%	-9%	-21%	-7%	-100%	4%	18%

4.2 Accuracy of KHIS Against the Facility Summary Sheet

The accuracy of KHIS data against the facility data summary sheet was assessed for the period under review to establish whether the entries on KHIS matched what was in the summary sheets. Notably, the proportion of matching data between the facility summary sheets and KHIS was very low for all indicators under review. Some of the indicators had zero percent accuracy. The overall average for the summary sheet/KHIS data was 27.7% for the data of the indicators assessed. The results are illustrated in Table 5.

Table 5: Summary Sheet vs. KHIS

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children ages 6–59 Months who were given vitamin A supplements	Number of children under age 5 who were admitted for treatment of MAM	Number of children under age 5 who received treatment for SAM	Number of children under age 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Modogashe Dispensary	ISIOLO	0%	0%	0%	6%	-	-4%	0%
Sericho Health Centre	ISIOLO	0%	-1%	-8%	-8%	-62%	0%	0%
Badana Dispensary	ISIOLO	0%	-	-44%	-33%	-	-	50%
Malkadaka Dispensary	ISIOLO	3%	134%	12%	6%	0%	0%	0%
Gafarsa Health Centre	ISIOLO	0%	0%	-5%	0%	-38%	0%	0%
Garbatulla Sub-County Hospital	ISIOLO	22%	-50%	-31%	50%	-	3%	8%
Duse Dispensary	ISIOLO	0%	-77%	-40%	-	0%	100%	0%
Kinna Health Center	ISIOLO	2%	-23%	29%	40%	-	0%	0%

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children ages 6–59 Months who were given vitamin A supplements	Number of children under age 5 who were admitted for treatment of MAM	Number of children under age 5 who received treatment for SAM	Number of children under age 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Basa Dispensary	ISIOLO	0%	-	-	-	0%	0%	0%
Mata-Arba Dispensary	ISIOLO	0%	-25%	29%	0%	-	0%	0%
Biliqo Marara Dispensary	ISIOLO	48%	-25%	81%	-40%	0%	0%	-71%
Korr Health Centre	MARSABIT	100%	167%	100%	100%	0%	100%	100%
Burriaramia Dispensary	MARSABIT	0%	0%	0%	0%	0%	0%	0%
Ballah Dispensary	MARSABIT	112%	25%	100%	100%	0%	100%	100%
Gatab Health Centre	MARSABIT	100%	40%	100%	100%	100%	100%	100%
Loiyangalani Health Centre	MARSABIT	100%	67%	100%	100%	0%	100%	100%
Kamboe Dispensary	MARSABIT	0%	89%	-33%	0%	85%	0%	114%
Logologo Health Centre	MARSABIT	-11%	330%	90%	0%	-36%	-3%	-5%
Logologo AIC Dispensary	MARSABIT	0%	-12%	0%	0%	-37%	33%	-42%
Lontolio Dispensary	MARSABIT	0%	-50%	0%	0%	0%	0%	0%
Ngurunit H/C	MARSABIT	-12%	-100%	-38%	-57%	67%	-38%	-36%
Bubisa Dispensary	MARSABIT	0%	29%	-46%	-50%	0%	0%	0%
Maikona Health Centre	MARSABIT	0%	10%	74%	0%	0%	0%	0%

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children ages 6–59 Months who were given vitamin A supplements	Number of children under age 5 who were admitted for treatment of MAM	Number of children under age 5 who received treatment for SAM	Number of children under age 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Boji Dispensary	MARSABIT	-7%	-	-100%	-	-33%	0%	0%
Gus Dispensary	MARSABIT	-21%	-45%	0%	38%	0%	0%	0%
Malabot Dispensary	MARSABIT	0%	0%	-100%	-100%	-	0%	0%
Kalacha Sub-County Hospital	MARSABIT	0%	0%	0%	0%	-	0%	0%
Elgade Dispensary	MARSABIT	-8%	-27%	0%	0%	-	0%	0%
Balesa Dispensary	MARSABIT	-70%	0%	0%	0%	0%	0%	0%
El Hadi Dispensary	MARSABIT	0%	167%	0%	-	0%	0%	0%
Dukana Health Centre	MARSABIT	0%	-7%	0%	0%	-	0%	0%

4.3 Accuracy of KHIS Against Source Documents (registers)

The accuracy of DHIS data against the source documents was assessed for the period under review to establish whether the entries matched what was in the source documents. Notably, the proportion of matching data between the source documents and DHIS was also very low for all indicators under review. The results are illustrated in Table 6.

Table 6: Source Document vs. KHIS

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children 6-59 Months who were given vitamin A supplements	Number of children under 5 who were admitted for treatment of MAM	Number of children under 5 who received treatment for SAM	Number of children under 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Modogashe Dispensary	ISIOLO	17%	47%	119%	6%	-	0%	67%
Sericho Health Centre	ISIOLO	26%	169%	129%	-8%	-51%	5%	18%
Badana Dispensary	ISIOLO	-9%	-100%	74%	617%	-100%	0%	0%
Malkadaka Dispensary	ISIOLO	0%	645%	45%	0%	71%	-7%	300%
Gafarsa Health Centre	ISIOLO	10%	-	16%	-16%	-17%	0%	0%
Garbatulla Sub-County District Hospital	ISIOLO	17%	-29%	-27%	-10%	-100%	-8%	37%
Duse Dispensary	ISIOLO	0%	80%	-25%	-	33%	0%	0%
Kinna Health Center	ISIOLO	-3%	4%	36%	100%	-100%	4%	24%
Basa Dispensary	ISIOLO	1%	-100%	-41%	-82%	14%	0%	33%
Mata-Arba Dispensary	ISIOLO	15%	200%	42%	0%	-100%	0%	-50%
Biliqo Marara Dispensary	ISIOLO	11%	50%	81%	0%	7%	0%	-33%
Korr Health Centre	MARSABIT	88%	53%	84%	120%	0%	100%	100%
Burriaramia Dispensary	MARSABIT	0%	0%	0%	0%	0%	0%	0%
Ballah Dispensary	MARSABIT	90%	25%	100%	100%	0%	100%	100%
Gatab Health Centre	MARSABIT	100%	86%	100%	122%	78%	86%	44%

Service Site Statistics	County	Number of women who took iron tablets or syrup during most recent pregnancy	Number of children 6-59 Months who were given vitamin A supplements	Number of children under 5 who were admitted for treatment of MAM	Number of children under 5 who received treatment for SAM	Number of children under 5 who received ORS zinc supplementation during episode of diarrhea	Number of pregnant women attending 1st ANC visit	Number of pregnant women attending 4th ANC visit
Loiyangalani Health Centre	MARSABIT	100%	53%	101%	37%	0%	67%	90%
Kamboe Dispensary	MARSABIT	-29%	-10%	14%	-50%	100%	0%	36%
Logologo Health Centre	MARSABIT	1%	59%	-2%	-20%	-44%	30%	-5%
Logologo AIC Dispensary	MARSABIT	5%	-8%	-50%	0%	-39%	33%	-42%
Lontolio Dispensary	MARSABIT	0%	-50%	3%	0%	0%	-3%	5%
Ngurunit Health Centre	MARSABIT	-76%	-100%	-44%	-70%	-38%	-40%	-36%
Bubisa Dispensary	MARSABIT	4%	24%	-41%	-40%	-32%	5%	33%
Maikona Health Centre	MARSABIT	49%	16%	74%	0%	42%	32%	36%
Boji Dispensary	MARSABIT	-22%	-100%	-100%	-	-33%	20%	33%
Gus Dispensary	MARSABIT	53%	-48%	3%	57%	23%	0%	-14%
Malabot Dispensary	MARSABIT	-27%	-80%	-100%	-100%	-100%	-27%	-67%
Kalacha Sub-County Hospital	MARSABIT	6%	0%	-46%	0%	0%	0%	-25%
Elgade Dispensary	MARSABIT	-5%	-33%	0%	0%	-100%	0%	0%
Balesa Dispensary	MARSABIT	-71%	9%	-60%	-71%	-60%	0%	0%
El Hadi Dispensary	MARSABIT	0%	700%	0%	-	-63%	0%	0%
Dukana Health Centre	MARSABIT	-11%	-16%	-21%	-7%	-100%	4%	18%

5.0 Dissemination of RDQA Findings

5.1 Dissemination Workshop Structure and Content

A two-day dissemination workshop was held for each county. The dissemination workshop was structured with a plenary session review of the RDQA report, and small group discussions dissecting the findings and developing a mitigation plan to address inconsistencies detected on day one. On the second day, sessions were structured through data analysis of the RDQA in which participants received a hands-on analysis of their report and developed a better understanding of data quality issues. The workshop was organized along a distinct set of analytical outputs to inform the monitoring of progress and the assessment of health information systems performance.

The dissemination workshop broadly looked at the RDQA report with the following categories:

1. Coverage: Coverage estimation and analysis of key indicators
2. Health impacts/effectiveness: Estimation from multiple data points for core indicators, e.g., child health, maternal health, linking coverage to impact
3. Overall performance assessment: Benchmarking County performance, bringing results, effectiveness, equity, and efficiency
4. Challenges and recommendation-need for policy: From information to action, institutional capacity, communication, and dissemination of data
5. Guide to developing mitigation plan

5.2 Detailed Workshop Activities

The RDQA dissemination workshop was held at the Isiolo, Saala Hotel, from November 29, 2021, to December 2, 2021. The Marsabit team arrived on November 29 and November 30, and the Isiolo team arrived on December 1 and December 2.

5.2.1. Day 1 RDQA Finding Dissemination to Senior Management

Participants in the one-day dissemination event shared key findings from the RDQA and received feedback during moderated roundtable discussions led by senior management from each county. The RDQA report was disseminated, main findings were validated, and participants developed a mitigation plan.

a. From the findings, it was noted that:

- Most of the data tools (registers and summary forms) are available but not completed—some facilities are using outdated data tools,

- In some instances, registers and summary sheets were not available in the facilities; and

- The types of available documents ranged from standard registers to improvised counter books to older versions of the registers.

During the dissemination session, the consultant presented the key findings of the RDQA, and participants were reminded that:

- The counties needed a robust health information system to support the performance monitoring of health programs and to track progressive improvement improvements in the health status of the citizenry as embedded in the Kenyan Vision 2030.

- The Constitution of Kenya 2010 states that every person has a right to the highest attainable standards of health, which includes the right to health care services: hence, the need for transparency and accountability, and public participation in monitoring health sector performance.

5.2.2. Day 2 Routine Data Quality Assessment Analysis

On the second day of the workshop, the team guided the county and sub-county management teams on how to analyze the RDQA tool and reporting. The participants were keen to understand the activities conducted on data analyses and stayed after the workshop to continue the discussions.

a. **Discussions around data analysis included the following:**

- The RDQA data collection of Excel sheets from the county health facilities and the summarized data

- Summary of the recounted data, summary data from the summary tools, KHIS data for the relevant indicators

- Comparison across the different data sources and the proportion for accuracies

- The five key areas of qualitative assessment (M&E Structure, indicator definitions, data collection reporting forms and tools, data management processes and links with the national reporting system)

- The graphs generated based on the comparison between facility records (registers, summary forms and the KHIS)

- The monitoring and evaluation structure and functions that were scored from 0 to 3, highest to lowest, and a spider web chart generated to determine strength and weakness

- The data quality dimensions/standards that were measured based on the availability of documents, provider capacity and knowledge of the indicators, frequency of reporting, complete reporting based on data elements, etc.

- Comparison of accuracy between facility registers, summary forms and KHIS in percentage (zero means no variation).

The participants were arranged in groups to analyze data collected from the health facilities during the RDQA. They developed bar graphs comparing data from the registers, summary forms and KHIS. They also compared data from different health facilities so they could identify quality issues between health facilities. A three-way analysis of variance (register vs. summary form, register vs. KHIS and summary form vs. KHIS) was also conducted to identify specific quality issues.

In the afternoon, participants were divided into five and two groups for Marsabit and Isiolo, respectively, to discuss data quality issues, challenges and recommendations that resulted from the RDQA in greater detail. A mitigation plan was also developed ensuing this discussion. The groups were tasked with the responsibility of looking at the seven challenges and developing a mitigation plan (see Annex 1).

5.3. General Dissemination Workshop Challenges

The workshop was designed to address data analysis with participants that benefited from the training on RDQA. The following challenges were identified:

- Isiolo County participants did not have a full dose of both the dissemination and the data analysis training. The dissemination coincided with World AIDS Day, and the higher-level participants had to choose between the two events.

- Some participants did not attend the RDQA training in August and, as a result, they could not make sense of the data analysis.

- Some high-level managers from both counties were not able to attend the dissemination workshop and thus were unable to have first-hand input in the development of actioned mitigation measures.

- They were not enough time to address dissemination, validation, and data analysis.

- The consultant reviewed workshop materials several times because of changes in objectives and number of days for the training.

5.4. Recommendations Emerging from the Workshop

- Organize enough time for dissemination and training. Dissemination activities are very important; they not only serve to increase knowledge but also to bring advocacy to a higher level.

- Organize a one-on-one dissemination and advocacy on data quality and the mitigation plan with senior management from the two counties.

- Follow up with the two counties on the implementation of the mitigation plan.

- Schedule programs with consideration of other commitments like World AIDS Day.

5.5. Challenges From findings

The dissemination was concluded with key challenges that include:

- Staff attrition in facilities led to the deployment of new staff who had not been trained on KHIS tools, which resulted in lack of knowledge on how to complete the registers and summary forms accurately.

- In some health facilities, registers and summary forms were not available, leading to providers using sheets of papers to fill in client information, which inadvertently affected data quality. In some health facilities, the registers were available but were not utilized effectively because the providers recorded information intermittently. A shortage of data collection and aggregation tools led to health facilities improvising on registers leading to the non-standardization of data collection and errors. The proportion of matching data between source and summary tools was less than 40% for all indicators. The proportion of matching data between summary tools and KHIS was much higher than the proportion of matching data between source and summary tools. Data management processes, quality assurance and indicators definitions remain a weak point in the HIS.

6.0. Conclusion

- Staff attrition and redeployment of new staff who had not been trained on National Health Management Information Systems (NHMIS) tools slowed down the DQA process in some health facilities.
- There were missing filled tools in some HFs; thus, it was not easy to get all the data for the period under review, e.g., once a tool is filled up, they are removed from the HF.
- Some registers not in use.
- Shortage of data collection and aggregation tools led to facilities improvising on tools, leading to the non-standardization of data collection and errors.
- The proportion of matching data between source and summary tools was less than 40% for all indicators.
- The proportion of matching data between summary tools and DHIS was much higher than the proportion of matching data between source and summary tools.
- Data management processes, quality assurance and indicator definitions still remain a weak point in the HIS.

6.1. Key Recommendations from Data Collection

To address the data accuracy and contributing systemic issues, concerted and collaborative efforts by all stakeholders at all levels is needed with the support of leadership at both the national and county levels. Recommendations based on findings are outlined as follows:

- Awareness of the importance of data and data quality for top leadership at both the national and county level is crucial to get buy-in and accentuate the need to invest in data quality.
- Comprehensive data quality assurance plans at the national and county levels to address the myriad issues identified in the RDQA. These include HIS human capacity building strategies, indicator definition and training, tools standardization and availability and data governance issues, among others.
- Develop a data quality protocol that outlines the roles and responsibilities at different levels.
- Dissemination of the data quality protocol that outlines the roles and responsibilities at different levels should be fast-tracked at the national level and to the counties.

- Greater investments in technology to minimize repetitive and tedious data recording and compilation activities that contribute to data errors. This will be informed by the utilization and training of available technology. (This could be in the form of EMRs and other technology that have the capability to aggregate, validate and transfer data to DHIS according to the MoH requirements).

- Enhancements of data collection systems are vital to accommodating the various needs of stakeholders to mitigate against parallel systems.

- Efforts to promote data use should be increased at all levels through targeted interventions like performance reviews, product generation and decision-making based on data.

- Development and institutionalization of regular data quality check mechanisms at the facility level are necessary to identify and address data issues such as inaccurate records, incomplete data, double counting and aggregation errors.

- Counties should develop regular supervision by sub-county/county HRIOs/national level to provide technical support, ensure adherence to standard tools and data management procedures at the facility level as well as to identify gaps that need to be addressed, e.g., stock-outs of tools and other supplies.

- Concern Worldwide in collaboration with county stakeholders, to take lead in rolling out the actioned mitigation plan.

Annex 1: Mitigation Plan Marsabit

S/N	Problem	Action Plan	Cost Implication Ksh	Source of Funds	Person(s) Responsible	Timeline
1.	Inadequate registers and reporting tools	• Advocate for funds for printing and distribution • Printing of 4,000 copies HMIS tools • Distribution of HMIS tools	Ksh. 4,000,000 Ksh. 2,000,000	COH/Partners	COH/Partners	January 31, 2022
2.	Capacity gaps on HMIS tools	Training of 20 trainers on routine data management	Ksh. 1,260,000	COH/Partners	COH/Partners	February 31, 2022,
		Training of 250 health care workers on HMIS tools	Ksh. 12,600,000	CGM/ Partners	COH/Partners	March 31, 2022,
3.	Inadequate human resources at all levels	Recruitment of health care workers (All cadres)	Ksh. 100,000,000	CGM	CGOM/CPSB	2022/2023
4.	Inadequate utilization of data for decision making	Conduct monthly facilities staff meeting	0	CGM & Partners	Facility in charges	Continuous
		Conduct quarterly in charges review meeting at sub-county levels	Ksh. 6,000,000	CGM & Partners	SCMOH/Partners	Yearly
		Conduct quarterly CHMT/SCHMT data review meeting at county levels (20 SCHMT, 10 CHMT)	Ksh. 2,016,000	CGM & Partners	COH/Partners	Yearly
5.	Inconsistency data quality assessment (DQA)	Conduct quarterly data quality assessment	Ksh. 3,360,000	CGM & Partners	COH/Partners	Yearly
6.	Compilation error when entering data	1. Daily page and tally sheet summary. 2. Counter checking by colleague 3. Monthly data review meetings at facility level.	NIL	NIL	Facility In charge	Every end Month
7.	Registers not utilized (new tool)	1. Quarterly Supportive supervision 2. OJT/mentorship	Ksh. 3,200,000	CGM & Partners	SCHRIO	Yearly

S/N	Problem	Action Plan	Cost Implication Ksh	Source of Funds	Person(s) Responsible	Timeline
8.	Unequal staff distribution especially (CHAs and nutritionist)	Proper redistribution of staffs (nutritionist and CHAs) across all four sub-counties	Ksh 5,000,000	CGM	COH, CEC and Directors	By February 2022
9.	Data entry error into KHIS	Accuracy check Refresher training for HRIOs, sub-county and county HMT managers on KHIS revised version	- Ksh. 1,101,800	CGM & Partners	SCHRIOs COH/Partners	Monthly March 2022
10.	Poor mode of data management	Digitalization of data entry for 107 HF -Procurement of all-in-one desktops (107) -Data handling to be done by the responsible officer (unless otherwise)	Ksh. 8,500,000	-County Government of Marsabit -Partners	CO Health	June 30, 2022
11.	Duplication of tools by retention of old tools	-Harmonization of registers outreach/static facility register	NIL	-County Government of Marsabit	CHRIO	January 31, 2022
12.	Lack of facility-based M&E framework	-Establish M&E framework at all levels (Sub- County and facility) -Training of 107 HCW	Ksh. 2,500,000	-County Government of Marsabit -Partners	-County M&E Coordinator	September 30, 2022
13.	Inadequate ICT Equipment	Procurement/purchase equipment-(desktops, laptops, bundles, (8 laptops)	Ksh. 400,000	County Government of Marsabit -Partners	CO Health	3rd Quarter-FY 2021/2022

Annex 2: Mitigation Plan Isiolo

S/N	Problem	Action Plan	Cost Implication	Person(s) Responsible	Timeline
1.	Staff attrition and redeployment of new staff who have not been trained on NHMIS tools slowed down the DQA process	Capacity building of all staff in Garbatulla and Merti sub-counties	Ksh. 8.25 M (Training all 150 staff in Garbatulla and Merti sub-counties. Assuming cost per participant is 55,000 for 5 days)	County Director of Health services, partners, County HRIO, County Nutrition, M&E Personnel	February 15, 2022
2.	Missing tool	-County government to allocate funds to purchase /print/distribute data collection tools during their annual budgeting -Partners supporting health activities to support the county government in sourcing the data reporting tools	Ksh. 1.1M (17 copies per 30 facilities @ 2000)	County Director of Health services, Partners, County HRIO, County Nutritionist	January 30, 2022
3.	Some registers not in use	Quarterly OJT on the updated registers	Ksh. 1.2M OJT by 3 health management teams covering one facility per day (4 x5 days x 2 x 4 7000k)	County HRIO, County Nutritionist. County Nurse and partners	January 31, 2022
4.	The proportion of matching data between source and summary tools was less than 40% for all indicators	Quarterly routine data audit and supportive supervision	1.4 M (10 CHMT/HMT members 10 people doing data quality audit for 5 days x 4 sub-counties @ Ksh. 7000)	County Director of Health services, together with County HRIO, County Nutrition, M&E Personnel	January 31, 2022
5.	The proportion of matching data between summary tools and DHIS was much higher than the proportion of matching data between source and summary tools.	Quarterly routine data audit and supportive supervision	1.4 M (10 CHMT/HMT members 10 people doing data quality audit for 5 days x 4 sub-counties @ Ksh. 7000)	County Director of Health services, together with County HRIO, County Nutrition, M&E Personnel	January 31, 2022

S/N	Problem	Action Plan	Cost Implication	Person(s) Responsible	Timeline
6.	Lack of EMR tools	To Procure, install EMR Tools in the 30 health facilities		County government/partners	April 30, 2022
7.	Lack of regular external data audit	Engage external consultants/specialists annually			
8.	Staff attrition	Redistribution of staff	-Transfer allowance -Disturbance allowance -Transport allowances	COH/CDH/CHMT	January 30, 2022
9.	Redeployment of new staff who have not been trained on NHMIS tools slowed down the DQA process	Train all new staffs on data quality management	Ksh. 1,560,000	COH/CDH/CHRIO	January 30, 2022
10.	Shortage of data collection and aggregation tools	Procure reporting tools	Ksh. 3,900,000	COH/CDH/CHRIO	April 30, 2022
11.	Data management processes, quality assurance, and indicators definitions still remain a weak point in the HIS	OJT and Mentorship	Ksh. 550,000	COH/CDH/CHRIO	January 30, 2022
12.	The proportion of matching data between summary tools and DHIS was much higher than the proportion of matching data between source and summary tools.	Reconciliation of data and sharing with other HRIOs during data entry County and sub county team to view data in DHIS and call to make corrections	Ksh. 500,000	COH/CDH/CHRIO/SCHRIOs/HRIOs	December 30, 2021
13.	The proportion of matching data between source and summary tools was less than 40% for all indicators	Sharing of data with colleagues at facility level	Ksh. 50,000	NO, I/C	Every 1st week of the month
14.	Some registers not in use	OJT and mentorship during distribution	Ksh. 550,000	COH/CDH/C/SCHRIO	January 30, 2022

S/N	Problem	Action Plan	Cost Implication	Person(s) Responsible	Timeline
15.	Shortage of staff	Employ new staff		COH/CDH	
16.	Having new staff in the facility	Mixing new and old staffs		CDH/CHMT	
17.	Inaccurate and late reporting of data to KHIS	Train HRIOs on accuracy and timely reporting of data	Ksh. 600,000	CHRIO	January 30, 2022