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Project Work on

IMPROVE DATA QUALITY AND INFORMTION USE IN THE OUT-PATIENT DEPARTMENT (OPD) OF JINELLA HEALTH CENTER

BY

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Declaration

I,Dereje Feleke, do here by declare that this project report has not been submitted to Addis Ababa University or any other Universities for any academic award.

I have followed all the ethical principles of scholarship during the baseline assessment, implementing interventions and reviewing post interventions improvements of this project I confirm that I have cited and referenced all source documents used in this project work. This project work is submitted in partial fulfillment of the requirements for the Master of Science degree from school of graduate studies at Addis Ababa University.

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Finally I wish to thank all my friends who continuously encouraged and made it possible for me to finish this paper.

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List of Acronyms

CSA	Central Statistics Agency
FMOH /M &E	Federal Ministry of Health/Monitoring and Evaluation
HIS	Health Information System
HIT	Health Information Technician
ICT	Information Communication Technology
HMIS	Health Management Information System
HMN	Health Metric Network
LQAS	Lots Quality Assurance Sampling
MAT	Management Assessment Tool
OPD	Out Patient Department
OBAT	Organizational and Behavioral assessment Tool
PMT	Performance Monitoring Team
PF	Plasmodium Falciparum
PRISM	Performance of Routine Information System Management
RHIS	Routine Health Information System
STI	Sexually Transmitted Infection
TB	Tuberculosis
WHO	World Health Organization

Operational definition

Completeness: was quantified by number of selected data elements filled against the total number of data elements that the OPD was supposed to fill.

Self administered questionnaire: In this project to mean that questionnaires were filled in the presence of project manager/researcher.

Project manager:- Is a person who conduct/execute this project

Data management: This encompasses data handling from compilation, storage and retrieving.

Determinants: Are factors or elements guiding and limiting use of routine health data and information

Technical determinants: Processes, method to collect, review, user friendliness of HMIS tools like registers, reporting forms and complexity of IT.

Behavioral determinants: Covers only motivation and confidence level of Jinella health center staffs to do HMIS tasks.

Organizational determinants: For this project purpose it is to mean that promotion of information culture, supervision quality and availability of HMIS resources.

A project: An intervention that consists of a set of planned, interrelated activities designed to achieve defined objectives within a given budget and a specified period of time.

Data accuracy: was determined by comparing the data recorded in the monthly register with the data obtained from facility reports during data audits.

$$\text{Accuracy} = \frac{\text{Total No recorded data on the register}}{\text{Total No of reported data}} \times 100$$

Abstract

Background:-The importance of a health management information system (HMIS) cannot be ignored because health policies and planning in any country, mostly, depend on the correct and timely information on various health issues. Effective health management information system is essential for setting priority for community based problems, for allocation of budget and human resource and decision making to managers and stakeholders. In Ethiopia, HMIS is mostly incomplete, inaccurate, and un-timely which makes it of little help in decision making for planning and management of health services.

Objective:-The aim of this project was to improve data quality and information use in out - patient department (OPD) of Jinella health center**,** Harari region.

Methodology:- Both quantitative and qualitative methods were used and the overall project period was between December 2015-June 2016. Data was collected through closed and open-ended questionnaires, using interview, observation and analysis of certain documents. To identify the existing level of data accuracy and information use practice data from register and reports during July 2015-December 2016 were analyzed. Microsoft Excel was used to enter and analyze the data. The project involved data collected before and after the data quality and information use improvement intervention. Descriptive statistics were used for most of the study variables and frequency distribution tables were used to describe some of the findings.

Result:-There was a marked improvement in data quality in terms of (completeness and accuracy) which increased level of accuracy from 88.9% at baseline to 95.1% and increased completeness from 85.4% at baseline to 100% by the end of the project there was improvement in information use. The identified limiting factors of data quality and information use at Jinella health center were Improper HMIS disease classification and identification, absence of integrated plan, over/under reporting, poor supportive supervision, lack of motivation and confidence, absence of feedback system to departments. After determinants identified possible solutions were proposed and interventions were made.

Conclusion:- For improving HMIS data quality and information use practice in local action oriented performance monitoring; simple, practical and scalable improvement interventional activities were carried out throughout the project. As a result, the encouraging improvements were achieved in terms of increasing proportion of data accuracy and completeness of monthly HMIS reporting as well as on information use practice in Jinella health center.

Chapter one

1.Introduction

1.1 Background

Many low- and middle-income countries have developed ambitious health policies and strategies to improve Health Service Delivery (HSD) and attain the health-related Millennium Development Goals, but have difficulty in matching implementation with their aspirations [1]. Ethiopia is one of the many low-income countries that have implemented several strategies of significant scale in recent years to improve HSD.

A Health Management Information System (HMIS) is an essential tool for strengthening planning and management in the health facilities. Any conventional HMIS enables monitoring of service delivery in terms of access, coverage, expenditure, human resources, disease profiles and health outcomes [3]. HMIS is also a process whereby health data are recorded, stored, retrieved and processed for decision-making to improve the management and optimum use of resources of program and to make timely decisions to resolve constraints and problems of implementation [2].

The regular use of reliable information from a well-designed routine health information system is indispensable for ensuring and sustaining improvements in health system performance. Using reliable information from HMIS over time is an important aid to improving health outcomes, tackling disparities, enhancing efficiency, and fostering innovation [5]. The need for structured evaluations focusing on health information systems to determine factors affecting performance and to identify best practices has been noted in the literature [6]. Data delivered through the HMIS come from service delivery and administrative records kept as part of routine transactions at health facilities and management offices. In a well-performing HMIS, data should come from every Health Institution in the country. In Federal Ministry of Health Ethiopia (FMOHE) Health Institutions HMIS/M&E is weak, with the exception of some local and regional institutions where HMIS/M&E performance provides benchmark and best practice examples. At other governmental Health Institutions and private sector for-profit and not-for-profit institutions, HMIS/M&E is weak to non-existent, again with the exception of some best performers,[2].These gaps in completeness compromise Health Institutions direct management of public facilities and

collaboration with other Ministries and the private sector to improve health status and use of health resources,[2].

In Ethiopia, despite the current effort to decentralize decision making and building capacity at the district and facility level, the data quality and use of information for local action-oriented performance monitoring found to be weak which need serious commitment for its improvement. To improve HMIS performance producing better quality data and continuous use of information; not only technology acquisition will be required but it should also be viewed as a long-term socio-cultural, political and technical development process. It is equally important to improve the understanding of health managers and health professionals on the importance of quality health data as well as the proper analysis of the available data and use of information for improved health service management at each level of health system. This can be achieved only through proper interventions and increasing the proportion of staffs that are competent enough on HMIS tasks leading to better performed HMIS process producing better quality data and continuous information use for local action-oriented performance monitoring [3].

Thus, this project is intended to improve the HMIS data quality and information use practice by availing accurate and complete data and strengthen the use of locally generated data for evidence based decision making in case of Jinella health center.

1.2 Statement of the problem

It is known that safe, reliable health and social care depends on access to, and the use of, high quality information. High quality information is an important resource for service providers in planning, managing, delivering and monitoring high quality health care services.

At present, the health information systems in many low and middle-income countries tend to be “data-rich” but “information-poor”’[8]. Data analysis is the process of transforming raw data into usable information that adds value to the statistical output [9]. Key problems of Health Information use in Kenya revealed that: Lack of staff competence, multiple HIS tools, lack of computers, lack of information use culture promotion, lack of support of staff training in HIS skills, lack of support supervision on information use, lack of staff motivation and recognition for well done job, were the factors influencing Health Information use [12].

Inaccurate, untimely, incomplete and inconsistent data are common challenges in planning, monitoring and evaluation of health sector performance in many sub-Saharan African settings including Ethiopia [4].

Often presented as a scientific work, analysis can be both quantitative and qualitative. To meet the increasing demand for information to measure performance against national priorities and policies, there is an urgent need to increase the data analysis skills of information producers.

HMIS attempt to produce timely and quality information about what is happening in the health sector organizations to measure their performance. HMIS Performance is measured by the level of data quality and continuous use of information generated by the system. Ideally this information is then used to guide day to day operations, monitor performance, learn from past results, and improve accountability. However, the system designed to track health data often short fall of this ideal. Data quality may be low, processes for using data other than sending reports may not exist or manager or staffs may have limited understanding of the importance of the information [7].

The Ethiopian national health information system assessment report of 2007 identified that the health management information is among the major problems of the sector. It is characterized by uneven and inadequate staff skill and the information flow is also fragmented and characterized by parallel reporting system with no integration among the various subsystems. This resulted in redundant and conflicting reports and poor quality of data in terms of accuracy and timelines [10].

HMIS progress assessment was conducted in three regions of Ethiopia: Benishangul-Gumuz**,** Gambela and Harari that are implementing the new HMIS. The assessment was conducted in 2009, by Federal Ministry of Health (FMOH) in collaboration with Health Metrics Network (HMN) to document and share lessons and to help guide the next steps [11]. The assessment revealed that availability of the HMIS registers, forms, disease classification list at Outpatient Department (OPD) and tools was not up to the needs of the health facilities included in the study. Strong health management information systems have been identified as critical for addressing health challenges and improving health service delivery at all levels of health system. In Ethiopia data quality and use remain weak, particularly at district health offices and primary

health care (PHC) facilities. Capacity building, standardized and integrated data collection and reporting, information use, and use of appropriate technology have been identified as critical factors to strengthening and improving health sector health management information system [2].

Although reliable and timely health information is the foundation of public health action, it is often unavailable due to under-investment in systems for data collection, analysis, dissemination and use. The rationale for HMIS has been that the availability of operational, effective and efficient health management information systems is an essential component of the required district management capacity [13, 14]. Many data elements critical to high quality care were not recorded completely or accurately at enrollment or follow-up [15]. In addition resistance to change, which comes in form of individual actors having certain viewpoints and understandings of the nature and purpose of the HMIS, based on their past experience is a problem [16].

Consequently, decision-makers cannot identify problems and needs, track progress, evaluate the impact of interventions and make evidence-based decisions on health policy, programme design and resource allocation. The access and use of information by program managers and service providers help resolve bottlenecks and improve program implementation. This eventually leads to improvement in health service delivery and thereby improvement in the health status of the population.

Harari region is one of the pioneer regions that started HMIS implementation as a pilot but still all the above mentioned problems are the typical features of the region so this project was designed to help to Improve data quality and information use in the out- patient department (OPD) of Jinella health center **,** Harari region.

1.3 Objective

1.3.1 General Objective

The aim of this project was to improve data quality and information use in the out-patient department (OPD) of Jinella health center, Harari region.

1.3.2 Specific Objective

The specific objective of this project was:-

- ✓ To do a baseline assessment on OPD of Jinella health center in relation to data quality & information use
- ✓ To identify the technical, organizational and behavioral factors affecting data quality and information use.
- ✓ To perform an intervention on factors that affect data quality and information use
- ✓ To evaluate the progress on quality of data and information use.

1.4 Scope and limitation of the project

1.4.1 Scope of the project

This study focuses on the assessment of the HMIS based on Health Matrix Network (HMN) and Performance of Routine Information System Management (PRISM) framework.

It is expected that the HMN Framework will serve several purposes: as a diagnostic tool, as a roadmap, as an accreditation tool, and as a tool to focus investment and technical assistance for HIS. Based on these the study takes into account and limited its execution as per the following scopes:-

-The project was restricted to OPD of Jinella health center at Harari regional health bureau, Ethiopia.

- Data quality was measured only for its completeness and accuracy.

-The overall project period was between December 2015-June 2016.

1.4.2 Limitation of the project

- Time and budget limitation
- The health center is the busiest health center in the region in terms of high patient load so most of the staffs including health center head were busy on their daily routine activity.
- Experience of the project manager for executing such kinds of interventional project.
- Existence of Limited number of literature on such kinds of interventional projects.

1.5 Significance of the study

Even though, the study was targeted to fulfill an academic requirement; it can serve as a benchmark for reviewing the HMIS situation in the region so as to address the problem areas.The results can also be used as a reference by other similar projects to determine the factors affecting the quality of data and implementation of the (HMIS) system based on the pre-identified priority. The study also adds more knowledge on utilization of routine health management information in strengthening health systems performance to improve health status of the served population.

chapter two

2.0 Literature Review

2.1 Definition and concepts of HMIS

Health management information system (HMIS) is a system that allows the collection, storage, compilation, transmission, analysis and usage of health data that assist decision makers and stakeholders manage and plan resources at every level of health service. It is also used to improve patient satisfaction with health services by tracking certain dimensions of service quality.

Purposes of HMIS:-

- Routine collection and aggregation of quality health information
- Availing accurate, timely and complete data
- Provide specific information support to health decision making process
- Strengthening the use of locally generated data for evidence based decision making [18].

2.2 HMIS Data Quality

Data quality is essential for its effective use in decision making: Quality is what engenders trust in data, and data perceived to be of poor quality are unlikely to be used. Moreover, managers require accurate, complete, and timely data in order to accurately target resources for effective management of the health system. Data quality involves a complex mosaic of issues relating to organizational procedures, processes, and institutional capacity, and cannot be assessed just by looking at one factor in isolation [5].

Data Quality is entirely dependent on the following;

Relevance: When information needs of the health system for routine monitoring of program performance [18].

Timeliness: data is collected, transmitted and processed timely without delay [18].

Accuracy: collected information is accurate and consistent [18].

- **Completeness:** could be of two types namely

• At service delivery point, it refers to all the relevant data elements in a patient/client register are filled

• At Health Administrative point – data completeness has two meanings [18]:

1. All the data elements in a database or report are filled

2. The health administrative unit has reports from all the health facilities and/ or lower level health administrative units within its administrative boundary.

Precision: Data collected and analyzed should be large enough and have sufficient detail to support the decision and to take action [18].

Integrity: Data have integrity when the system is used to generate and is protected from deliberate bias or manipulation [18].

Reliability: The data generated by a program's information system are based on protocol and procedure that do not change according to who is using [18].

Data Quality Assurance Tools: LQAS methodology

Lot Quality Assurance Sampling (LQAS) - is a technique useful for assessing whether the desired level of data accuracy has been achieved by comparing data in relevant record forms (i.e. registers or tallies) and the HMIS reports [18].

Basic Principles of LQAS

- A method for testing hypothesis, e.g. desired level of HMIS data quality is achieved (or not)
- Small random sample for a lot/supervisory area is used(A sample size of 12 also serves well)
- If the number of sampled items not meeting the standard exceeds a pre-determined criterion (decision rule), then the lot is rejected or considered not achieving the desired level of pre-set standard

- "Decision rule" table is used for determining whether the pre-set criterion is met or not
- Aggregating LQAS data from multiple supervisory areas can give us mathematical percentage of the level of achievement.
- Comparing LQAS results over time can also indicate if there is any change or not.

2.3 Ensuring data quality

A wide range of policies and process are needed to ensure data quality. One guiding principle is to reduce the necessary amount of information to a "minimum dataset". This will then reduce the burden of data collection and this alone should improve data quality. Other management actions to improve data are regular local quality control and data-use checks, the use of clear definitions of data elements, up-to-date training, and frequent feedback to data collectors and users. When electronic communication facilities are available, data can be entered at decentralized locations to provide immediate reporting to all levels [8].

Low quality data thus, results in poor performance monitoring which results in inappropriate decision making. Therefore, there is a need to measure the quality of data generated and ensure the information use culture at Jinella health center.

2.4 HMIS Information Dissemination and use

Information can be disseminated through annual/biannual health bulletin, Website and sharing best practice to users with emphasis to use the generated information for various levels of the health system service including system management, planning, advocacy and policy development. Each level has a broad range of users from different technical disciplines and vocations with associated vocabularies and communication methods. A principle of HMN is that country information should be made a core part of the day-to-day management of health system planning and delivery. Thus, access and use should be integral to health information system strengthening activities.

The dynamic links between demand, supply and quality of information should be addressed by encouraging a culture in which information is demanded and its use promoted sustainably [13]. Information produced by the RHIS should be *disseminated,* or shared, with all *stakeholders,* those who would use it to advance the mission of the health system. RHIS information should

also be shared with, or *feedback to*, data producers at lower levels. Quality information products should be developed, including visual aids such as charts and maps, and mechanisms for dissemination, such as a Web portal [5].

2.5 Performance of routine information system management (PRISM) Framework

PRISM is a conceptual framework developed by MEASURE Evaluation and John Snow Inc, acknowledges the broader context in which Routine health information systems (RHIS) operate. It emphasizes strengthening RHIS performance through better data quality and improved information use. PRISM includes three key categories of determinants: 1) Behavioral 2) Technical and 3) Organizational.

Behavioral determinants include the knowledge, skills, attitudes, values, and motivation of the people who collect and use data; technical determinants includes data collection forms, processes, systems, and methods; and organizational determinants comprises of information culture, structure, resources, and roles and responsibilities of key contributors at each level of the health system [19].

As information is the product of data transformation, the quality of the information in the RHIS means quality data, which equates to the data's comprehensiveness, validity, accuracy, and fitness for use, among other benefits. Although operational in most developing countries, the RHIS in those countries are described as ineffective for several reasons: insufficient comprehensiveness of the information, the poor quality of the data collected, and low levels of use in real-time decision-making. Traditionally, according to the literature, the critical factors in RHIS performance are environmental and organizational (availability of resources), technical (complexity of the collection tools in their format and procedures for use and complexity of the technologies used) and behavioral (staff motivation and competence associated with RHIS tasks as depicted in figure 1[19].

The project carried out in the out-patient department of Jinella health center is based on this PRISM framework which consists of tools to assess RHIS performance and identified technical, behavioral and organizational factors that affect RHIS.

2.6 PRISM Tools

Four PRISM tools are used to measure RHIS performance, processes and determinants and their relationships described under the PRISM framework.

1. RHIS Performance Diagnostic Tool: The primary component in the toolset, this determines the overall level of RHIS performance, looking separately at quality of data and use of information, to identify weak areas. This diagnostic tool identifies strengths and weaknesses; the other three tools identify the underlying technical, organizational, and behavioral reasons for those strengths and weaknesses.

2. **RHIS Overview and Facility/Office Checklist**: This examines technical determinants such as the structure and design of existing information systems in the health sector, information flows, and interaction between different information systems. This tool is used to understand the availability and status of RHIS resources and procedures used at health offices and facilities.

3. **Organizational and Behavioral Questionnaire**: This looks at behavioral and organizational factors that affect RHIS performance. Do staff members have the necessary knowledge, skills, problem-solving ability, confidence, and motivation? Does the organization promote a culture that values information quality and use? Comparing these factors with RHIS performance identifies gaps and opportunities for improvements.

4. **RHIS Management Assessment Tool**: This is designed to rapidly take stock of the management and supportive practices of RHIS, and to aid in developing recommendations for RHIS management. Measures different RHIS management functions including governance, planning, training, supervision, use of performance improvement tools, and financial resources.

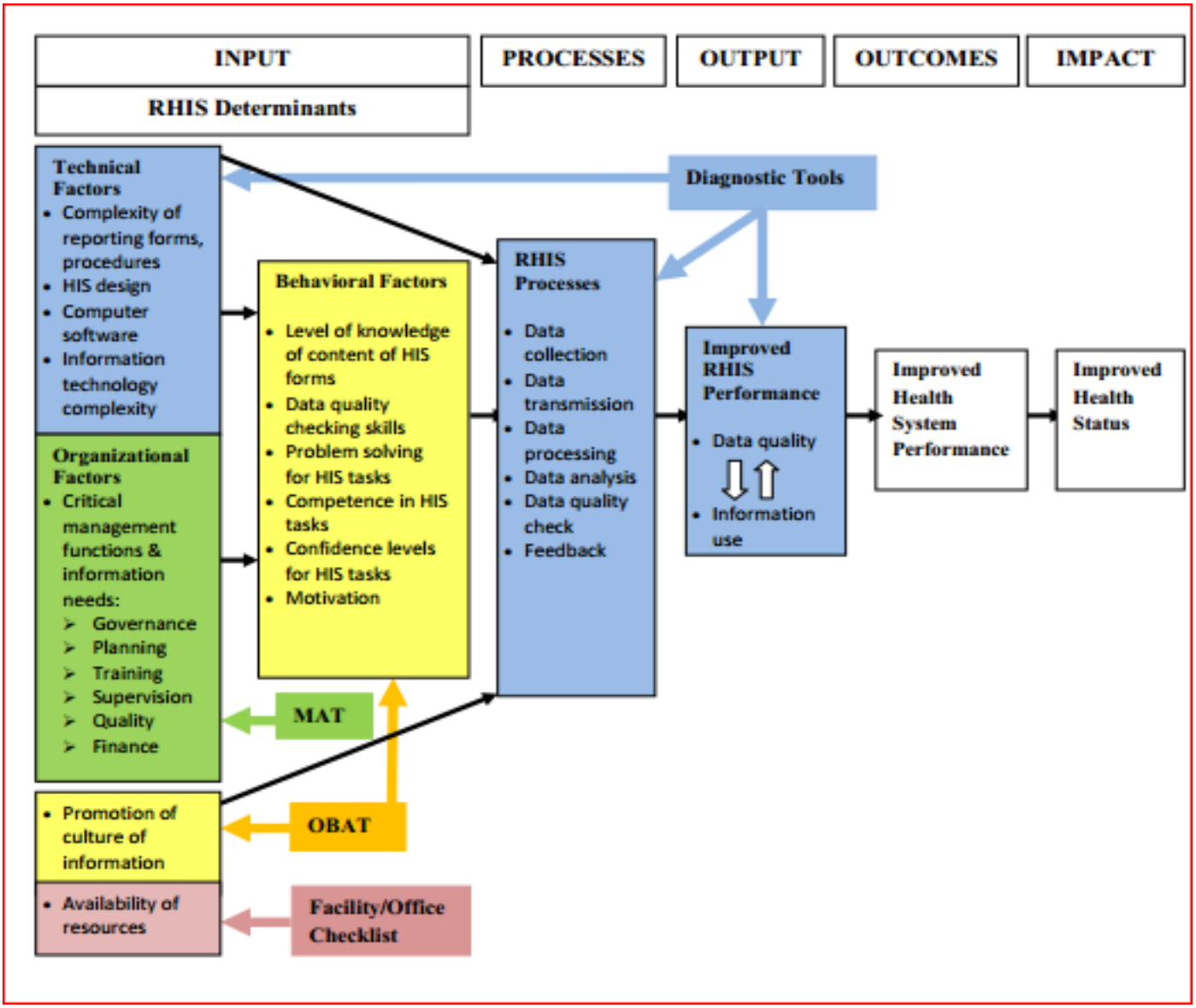

Figure 1: PRISM conceptual framework

Several studies have shown that data quality improved dramatically, because of increased use of quality checks (for timeliness, correctness, consistency and completeness of data) at the facility level, use of computer checks by districts and practical experience gained under supervision during workshops. Problem solving skill, team work, presentation skill, practical computer skill, data analysis and interpretation like competency in using the HMIS, data analysis tools (targets and indicators) became more widely used and understood by information officers and program managers, which strengthened self-assessment and "epidemiological thinking"[20-25].

Using HMIS in KwaZulu-Natal, South Africa, improved from 26% to 64% when carefully assessed before and after implementation of intervention with the same tool [21].

An interventional project conducted From 2008 to 2012, in Cote d'Ivoire also showed an overall improvement in data accuracy, completeness and availability:- Data accuracy at facility level improved from 43 to 60%; Data completeness at facility level improved from 43 to 65% ;Improvements in Use of Information feedback after supervisory visits at facility level from 7 to 29% and also Availability of data summary reports from 12 to 38%. The data-use score at the facility level remained the same 38% [22].

A study conducted on data quality audit for the consistency and quality of immunization monitoring in Kasserine governorate in Tunisia also showed a data use for action [23].

Another quality improvement intervention conducted on community health workers of Neno district, Malawi showed that at baseline, all areas were classified as low data quality. After 8 months, all five areas had achieved high data quality, and the reports generated from electronic database became consistent and plausible [24].

Another cross-sectional descriptive study was conducted to identify the factors associated with poor data quality in the RHIS in Benin .The study finding have shown that A significant link was found between data quality and level of responsibility, sector of employment, RHIS training, level of work engagement and the level of perceived self-efficacy. The focus groups confirmed a positive relationship with organizational factors such as the availability of resources, supervision, and the perceived complexity of the technical factors [25].

Study done on the Assessment of utilization of HMIS done in North Gonder revealed that, out of 84.3% data collected daily, only 22.5% were utilized and 17.7% units of HIV/AIDS changed their data into information at district and facility level and used it for immediate decision making. From the total study units only 13.2% properly document their reports and registration books. In the first quarter of 2006 about 34.7% of the study units were supervised once and 12.2% of them had given feedbacks [17].

A facility based cross sectional study was conducted in Ayder referral and teaching hospital, Mekele, Ethiopia. Data consistency between register and the tally sheets was measured as 72.2% and there was 78.6% average report completeness measure in the HMIS unit. Use of accurate data in the facility was low this could be due to lack of consecutive training to increase awareness and also staffs do not want to spent time in counting data every month even to follow every HMIS disease classification. In addition, information was not still used for action since there was no well established information-use culture in the facility. This might be mostly due to lack of knowledge on how to use HMIS data for allocation of resource and man power and also lack of strict supervision and follow up from the regional health bureau might be another reason [26].

An assessment done on the utilization of health information system at district level in Jimma zone revealed that the overall utilization of information in the study area was about 32.9% In this study it was found that 8(26.7%), 57(31.3%) and 54(36.0%) units/departments of Health Posts, Health Centers and District Offices respectively tried to change data into information, while cumulatively, (32.9%) units/departments of health facilities used their data/information for decision making, planning, budget and M&E of their activities. The study also showed that ***Availability of resources***: 85% of the facilities surveyed have computers, printers and calculators while 40% have regular telephone line and internet. Access to an electricity and water supply is very high (89.2%).The study confirmed that poorly coordinated processes, no capacity building activities on HMIS and absence of supplies like guidelines. Data production, documentation and transfer were not fully supported by information technologies [27].

A cross sectional study was conducted to assess the level of information utilization and identify factors affecting information use in Dire-Dawa administration health facilities, Ethiopia. Over all utilization of health information was found to be 53.1%. Friendly format for reporting and

among behavioral and organizational factors managers provide regular feed back to their staff were found to be significantly associated with health information utilization. Overall HIS utilization was found to be below the national expectation level [28].

2.7 Summary of the chapter

From the above different literature works we have learned a lot and summarized as follow:

The PRISM framework is the first of its kind to empirically test the relationships among technical, behavioral and organizational determinants on HIS process and performance. It creates opportunities to identify whether these determinants act directly or indirectly through behavioral determinants or processes or in interaction with each other to influence RHIS performance.

Without Specific policies, strategies and interventions aimed at improving data quality and use of information produced based on the assessment findings; health systems will never fully be able to meet the needs of the community they serve.

Therefore, the application of the PRISM framework and its tools in various countries has shown that they produce consistent and valid results. While tools exist to assess the quality of facility based data and culture of information use more specifically, the organizational and behavioral assessment can lead to generation of possible interventions for the production of better quality data and for the continuous use of information to improve the quality of health services at Jinella health center.

Chapter Three

3. Methodology

3.1 Study Area

Harari People's National Regional State is one of the nine ethnic based regional states of Ethiopia, covering the homeland of the Harari and surrounding Oromo, Amhara, Gurage,and Tigre people. Formerly named Region 13, its capital is Harar. The Region is located between 9011, 49 $^{(o)}$ and 9024, 24$^{(o)}$ northern longitude and 42003, 30$^{(o)}$ and 42016, 24$^{(o)}$ eastern longitude about 526 KM away from Addis Ababa. The Region also has the smallest land area of the Ethiopian regional states.

Based on the 2007 census conducted by the Central Statistical Agency of Ethiopia (CSA), Harari has a total population of 183,415, of whom 92,316 were men and 91,099 women. This Region is the only one in Ethiopia where the majority of its population lives in urban areas: 99,368 or 54.18% of the population are urban inhabitants. With an estimated area of 311.25 square kilometers the region has an estimated density of 589.05 people per square kilometers. Administratively, the region subdivided in to 9 woreda, further divided in to 19 urban and 17 rural kebeles.

The health facilities within the region include:- Four government hospitals, one armed force hospital, one federal police hospital, two private general hospitals, eight health centers (four in urban and the remaining in rural) one blood bank, one health research & regional laboratory and twenty three health posts. This project was conducted in the out-patient department of in one of the eight health centers.

3.2 Study Design

Both quantitative and qualitative studies with cross-sectional study design were applied. The project used quantitative methods to assess the factors influencing the performance of HMIS in the OPD and qualitative methods to assess data quality and information use by using the adopted performance evaluation tool of the PRISM package.

The study involves data collection before and after the implementation of data quality and information use improvement intervention. Questionnaires and observation guide tool adopted from PRISM tool were used to collect data. Data was measured for its completeness and

accuracy. Similarly, information use culture was observed through a review of report production, meeting minutes, feedbacks, updated displays and other documents that confirm whether and how HMIS data were used in decision-making processes.

3.3 Source and Study Population

The source populations were health professionals of the Jinella health center. The study populations are health professionals who are working in OPD of Jinella health center for least three months, department heads, HMIS Focal person and facility head (key informants). Records of documents: registries, charts, tally sheets, meeting minutes, and other documents were tracked to examine the Department's routine performance monitoring practice.

3.3.1 Inclusion and Exclusions Criteria

Inclusion criteria:- All health professionals or officers who are working in the out-patient department of Jinella health center for at least three months.

Exclusions Criteria:- Health professionals or officers who do not satisfy the above criteria or who were not available during data collection period were excluded from the project.

3.4 Sample Size and Sampling procedure

This project scope was limited only to four OPD departments and the total numbers of the health professionals working in the departments were around 21. All health professionals who were involved in clinical care and HMIS implementation at the health centers were included in the study. Data was collected from all of the OPD staffs (Twenty health professionals for self administered questionnaire and the department head was a part of key informant thus the OPD department head, health center head and HMIS unit staffs were interviewed).

3.5 Data Collection Tools

Health data collection is very important and is the first step taken before any major intervention can be made. As mentioned above, questionnaires with open and closed ended, interviews especially with department heads or unit heads at health facilities and observation of documents, reports, graphs, plans and others were performed. All the data collection tools were adopted from PRISM package. The questionnaires were developed in English language. The interviews and

observations done by principal investigator. All these data collection tools were used in two rounds (before and after intervention) to evaluate the progress.

3.6 Data Entry and Analysis

Data was entered and analyzed using Microsoft Excel. Descriptive statistics was computed for most of the study variables and frequency distribution tables also used to describe some of the findings.

HMIS performance determinants were first categorized as organizational, behavioral and technical factor according to PRISM tool and classified as composite indicators: promotion of information use culture, management function and resource availability for organizational determinant while behavioral determinant was sub-classified as staff motivation and confidence level. For quantitative analysis of organizational (promoting culture of information use) and behavioral (motivation and confidence level) factors likert scale was applied since likert scales are created by calculating or composite score (sum or mean) tools or averages of answers to multiple likert items of each indicator.

During analysis each indicator was first analyzed separately to get its mean and frequency and grouped into their composite form to get mean percentiles for composites and grand composite was done to determine the frequency distribution of the responses which was presented in tabular form.

3.7 Data Quality Assurance

All collected data were checked for completeness, accuracy and consistency by the principal investigator. At the time of data collection, anything which was unclear and ambiguous was corrected by the principal investigator. In addition,

- ✓ The qualitative data collection was conducted by principal investigator.
- ✓ The questionnaires were checked for missing values and inconsistency, completeness and legibility.
- ✓ The data entry and cleaning was made by principal investigator

PRISM performance evaluation tool and self administered organizational and behavioral assessment tool was prepared to assess factors that determine the performance of RHIS. Besides,

observation of daily registers, compiling tools, and reporting formats for data accuracy and completeness were undertaken using adapted PRISM check list.

3.8 Ethical consideration

The project was carried out after getting permission from the ethical clearance committee of Addis Ababa University, Medical Faculty through School of Public Health. Data was collected after getting written permission from Harari Regional Health Bureau.

Information sheet and written consent forms were delivered along with each questionnaire and all the subjects asked if they were willing to participate in the study; and informed verbal consent was obtained from all interviewed subjects. Objective of the study was discussed with each participant and privacy maintained during interview. All the interviews were transcribed with great care and questionnaires are also distributed for all 20 eligible respondents.

3.9 Interventional activities and improved outcomes

The intervention focused on three interrelated domains (technical, behavioral, and organizational) that affect the data quality and information use since no single activity is sufficient to achieve lasting improvements.

3.9.1 Technical interventions

Made Data quality check a priority:-To improve the level of data accuracy and completeness a sub team was formed at OPD level to cross check their counts (blind re-checking) on a tally sheet before submitted to HMIS room. This could be a good entry point to improve use of information. Also Data accuracy assessment form was developed using the principle of LQAS (Lot Quality Assurance Sampling) technique (annex 3).

Use of ICT and Presentation:-Improvements in use of information technology, initiating to use both paper-based and electronic/ICT system, is another broadly implemented HMIS strengthening intervention. Since there were no any use of computer and projector by PMT members' to easily visualize the data. Presentation templates were developed not to miss important indicators. Presentation skills were initially weak, as they were not drawing graphs/tables, limited know-how on technical computer skill (PowerPoint). These skills improved as a result of the intervention.

Figure 3: Monthly review meeting presentation at Jinella health center

3.9.2 Organizational interventions

Strengthening monthly performance review meeting:-It was possible to use monthly performance review meetings as an opportunity to reflect on issue of data quality and use of information. The meetings also provided the opportunity for staff to entertain the available data, review performance, to provide/receive feedback to/from other departments, to acknowledge the best performer and plan for next steps.

Action plan development:- Comprise discussion and preparing action plan for the interventional activities to be performed based on the poor performances achieved then action plans were disseminated to all participants with a specified responsible body and with time bound (annex 5).

Data management:- Proper data management is vital in collecting, aggregating, analyzing, storing, retrieving and reporting of data to measure health program performance. Based on these facts this project made an intervention especially on ensuring quality data collection, storing and retrieving of data. So file boxes were availed and all the available OPD disease reports, service reports, monthly LQAS were labeled and filed (stored) in a file cabinet. These would be a good entry point to maximize information utilization.

Supportive supervision checklist adopted:- supportive supervision checklist was adopted, discussed, approved and printed for use with a focus on ensuring data quality and information use but because of project time constraint the supervision not done yet.

Data were displayed to Promote culture of information use:-Performance against targets/plan were updated and posted on the wall of all OPDs department, HMIS room and health center head office on selected thematic ten major health indicators (table 3). Also improvement on using of data to identify gaps and setting targets as well as to make decisions (under/over reporting) and provide feedback in view of local action-oriented performance monitoring were observed.

Adopt and use of Job aids:- One of the limiting factor of data quality and information use at Jinella health center were improper data recording, writing symptoms of disease rather than the HMIS disease classification, ineligible hand writing and use of abbreviation for disease name. To resolve this a quick reference (job aid) of OPD diagnosis and attendance disease list was adopted, laminated & availed to all OPD benches as a quick reference following this intervention a remarkable improvement were observed on the process of generating quality data (Annex 6).

3.9.3 Behavioral interventions

Creating an information culture is a long-term behavioral intervention. To improve continuous use of information in decision making, individual capacity in core competencies to ensure data quality and use must exist at all levels. The following are some of the actions taken to bridge the observed gap between health workers confidence and competence to perform RHIS tasks:

Promoting feedback mechanisms:- Providing frequent verbal feedbacks at OPD level by co-workers/immediate superiors are viewed as ways of motivating workers to improve data quality.

Training: - Training along with preliminary finding presentation was conducted in the initial phase of the project and all the identified gaps were discussed with the OPD staffs and PMT this approach motivate and maximize the confidence of staffs to improve data quality and information use and. At the beginning and at the end of the training Pre and post test were given in order to evaluate knowledge and awareness of staffs. The post test result showed the knowledge and awareness of staffs were increased on average from 62.5% pre-test to 74.4% post-test. And as an opportunity the Harari regional health bureau in collaboration with Tulane University provided HMIS related training to seven participants.

Mentoring and Coaching:-This approach was used to provide ongoing support to Health workers in the OPD of Jinella health center to address data quality issues (completeness, accuracy), data storage, analysis, presentation and use.

Monthly Data quality checking by the HIT:-The health facilities started to perform data quality checking using the adopted format every month by using LQAS technique. Accordingly the level of data accuracy for the month April was 90% and by the month of May increased to 95% this may be due to the intervention.

Chapter Four

4.1 Discussion of results

The results from this project are presented under different sections. The first section will present description of the project participants. The second provides a description of the HMIS performance baseline data versus post-intervention result as measured by data quality and use of information and a description of the technical, behavioral and organizational determinants of HMIS performance in the OPD. Then the implemented interventional activities aimed to improve HMIS data quality and information use culture during this project has been presented.

4.1.1 Description of project participants

All health professionals in the out-patient department including health facility manager and people working on HMIS in Jinella health center were included in the project. The total number of participants involved were 23 among these participants 20 OPD staffs were involved in self administered questionnaire and the rest three were key informants(health center head, department head and HIT). In addition, registered data and Health facility's HMIS monthly reports were assessed using adopted PRISM toolset to check HMIS data quality and information use practices.

4.1.2 HMIS pre intervention results

Dimensions of the HMIS data quality used in pre-intervention assessment were data accuracy and completeness of HMIS monthly report.

4.1.2.1 HMIS Processes

HMIS Processes were assessed in terms of data collection, data quality check, data transmission, data analysis, data display, feedback and activities for promotion of use of information. The process of checking data quality involves checking for accuracy and completeness.

The routine collection of HMIS data at the health center starts with information collected in the registries at each OPD. Thus, the staffs at each department of health center collect data and send monthly report on paper using tally sheets to HMIS unit. In the HMIS unit all department reports are compiled, aggregated and converted in to electronic form and sent to woreda health office and then to regional health bureau on a monthly basis.

4.1.2.2 Data Quality

For the implementation of this project eight data elements were used of which five were selected from the top ten disease lists posted at the OPD and the rest three were selected from the OPD monthly HMIS report. The reason for the selecting these three data elements were that it better show the level of completeness since the high frequent cases have no chance to be missed during reporting.

At the facility, level including health center, data quality was assessed across the dimensions of data accuracy and completeness. In this project a two dimensions of data quality was used. For pre intervention assessment of this, eight data elements:(a)pneumonia (b) acute febrile illness (c) malaria laboratory confirmed with non P.F (d) malaria laboratory confirmed with P.F (e) Urinary tract infection (f) severe acute malnutrition (g) other or unspecified obstetric condition (h) safe abortion records from 21 July to 20 December/2015 G.C from registers for these data elements were recounted and cross-matched with the figures in the corresponding monthly reports of the health facilities using the adopted PRISM data accuracy checking format.

4.1.2.2.1 Data Accuracy

Data accuracy was measured by comparing the actual monthly reports with the registers for selected data elements during the six months of July to December 2015.The data elements were recounted from the register and compared with the reported value for baseline assessment. The recount was considered as the most accurate figures.

The findings of pre intervention assessment (baseline assessment) of this project was characterized by over and under reporting and showed that overall in about 88.9% cases the data elements in the register properly matched with what was reported with a range in a minimum score of 0 % and maximum score of 166.7%. The result show intervention increased accuracy of data from 88.9% (Table1) to 95.1% (Table 2).

Table 1:Pre-intervention Accuracy and completeness of data during July-December 2015

SN	Data element	July 2015			August 2015			Sept 2015			Oct 2015			Nov 2015			Dec 2015		
		Register	Report	Accuracy (%)	Register	Report	Accuracy (%)	Register	Report	Accuracy	Register	Report	Accuracy (%)	Register	Report	Accuracy (%)	Register	Report	Accuracy (%)
1	Pneumonia	40	47	85.1	24	22	109.1	13	12	108.3	13	16	81.3	15	14	107.1	17	17	100
2	Acute Febrile Illness (AFI)	149	153	97.4	191	204	93.6	180	195	92.3	201	229	87.8	179	198	90.4	146	201	72.6
3	Malaria Lab confirmed with Non P.F	55	79	69.5	101	113	89.4	164	176	93.2	112	125	89.6	111	126	88	92	131	70.2
4	Malaria Lab confirmed with P.F	68	93	73.1	195	204	95.6	180	188	95.7	78	76	102.6	107	110	97.3	68	73	93.2
5	Urinary Tract Infection	164	214	76.6	145	162	89.5	230	247	93.1	161	183	88	130	149	87.2	141	166	84.9
6	Severe Acute Malnutrition	5	3	166.7	3	3	100	5	4	125	1	0	-	1	1	100	3	3	100
7	Other or unspecified obstetric condition	3	-	-	2	3	66.7	6	-	-	2	-	-	5	5	100	1	-	-

8	Safe abortion	0	-	0	0	0	0	0	-	0	0	-	0	1	0	-	0	0	0
Average accuracy =88.9%																			

Table 2:Post-intervention Accuracy and completeness of data April-May2016.

S.N	Data element	April 2016				May 2016			
		Register	Report	Accuracy (%)		Register	Report	Accuracy (%)	
1	Pneumonia	24	22	109.1	Under- report	45	44	102.3	Under-report
2	Acute Febrile Illness	196	188	104.26	Under-report	407	440	92.5	Over report
3	Malaria Lab confirmed with Non P.F	99	96	103.13	Under-report	196	191	102.6	Under-report
4	Malaria Lab confirmed with P.F	188	203	92.61	Over-report	283	299	94.61	Over-report
5	Urinary Tract Infection	231	264	87.5	Over-report	344	373	92.22	Over-report
6	Severe Acute Malnutrition	01	01	100	-	02	0	-	Under-report
7	Other or unspecified obstetric condition	01	01	100	-	0	0	100	-
8	Safe abortion	01	0	-	Under-report	0	0	100	-
	Total	741	775			1277	1347		
	Accuracy by month	95.6%				94.8%			

Average Accuracy= 95.1%

4.1.2.2.1 HMIS report Completeness

In this project completeness is to mean that all the HMIS data elements in a report forms or database are filled. So completeness was measured by number of selected data elements filled against the total number of data elements that the OPD was supposed to fill and examining the number of cells left blank excluding cells with absolute zero value, cells having non monthly reportable data elements and cells corresponding to service that are not given by the department. Therefore, data audit on the HMIS report at Out-patient department from July to December 2015 retrospectively were collected before intervention and found seven blank reportable cells from forty eight possible data element and no blank cells for the month April and May after intervention for system reports. The result show intervention increased completeness of data from 85.4% (table 1) to 100% (table 2).

4.1.2.3 HMIS data analysis and use

The PRISM framework defines use of information employing criteria such as use of information for identifying problems, for considering or making decisions among alternatives, and for advocacy. Based on this definition, a RHIS performance diagnostic tool was developed for measuring RHIS performance.

The use of information were observed through a review of available reports based on HMIS, records of review meeting minutes, feedbacks, updated displays and other documents that confirm whether and how HMIS data were used in decision-making processes in the past six months. The reports were assessed for the availability of any kind of reports (feedback, quarterly, health services etc.), reviewing them for use of information and updated displays. The meeting records were also assessed for discussion on HMIS data quality and findings, the decisions made on the discussions, follow-up actions and referral decisions taken.

4.1.2.3.1 Availability/production of reports

Interviewing of key informants (OPD head, Health center Head and HIT officer), reviews of documents and observation of the overall information system of the department showed that both the manual and electronic system were used for monthly HMIS report. All monthly reports and

registers related to the project period were available in the health center (HMIS room) even though the documentation systems were not well organized. The pre intervention result of the project showed that reports were regularly generated at department level and sent to HMIS unit and then to woreda health office but no feedback was observed either from woreda, health center management or from regional health bureau.

After intervention, a progress have been showed on the availability i.e. information management(proper labeling, compilation and storage,) then all monthly disease report, service report and monthly LQAS/self assessment report were well labeled and stored in a file cabinet and these were supported by providing a file folder. And recommendation was given to the facility head and to regional health bureau for the provision of frequent feedback to the reports.

Figure 2: shows improvement on Information management

4.1.2.3.2 Review of information

Concerning review of information/documents, the regional health bureau and other concerned partners(Centers for disease control and International centers for AIDS program) have a joint supportive supervision plan on a quarterly basis but throughout the nine month the facility was supervised once and they received one feedback report from the expected three supervisions. At the health center the supervision feedback was not reviewed, action plan not developed based on

the challenges reported. Although Supervision is vital to provide adequate support to the health workers and also helps in training and continued improvement by a review of reports (LQAS,disease and service reports) and feedbacks but there was no regular supervision system in place. During interventional period recommendations were given to the Jinella health center PMT about use of information (reviewing information).

To improve the skills and competency of the staff with regard to data interpretation, use of information and evidence-based decision making through regular training program is vital. But the pre-intervention result showed that only one individual was trained in the last six months. Training related to HMIS activities should be conducted regularly but for this specific project purpose a one day workshop was conducted for nine participants during presentation of pre intervention result and discussion on gap identified. As a result, it can be concluded that this management function contributed to the weakness of information use observed in the department. So for this project purpose action plan was developed based on the pre-assessment finding and some of the recommendations forwarded by the regional health bureau in the supervision feedback report that mitigate data quality and information use were incorporated (Annex 5).

4.1.2.3.3 HMIS data display

Display of information either in numeric or graphic format was one of information use parameter measurement used at department levels.

Information collected from interview showed that in the facility there were no plan, chart, table or graph of target displayed at any of the OPDs including in the health center head and HMIS room except some vertical programs like HIV (target vs performance) and very few (only 3) indicators in the emergency OPD. After intervention plans were aligned, performance against targets/plan were updated and posted on the wall of all OPD departments, HMIS room and health center head office on selected major health indicators.

In addition improvement on using of data to identify gaps, setting targets as well as to make decisions and provide feedback in view of local action-oriented performance monitoring were observed. It also used in creating a visual image of the work, demonstrating progress made to compare performance against targets and strengthening transparency and accountability.

Table 3:HMIS Data Displayed in April-May 2016

S.N	Selected indicator	Number of indicators
1	maternal health	05
2	neonatal and child health	10
3	Nutrition	01
4	environmental and hygiene	02
5	TB and leprosy	04
6	HIV/AIDS	05
7	Malaria	02
8	quality of health service	01
9	community participation and engagement	02
10	Improve research and evidence	02
	Total indicators	34

4.1.2.3.4 Record of review meetings

In the health center there were a known performance monitoring team which includes the HMIS unit as a part but there was minimal effort on monthly performance monitoring made by the team. Availability of written records especially meeting minutes were taken as evidence of holding staff meeting. At the facility level meetings were conducted only three times although six meetings were expected (50%) and the meeting records were assessed for discussion on HMIS data quality and findings, the decisions made on the discussions, follow-up actions and referral decisions taken. But the pre-intervention findings showed that no issues raised on HMIS data quality and findings, poor follow up actions and there was no sign of records on referral decisions taken.

After intervention improvements were observed on discussions and recording the agenda of data quality issue, poor performance of some indicators, and action plans were developed based on the comments given during the meeting and the action plans with a defined role and responsibility were distributed to each participant.

4.1.2.4 Determinants of HMIS performance

Emphasize that a particular problem or event may be the result of a particular cause, but quite often many factors come into play to create a particular problem or a desired state. HMIS performance is affected by three categories of determinants; technical, behavioral and organizational determinants (Figure 1). Most inputs of HMIS performance (organizational and behavioral factors) were assessed through Likert scale agreement, ranging from one (strongly disagree) to seven (strongly agree) and their ratings were added together and divided by the total number items and multiplied by one hundred to create an overall percentile score.

4.1.2.4.1 Technical determinants

As defined technical determinants are all the factors that are related to the specialized know-how and technology to develop, manage and improve RHIS processes and performance. Therefore, technical determinants might affect performance directly or through behavioral factors. It also looks at availability & user friendliness of data collection forms, procedures and methods.

The finding showed that, all interviewee's agreed on the user friendliness and comprehensiveness of the forms, procedures and methods. Regarding the availability of ICT equipment, all the departments have computers including HMIS room, and the backup systems were both paper based and electronic using CD and flash disks. The assessments also highlighted few technical challenges like poor HMIS disease identification and classification (STI, malaria), lack of telephone for timely communication, absence of backup generator and frequent stacking of smart-care installed computers. After intervention, improvements on data quality check, proper Disease identification and classification were observed but the newly purchased generator is waiting technicians to be installed.

4.1.2.4.2 Behavioral determinants

To improve continuous use of information in decision making, individual capacity in core competencies to ensure data quality and use must exist at all levels of the health system and using information stimulates evidence-based health care and is an incentive in itself.

The behavioral factors are assumed to be important determinants that affect the various processes and performance of the HMIS. The various behavioral determinants that are assessed using the PRISM framework include knowledge of rationale for collecting various types of data, knowledge in checking data quality, motivation and perceptions of reward. For the consumption of this project behavioral determinants of information use were assessed by level of staff motivation and their self-efficacy or confidence level, where high self-efficacy or confidence levels ensures health workers to complete the task to be done. Positive outcome will increase the probability of performing a task and the output will depend on the confidence and competence of the person. The findings in table 4 shows that the average percentile score of behavioral determinants increased from 55.77% pre-intervention to 72.22% post-intervention.

Table 4: Behavioral determinants before and after intervention

S.N.	Indicator	average percentile score (N=20)	
		Pre	Post
1.	Degree of staff motivation	56.83	64.14
2.	Self efficacy or confidence level	54.71	80.29
	Total	55.77%	72.22%

Self efficacy or confidence level in HMIS tasks

The confidence level of health professional has also a potential in influencing the level of utilization of routine health information in having confidence in the decisions starts with having data that can be trusted. And to have confidence in the data is largely due to its quality. Data quality problem is a major barrier to the usability of data.

The findings of pre-intervention assessment of this project showed that average confidence levels of respondents (health staffs) for checking data accuracy, calculating percentage/rate correctly, plotting data by months/year, computing trends from bar charts, explaining findings and their implications and use of data for identifying gaps, setting targets and making various types of decision and providing feedbacks were 54.71% and 80.29% before and after intervention respectively (table 4). After intervention respondents felt more confidence in calculating, plotting, using of HMIS data and checking HMIS data quality.

Motivation of staffs to accomplish HMIS tasks

As shown in Table 4, the project result showed that respondent's average motivation to perform HMIS tasks were 56.83% before and 64.14% after intervention.

Therefore awareness creation was made during presentation of pre intervention result and discussion on identified gaps with health care provider and the health center performance monitoring team were initiated during the intervention phase to motivate the staff and increase level of management support to create good working environment.

4.1.2.4.3 Organizational determinants

The PRISM framework assumes that if organizations promote a culture of information, they will also improve their competence in conducting HMIS tasks, and thus improving their self-confidence to carry out HMIS tasks. If the work environment does not promote key HMIS attitudes and values, health workers do not internalize the values required to generate, maintain, and improve the information system.

In regard to organizational factors, the pre-intervention assessments highlighted that the absence of empowerment(rewarding for good performance), weak evidence based decision making, low quality of supervision visits, and weak in (management support) emphasizing data quality, seeking/providing feedback from/to affected health workers' to perform HMIS tasks.

4.1.2.4.3.1 Promotion of a culture of information

Any successful organization creates, promotes and sustains a set of core values around which it functions to achieve optimal results. In the context of HMIS, these set of values can be designated as culture of information.

As shown in Table 5, the result of the project showed that the overall staffs at the department believed presence of culture of information (evidence-based decision-making ,management support to the staff, promotion of sense of responsibility and empowerment of the staff for promoting culture of information) were 57.55% before intervention and this was increased to 69.38% after intervention.

Table 5: Promote culture of information before and after intervention April-May 2016.

S.N	Indicator	Percentile score (N=20)	
		Pre	Post
1.	Evidence based decision making	52.15%	65.0%
2.	Extent of management support	60.51%	69.49%
3.	Sense of responsibility	60.97%	71.90%
4.	Empowerment or accountability	56.57%	71.14%
	Total	57.55%	69.38%

Evidence based decision making

As shown in Table 6 the result of the project showed that the average promotion of use of information for evidence based decision making by the staffs were 52.15% before intervention and 65.0% after intervention.

Table 6: Evidence Based Decision-Making before and after intervention April-May 2016

S.N	Indicators	Average percentile scores (%)	
		Pre	Post
1.	Personal preference/favoritism	50.71	54.3
2.	Superior's directives	45.71	46.40

3.	Evidence/facts	58.57	77.86
4.	Political interference	42.14	43.57
5.	Comparing data with set health objectives	52.86	79.28
6.	Actual Health needs	56.43	81.43
7.	Considering costs	58.60	72.14
Total		52.15%	65.0%

Extent of management support

Respondents were asked about their attitude towards the health center management's support such as seeking feedback from concerned /affected staff, emphasizing data quality in monthly reports, discussing conflicts openly to resolve them, using HMIS data for selecting targets and monitoring, checking data quality regularly and providing regular feedback to their staff based on evidence to assess existence of information culture.

Table 7: Extent of Management Support before and after intervention April-May 2016

S.N	Indicators	Average Percentile (%)	
		Pre	Post
1.	Seek feedback from concerned/affected staff	62.14	67.14
2.	Discuss conflicts openly to resolve them	57.86	70.71
3.	Seek feedback from concerned community	69.29	72.86
4.	Emphasize data quality in monthly reports	55.0	60.0
5.	Use HMIS data for setting targets & monitoring	61.43	78.57

6.	Check data quality (validation) regularly	58.57	70.0
7	Provide feedback to staff regularly	59.3	67.14
Total		60.51	69.49%

Sense of responsibility

In order to gauge the general perception of the respondents on the sense of responsibility the respondents were asked to rate the staffs punctuality, Culture of gathering data to find root causes of problem, documenting their activities and keeping records regularly, their commitment to discharge their responsibility, setting appropriate and realistic goals for themselves and feel guiltiness for what they have done.

The pre intervention results of this project showed that 60.97% of respondents believe the staffs were responsible for their work and this was increased to 71.90% after intervention (table 8).

Table 8: Responsibilities of the staffs before and after intervention April-May 2016.

S.N	Indicators	Average percentile (%)	
		Pre	Post
1.	Are Punctual	57.865	68.57%
2.	Can gather data to find the root cause(s) of the problem	53.60%	71.43%
3.	Document their activities and keep records	65.0%	81.43%
4.	Feel committed to discharge their responsibility	64.3%	77.14%
5.	Set appropriate and realistic goals for them selves	72.21%	72.86%
6.	Feel guilty for not accomplishing set goals	52.86%	60.0%
Total		60.97%	71.90%

Empowerment or accountability

The result of this project showed that empowerment of the staffs by the Jinella health center management was 56.57% and 71.14% before intervention and after intervention respectively.

Table 9: Empowerment of staffs by the management before and after intervention April-May 2016

S.N	Indicators	Average percentile (%)	
		Pre	Post
1.	Get rewarded for good work	45.71%	60.0%
2.	Are empowered to make decisions	62.86%	65.0%
3.	Can able to say freely 'NO' to superiors for decisions not supported by evidence	53.57%	76.43%
4.	Are made accountable for poor performance	61.43%	75.71%
5.	Admit mistakes for taking corrective actions?	59.30%	78.57%
Total		56.57%	71.14%

4.1.2.4.3.2 Assessment of Management function

Collecting information by interviewing health center head and through observation during pre intervention showed that there was no clear and one health center level annual plan in management office and there was no internal supportive supervision checklist, there was no internal supervision practice and also no feedback system within the facility to measure their performance and to identify potential problem area. Although conducting an internal audit using standard checklist with in each organization is the cheapest tool to be accredited by national and international organizations. During intervention period the performance monitoring team along with the PM aligned the plan and adopted a checklist to conduct an internal supervision.

4.1.2.4.3.3 Availability of HMIS Resources

Availability of resources is critical as it affects the confidence, motivation and processes involved. Information collected from key informants using structured questionnaire the pre-intervention assessment of this project looked at the availability of resources necessary for better HMIS performance such as calculator at health center, computer, data back-up unit(CD, hard disk, flash diskette),UPS(uninterrupted power supply), any software supporting data collection or analysis, flip charts, markers, printer, ruler and internet connection.

Based on these the health center have sufficient resources except the existence of non-functional UPS and disabled internet connection because of un-paid bill, absence of back-up generator to use smart-care consistently where us printer and telephones are located centrally to all in the health center head bureau. As an intervention, discussion with the management and internet bill was on the process to be paid and the newly purchased generator is waiting the company technicians to install it.

Chapter Five

5. Discussion

Routine Health Management Information System is the backbone for planning and management of the health services at district level and below, and can potentially play an important role in health services improvement and reporting at all levels. Unfortunately, in Jinella health center, routine Health Management Information System (HMIS) was unable to provide the better quality data and information support needed before interventions.

In March 2016, a pre-intervention assessment was carried out to determine the level of data quality and information use in the OPD of Jinella health center. The generated data were of good quality but the produced information was poorly utilized to support local decision making before the improvement interventions. But, after HMIS data quality and information use improvement interventions of this project, proportion of data accuracy has been increased from about 88.9% to 95.1% and the level of data completeness has been increased from 85.4% before to 100% after the intervention and also the pre-intervention data quality was characterized by high data variability (accuracy from 0-166.7%) and values that were often outside reasonable bounds. The post-intervention results shows that data are consistent and within plausible ranges (85%-115%) [18].

The result of the project indicated that data quality in term of its completeness and accuracy was good but having quality data only does not necessarily mean that information is used for decision making rather better understanding of the factors of HMIS performance. Similarly quality improvement intervention conducted on community health workers of Neno district, Malawi showed that at baseline, all areas were classified as low data quality. After 8 months routine supervision and data quality check support, all five areas had achieved high data quality, and the reports generated from electronic database became consistent and plausible [24]. Another study conducted in Ayder referral hospital revealed that data consistency between register and the tally sheets was measured as 72.2% and there was 78.6% an average report completeness measure in the HMIS unit. There was no sign of using the information generated by the facility [26]. Interventional study conducted on PMTCT data quality in KwaZulu-Natal, South Africa, showed that overall data completeness improved from 26% to 64% and accuracy of data from 37% to 65% before and after the intervention and the data quality improvement interventions included

three main components: training on data collection, monthly reviews of data and data audits at individual facilities [21].

This project assessed use of information which is another dimension of HMIS performance and found to be low in the assessed department: Absence of integrated plan and continuous training, lack of supportive supervision, low management support, lack of recognition and feedback were the contributing factors for the observed minimum use of HMIS information in the department.

As other part of interventional activities of this project, plans were aligned, training was provided and data audit and performance review meeting was conducted with active participation of performance monitoring Team. In such away evidence based decision making was promoted, staffs were motivated by recognizing their better performance. This in turn increased the confidence and responsibility of the staffs for their future continuous work toward ensuring and sustaining HMIS data quality and information use practice to locally monitor performance of service delivery. Evidence from the various PRISM assessments revealed that availability of quality data or information does not necessarily mean that information is used for making decisions. For instance, the observed positive change in data quality in Cote d'Ivoire is not accompanied with improvement in use of information at the point of data collection. The interventions to strengthen the use of health data in decision making that Cote d'Ivoire used consists of: Assess and improve the data-use context, engage data users and data producers, improve data availability, identify information needs, build capacity in data-use core competencies, strengthen the organization's data-use infrastructure, monitor and evaluate data-use interventions but use of information in Cote d'Ivoire remained at 38% between 2008 and 2012 at health facility level [22].

An assessment done on the utilization of health information system at district level in Jimma zone revealed that the overall utilization of information in the study area was about 32.9% [27]. It was assumed that culture of information use affect staff's self-efficacy level for HMIS tasks.

The study conducted in North Gondar, showed that out of 45 HIV/AIDS units only 17.7% changed their data into information at District and facility level, and used for immediate decision making which indicates that utilization of health information was very below [17]. On the other hand this finding could be strengthened by the report of progress and lessons on

HMIS/M&E implementation from pioneer regions (including Dire Dawa) showed that health facilities implementing the new HMIS and M&E achieved considerably high improvements in data quality, information management, and reporting and information use [11].

Overall, this project result showed that high and increasing completeness, internal consistency (accuracy) and information use culture of Jinella health center. The improvement is likely attributable to interventions based on the identified technical, behavioral and organizational determinants implemented to improve data quality and information use.

Chapter Six

6. Conclusion and recommendation

6.1 Conclusion

This project was conducted on the aim of improving data quality and information use in the Out-patient department by assessing the weakness and strengths of HMIS performance using the PRISM tool and its major barriers grouped under technical, behavioral, and organizational factors and it come up with interventions intended to address the identified problems in the out-patient department of Jinella health center.

The high levels of accuracy, completeness and low level use of information found in this project are consistent with low levels of motivation, confidence, promotion of culture of information, training, supervision and feedback which needs to be improved.

The practical, scalable and simple interventional activities of this project on HMIS data quality and information use practice improved the accuracy and completeness of HMIS data that smoothed the way for continuous information use in Jinella health center. The HMIS data quality and information use improvement interventions that involved : training, mentoring and coaching, data audits, use of job aids, use of ICT tools, displaying data, as well as performance review meeting was found to be effective in increasing the accuracy, completeness and information use.

Moreover, lack of staff motivation mechanism for information use and lack of recognition systems for well-done job at place of work are the behavioral factors that influence information use in the OPD of Jinella health center. When the organization fails to provide staffs with incentives to motivate them collect data and use information, it compromises the quality of data collection and the use of the information.

Therefore, management support, Capacity building of the facility management members and all staff at health facilities that collect data ,record, process and complete monthly reporting has been recognized as vital in addressing challenges of data quality and information use in Jinella health center.

6.2 Recommendation

Based on the findings of the project, the following recommendations were made to Jinella health center and concerned bodies:-

- ✓ Scalable, Innovative and cost effective interventions should be used to motivate the health workers to improve data quality and information use at Jinella health center.
- ✓ Development and use of data quality standards and operating procedures by Jinella health center PMT.
- ✓ Strengthening and adhering with the electronic /Electronic Medical Record system/
- ✓ Continued and improved use of ICT to strengthen data availability, quality, analysis, and use
- ✓ Training and technical assistance by the Harari regional health bureau and partners should be deployed to improve competency in documentation of health services, analysis, data use, data quality improvement, and reporting. Continuous mentoring and coaching goes hand in hand with training health workers in using the data to make decisions and to improve data quality.
- ✓ The Jinella health center management members should install the newly procured generator for the consistent use of smart-care.
- ✓ Strengthening and conducting an internal supervision since it is the simplest method to improve facility level data quality and information use culture

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Annexes

Annex One: Organizational and Behavioral Assessment Questionnaire

Dear respondent,

This questionnaire is designed to collect data for a project entitled "Improving Data Quality and Information Use in Out Patient department: The Case of Jinella health center. The objective of the project is to improve data quality and information use at Jinella Health center,Harari Region. In the facility, all individuals whose works involve providing health activities (health professionals) are selected. And you are selected just because of your position. Even though this project is conducted for the partial fulfillment of master program in health informatics, it is believed to contribute much for the understanding of data quality and the current information utilization pattern and to identify the factors contributing to the existing situations. This in turn is hoped to give insight as to how to improve the HMIS use in the facilities . Your participation in this study does not involve any direct risk or benefit for you but it is very useful since your answers, and those of other participants will help to improve the problem related to HMIS data quality and information use in OPD Department.

CONTACT NAME: DEREJE FELEKE

Tel: 251-911-96-81-15

E-mail:dereecho16@yahoo.com

Part One: Background Information

1.Name of your Facility/organisation _____

2.Your age, ____ Sex, _____ Year of experience,_____

3. Level of Education _____

4.your position in the department _____

5.Did you receive any training in HMIS related activities in last six months? 1. Yes 0. No

To what extent, do you agree with the following on a scale 1-7?

(Please select one answer and encircle the corresponding number)

About yourself

Questions	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat Agree	Agree	Strongly agree
Personal: (Motivation)							
6. Collecting information which is not used for decision making discourages me	1	2	3	4	5	6	7
7. Collecting information is appreciated by co-workers and superiors	1	2	3	4	5	6	7
8. Collecting information bores me	1	2	3	4	5	6	7
9. Collecting information is meaningful to me	1	2	3	4	5	6	7
10. While recording data am contributing to the monitoring of heath service delivery performance	1	2	3	4	5	6	7
11. Collecting information is forced on me.	1	2	3	4	5	6	7
12. Data collection is a burden! am busy with my job	1	2	3	4	5	6	7
Rate your confidence in accomplishing the following activities:							
13. I can check data accuracy	1	2	3	4	5	6	7

14.I can calculate percentages/rates correctly	1	2	3	4	5	6	7
15.I can plot data by months or year	1	2	3	4	5	6	7
16.I can compute trends from bar charts	1	2	3	4	5	6	7
17.I can explain findings & their implications	1	2	3	4	5	6	7
18.I can use data for identifying gaps and setting targets	1	2	3	4	5	6	7
19.I can use data for making various types of decisions and providing feedback	1	2	3	4	5	6	7

About your department staff and management members

Questions	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	agree	Strongly agree
In your Department, decisions are based on:							
21. Personal liking/preference	1	2	3	4	5	6	7
22. Superior's directives	1	2	3	4	5	6	7
23. Evidence/facts	1	2	3	4	5	6	7
24. Political interference	1	2	3	4	5	6	7
25. Comparing data with set health objectives	1	2	3	4	5	6	7
26.Actual Health needs	1	2	3	4	5	6	7
27.Considering costs	1	2	3	4	5	6	7
Are management members:(Management support)							
28.Seek feedback from concerned/affected staff	1	2	3	4	5	6	7
29.Emphasize data quality in monthly reports	1	2	3	4	5	6	7
30.Discuss conflicts openly to resolve them	1	2	3	4	5	6	7

31. Seek feedback from concerned community	1	2	3	4	5	6	7
32.Use HMIS data for setting targets & monitoring	1	2	3	4	5	6	7
33.Check data quality (validation) regularly	1	2	3	4	5	6	7
34.Provide feedback to staff regularly	1	2	3	4	5	6	7
In your department , the staffs:(Sense of responsibility)							
35. Are Punctual	1	2	3	4	5	6	7
36.Can gather data to find the root cause(s) of the problem	1	2	3	4	5	6	7
37.Document their activities and keep records	1	2	3	4	5	6	7
38. Feel committed to discharge their responsibility	1	2	3	4	5	6	7
39. Set appropriate and realistic goals for them selves	1	2	3	4	5	6	7
40. Feel guilty for not accomplishing set goals	1	2	3	4	5	6	7
In your department the staffs (Empowerment)							
41. Get rewarded for good work	1	2	3	4	5	6	7
42. Are empowered to make decisions	1	2	3	4	5	6	7
43. Can able to say freely 'NO' to superiors for decisions not supported by evidence	1	2	3	4	5	6	7
44. Are made accountable for poor performance	1	2	3	4	5	6	7
45. Admit mistakes for taking corrective actions?	1	2	3	4	5	6	7

Annex Two: Data Quality and Information Use Structured Interview

This questionnaire is designed to collect data for a project entitled "Improving Data Quality and Information Use in OPD department: The Case of Jinella health center. I kindly request your participation to response to this interview because your participation is very important for the realization of this project. Please be sure that all the information provided in the interview will be used for the project purpose only and treated with at most confidentiality, you are not obliged to answer any question that you do not want to answer. Your participation in this project does not involve any direct risk or benefit for you but it is very useful since your answers, and those of other participants will help to improve the problem related to HMIS data quality and information use in OPD department.

Name and Title of person(s) Interviewed: _____

I. Quality of Data (Department head only)

Data Recording

1. Does your Dep't keep separate record of HMIS related data? 1. Yes 0. No

2. Does your Dep't keep soft or hard copy of HMIS monthly reports sent to higher level (HMIS unit)? 1. Yes 0. No

3. If 'Yes' to above, Count the number of HMIS monthly reports kept at the Dep't for the past six month in 2008 (Hamle – Tahsas), HMIS _____

Data Completeness

4. What is the number of data elements in the HMIS monthly report that has to be reported? *(NB: see copy of HMIS report* Hamle – Tahsas*)* ----------

5. Count the number of data items that are supposed to be filled by this Dep't but left blank without indicating "0" in the from Hamle 2007 to Tahsas 2008 reports.

5.1 Hamle 2007 HMIS ----------

5.2 Nehase 2007 HMIS ----------

5.3 Meskerem 2008 HMIS ----------

5.4 Tikimit 2008 HMIS----------

5.5 Hidar 2008 HMIS----------

5.6 Tahsas 2008 HMIS----------

Data Processes/Analysis (Only HMIS unit)

6.0 During the previous two quarter of EFY 2008

6.1. Does the Unit office keep copies of HMIS monthly reports sent by OPD?

1. Yes, observed 0. No

6.2. Count the number of monthly reports submitted by the OPD for six months ----------

6.3 Does the Unit Office record receipt dates of the HMIS monthly report? 1 Yes observed 0 No

6.4. Does the Unit Office have a record of people who receive monthly report data by a certain deadline after receiving monthly reports from the Department? 1. Yes, observed 0 No

II Use of Information

Guidelines

1. Does your Dep't have the following manuals? (Hard or soft copy)

1.1 HMIS Indicator definition 1. Yes, observed 0. No

1.2 HMIS Disease classification 1. Yes, observed 0. No

1.3 HMIS information use guide 1. Yes, observed 0. No

HMIS Report Production

2. Does your Dep't produce HIS related report? 1. Yes 0. No

3. Did the Dep't receive any feedback on the report they deliver to higher level (HMIS unit), for the last half year? 1. Yes, observed 0. No

4. If 'YES' to the above question observe the report and write the summary concept. _____

Display of information

5. Does your Dep't has performance monitoring display (graph, Table, Chart, Map, other)?

1. Yes, observed 0. No

6. Please, write types of data displayed and whether the data are updated for EFY 2008, 1st and 2nd quarters (Hamle – Tahsas)

	Type of data displayed	1.Type of display (Please circle)	2. Updated		Remark
1	Plan Vs Performance showing display	Table	1.Yes	0.No	
		Graph/Chart	1.Yes	0.No	
2	Other service provision showing display (Write if any) _____	Table	1.Yes	0.No	
		Graph/Chart	1.Yes	0.No	

Performance Review

7. Does your Dep't have performance review meetings? 1. Yes 0. No

8. How frequently are the performance review meetings supposed to take place?

0. No schedule 1. Quarterly 2. Monthly 3. Every two weeks 4. Weekly

9. How many times did the performance review meetings take place during 1st and 2 nd quarters (Hamle – Tahsas) of EFY 2008?

0. None 1. One times 2. Two times 3. Three times 4. More than three times

10. Are minutes of performance review meetings maintained? 1. Yes, observed 0. No

11. If 'Yes' to above question, observe the minutes from Hamle – Tahsas, and insure if there is:

11.1 Discussions on data quality, reporting, information use or others? 1. Yes 0. No

11.2. HMIS related issues/problems referred to higher level for actions? 1. Yes 0. No

11.3. Any decisions made based on the discussions of HMIS related Issues? 1. Yes 0. No

11.4. Follow-up actions taken on the decisions made? 1. Yes 0. No

11.5. Discussions, on the performance of the department? 1. Yes 0. No

11.6. Any decisions made based on the discussion of the department performance? 1. Yes 0. No

Facility/Office Checklist

12. Fill the following information technology related questions.

S.N	Items	Total	Remark (status)
1	Computer		
2	Data back-up unit (CD,Hard disk, USB, etc)	1. Yes 0. No	
3	Internet or Modems (CDMA, EVDO)		
4	UPS		
5	Any Software supporting data collection or analysis (write if any)		
6	Telephone		
7	Calculator		
8	Stationeries (marker, flip chart, ruler, etc)		
9	Printer		
10	Others(specify)		

13. Availability of forms and other resource

13.1 Do you have HMIS reporting forms? 2. Yes 1. Yes, but not enough 0. No

13.2 Does the department have enough Registries and Tally sheets? 1. Yes 0. No

13.3 Do you have HMIS focal person? 1. Yes 0. No

13.4 Are reporting forms are easy to use and have enough space to record data? 1. Yes 0. No

13.5 Explain any other issues _____

Management Assessment Tool *(MAT)*

14. Presence of HMIS plan with targets at health center level 1. Yes 0. No

15. Presence of individual plan and performance appraisal 1. Yes 0. No

16. Presence of internal supervision schedule and checklist 1. Yes 0. No

17. Presence of internal supervisory reports and feedbacks 1. Yes 0. No

Annex Three: Observation guide and Data Audit Tool

A. Observation guide

1. Assess the overall data collection, processing and usage?
2. Assess the availability of data collecting tools
3. How and who compiles and records data
4. Is there an operational HMIS computer?
5. Assess Presence of Guiding documents in the department
6. Are there records of meeting minutes? Does it include HMIS related activity?
7. Is there performance review and planning exercise?

B. Data Accuracy Check (Data audit)

8. Find the following information for the six months in the register retrospectively. Compare the figures with the health center monthly reports. If there is no register put NA (not applicable).

SN	Data element	July 2015			August 2015			Sept 2015			Oct 2015			Nov 2015			Dec 2015		
		Register	Report	Accuracy (%)	Register	Report	Accuracy (%)	Register	Report	Accuracy	Register	Report	Accuracy (%)	Register	Report	Accuracy (%)	Register	Report	Accuracy (%)
1	Pneumonia																		
2	Acute Febrile Illness (AFI)																		
3	Malaria Lab confirmed with Non P.F																		
4	Malaria Lab confirmed with P.F																		

5	Urinary Tract Infection (UTI)																		
6	Severe Acute Malnutrition																		
7	Other or unspecified obstetric condition																		
8	Safe abortion																		

Annex Four : Pre/ Post test about the benefits of Data quality and Information use

The questions were presented to assess the knowledge and attitude of health professionals towards data quality and information use and their benefits.

Choose the best answer from the given alternatives and circle your choice. Please write your code on the space provided

Code----------

1. Health Management Information System (HMIS):

A. Collects data from service records and administrative records

B. Provides signals that can be reviewed frequently to monitor program implementation

C. Used for decision making D. A and B E. All of the above

2. Why do we need information?

A. To make policy and management decisions B. For Monitoring and Evaluation

C. For Project management D. A and B E. All of the above

3. Decision making is a process that requires

A. Quality data B. Availability of resources

C. A and B D. None

4. One of the following is source for routine information

A. Census B. HMIS C. Vital registration system D. Demographic Survey

5. Which factors affect HMIS data quality and information use?

A. Organizational B. Behavioral C. Technical D. All of the above

6. Data Quality refers to

A. Relevance, completeness, timeliness and accuracy of the data

B. Timeliness and accuracy of the monthly reports

C. Timeliness, completeness and accuracy of monthly reports D. None of the above

7. Data refers to factual figures/information recorded on the registers; and Information refers to the data that have been aggregated and reported.

A. True B. False

8. A variable that permits to measure a change of a given condition over time is called

A. Baseline B. Target C. Indicator D. Data E. All of the above

9. Which statement is true about the PRISM Tools?

A. RHIS Diagnostic Tool is used to assess problems in RHIS/HMIS data management

B. PRISM Tools are used to analyze HMIS information for decision making

C. Organizational & Behavioral questionnaire helps to determine the level of confidence in performing HMIS tasks D. None of the above

10. Evidence-based decision making - is a process by which public health decisions are informed by using data transparently.

A. True B. False

11. Which one of the following is an example of culture of information use?

A. Regular meeting of the Health Unit's Management Team

B. Timely submission of accurate and complete HMIS monthly reports

C. HMIS Focal Person regularly cross-checking data accuracy

D. Documentation of data review and use by decision makers

12. Good information flow means:

A. HMIS reports are submitted at timely and regular intervals to the regional health bureau

B. Information is shared within a health unit and between the upper and lower health units

C. Regular feedback is provided by the upper administrative health units to their respective lower levels D. All

13. One of the following need data to make evidence based decisions

A. Computer data entry person B. Health professionals

C. Director of Medical Services Directorate D. Program managers E. All of the above

14. Completeness of data is defined as

A. All the data elements in a database or report are filled

B. Percentage of HMIS reports that are received on time out of the expected number of reports for an administrative unit

C. data that is compiled in databases and reporting forms is accurate and reflect no inconsistency between what is in the registers and what is in the databases/reporting forms at facility level

D. Consistency of data in the reporting forms and the computer files

15. Factors that affect value of information include:

A. Appropriateness B. Quality C. Timeliness D. Quantity E. All

16. Information management include:

A. Data collection B. Data processing C. Data analyzing D. b and c E. All of the above

17. Information used in HMIS is merely to collect and to report to higher level

a. True b. False

18. Both health managers and health staff should have skills in interpreting HMIS information and problem solving a. True b. False

19. Which factors help to sustain a culture of information use?

a. Leadership b. Policy statement on information use

c. Skills to analyze and interpret data d. Availability of HMIS resources

e. a. and c. of the above

20. You can present data using

a. Charts and graphs b. Charts, graphs and tables

c. Charts, tables, and/or statements d. Percentages, aggregated numbers, diagrams

ADOPTED FROM;-Facilitator's Manual: HMIS Procedures training for Public and Private health facilities, Mar, 2014

Annex Five : Action plan

Health Facility Name-Jinela health center

Title- Action Plan for Improvement Project on Data Quality & information use

Duration - From April to May/2016

S. N	Gap identified	Reasons for identified gaps	Possible solution (Interventions)	Major Deliverables	Respon sible body	Time frame	Status
1.	Lack of training	Some of the staffs were new for the Health center -some of them trained years ago	-Presentation of the project pre intervention results and discussion on the identified gaps (short term) -Discussion on the action plans	Reach in consensus on the identified gaps and action plans to be done	PM	one day	Done
			-conduct trainings and capacity building workshops(Behavioral) in collaboration with regional M &E directorate	Trained human resource for accomplishing routine HMIS tasks	PM and M & E team of RHB	6 days training for 7 staffs were given	
2	Weak culture of information use	-Limited understandin g on the determinants of poor	-Evidence based decision making, -promote through the regular PMT monthly meeting	-produce better quality data and continuous information use	Woreda Ho and PMT	Every time	Ongoin g

		performance	- Emphasis on data quality -promoting sense of responsibility(Root cause analysis for over/under report, feel guiltiness for non conformity)				
			-comparison of the data over months/quarters -promote use of table, chart or graphic tools on core indicators for data display -Get reward for good work	-use of table, chart or graphic tools on core indicators at each OPD, Health center Head office &HMIS room	PM	One month	Done
3	Over/under reporting	-Poor supervision -No DQC and –No feedback system	-DQC form preparation & distribution -Data audit -Monthly review meeting -strengthening Supervision	- Prepared DQC form -Adhere monthly review meeting with HMIS agenda	PM and PMT	one month	Partial
4	Weak performance monitoring system	Poor supervision and feedback mechanism	Weekly/Monthly review meeting	-Strengthened supervision and feedback	PMT	1month	Done
5	No internal	Poor	Develop/Adopt supervisory	Adopted	PMT &	Two	done

	supervisory check list	supervision	check list	supervisory check list	PM	week	
6	Absence of internal supervision	Awareness/Exercise	-Awareness creation and Exercise	Conduct internal supervision	PM & PMT	Monthly	Ongoing
7	Absence of rewarding system for good performance	Lack of awareness	Reward health workers that demonstrate good performance	Informed Management team on the impact of rewarding system on HMIS	PM & PMT	1 month	Done
8	DQC system By HIT & external supervisors	-Time taking	-DQC by the HIT, M & E team of RHB during supervision	-Providing compiled report of the assessment with Recommendation	PM & M & E team of RHB	Recommendation to RHB	Recommended
9	Absence of HMIS classification job aid in OPD	Shortage	- Develop job aid, print and avail	Having laminated HMIS Job Aid in four OPDs	PM	3 days	Done

10	Not using proper HMIS disease classification in the register	-Absence of Awareness	-Availing HMIS disease classification guideline to OPD -Mentoring & coaching	-Proper HMIS disease classification utilization	PM & HIT	1month	Done
12	Illegible hand writing & use of abbreviations in HMIS disease classification	-Awareness and Negligence	-Orientation - Mentoring & coaching	legible handwriting and use of expanded form of words in the registers	PM	1month	Done
13	Poor document management	- Absence of Awareness - No File box	- Mentoring & coaching - Avail file box	-Proper documentation	PM	2 week	Done

RHB-Regional health bureau **PMT**-Performance monitoring team **PM**-Project manager

HC-Health center **DQC**-Data quality check **ASAP**-As soon as possible

M & E –Monitoring and Evaluation team

HIT – Health information technology

Annex Six: Job-Aid of OPD diagnosis and attendance disease list

1	Admitted patients
2	Malaria (Clinical,no lab confirmed)
3	Malaria (lab confirmed, P.falciparum)
4	Malaria (lab confirmed, non P.falciparum)
5	Diarrhea(non bloody)
6	Diarrhea with dehydration
7	Diarrhea with blood(dysentery)
8	Meningitis
9	Typhoid fever
10	Relapsing fever
11	Epidemic typhus
12	Acute Febrile Illness
13	Poliomyelitis/Acute flaccid paralysis
14	Measles
15	Pleague
16	Cholera
17	Yellow Fever
18	Dracunculiasis
19	Neonatal Tetanus
20	Viral Hemorrhagic Fevers
21	Avian Human Influenza
22	Rift Valley Fever
23	Human Immunodeficiency Virus/HIV

24	AIDS
25	Tuberculosis-all forms
26	Leprosy
27	Pneumonia
28	Sexually Transmitted Infections: Urethral Discharge
29	Sexually Transmitted Infections: Persistent/Recurrent Urethral Discharge
30	Sexually Transmitted Infections: Genital Ulcer
31	Sexually Transmitted Infections: Vaginal Discharge Syndrome
32	Sexually Transmitted Infections: lower abdominal pain syndrome(pelvic inflammatory disease-PID
33	Sexually Transmitted Infections: Scrotal swelling syndrome
34	Sexually Transmitted Infections: Inguinal bubo swelling(Swelling glands)
35	Sexually Transmitted Infections: Neonatal conjunctivitis
36	Sexually Transmitted Infections: Neonatal herpes
37	Leshmaniasis(Visceral)
38	Leshmaniasis(cutaneous and mucocutaneous)
39	Onchocerciasis
40	Diphteria
41	Pertusis
42	Tetanus(other than neonatal tetanus)
43	Trypanasomiasis
44	Schistosomiasis
45	Trachoma
46	Viral Hepatitis

47	Rabies
48	Helminthiasis
49	Other or Unspec. Infectious and parasitic disorder
50	Neoplasm
51	Anemia
52	Other or Unsec. Disease of the blood
53	Diabetes Mellitus
54	Iodine-deficiency-related goiter
55	Moderate Acute Malnutrition
56	Sever Acute Malnutrition
57	Other or Unspec. End nut., and metabolic disease
58	Mental and Behavioral Disorder
59	Epilepsy
60	Other or Unsec. Disease of the nervous system
61	Cataract
62	Glaucoma
63	Other or Unsec. Disease of the eye and adnexa
64	Otitis
65	Other or Unsec. Disease of the ear and mast. proc.
66	Hypertension and related disease
67	Other or Unsec. Disease of the circulatory system
68	Acute upper respiratory tract infection
69	Acute bronchitis
70	Asthma

71	Chronic Obstructive Pulmonary Disease (COPD)
72	Other or Unsec. Disease of the Respiratory System
73	Dental and Gum disease
74	Dyspepsia
75	Other or Unsec. Disease of the Digestive system
76	Infections of the skin and subcutaneous tissue
77	Other or Unsec. Disease of the skin and subcutaneous tissue
78	Disease of the Musculoskeletal system and connective tissue
79	Urinary Tract Infections
80	Other or Unsec. Disorders of the genitourinary system
81	Medical Abortion without complication (Safe Abortion)
82	Cause of Abnormal Pregnancy child birth and Puerperium
83	Other or Unspec.Obstetric Conditions
	Perinatal Condition
84	Certain Condition origin.in the perinatal period
85	Congenital malform.,deform and chrom abnorm.
86	Trauma(Injury,fracture etc)
87	Burns and corrosions
88	Poisoning
89	Other or Unspec. Effects of External causes
90	Road traffic injuries
91	Violence and intentional injury
92	Other or Unspec.External causes of morbidity and mortality
93	Contact with health services,including visits for examination and investigations

94	District/region specific disease-1
95	District/region specific disease-2
96	Other unspec. diseases