Addis Ababa University

School of Information Science and

School of Public Health

Master of Science in Health Informatics

Project Work:

Health Management Information System data quality and information usage improvement project: Case of Begi District

By

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DECLARATION

By my signature below, I declare and confirm as this project is my original work. I have followed all the ethical principles of scholarship during the baseline assessment, implementing interventions and reviewing post interventions improvements of this project. All scholarly concepts and thoughts included in this project work have been given recognition through its citation. 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. I seriously declare that this project work has not been submitted to any other institution anywhere for the award of any academic degree, diploma and certificate.

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ANC	Antenatal Care
BPR	Business Process Re-engineering
CHIS	Community Health Information System
EECMY	Ethiopian Evangelical Church Mekana Yesus
FMOH	Federal Ministry of Health
GOE	Government of Ethiopia
HC	Health Center
HEWs	Health Extension Workers
HIS	Health Information System
HMIS	Health Management Information System
HMIS/M&E	Health Management Information System/Monitoring
HMN	Health Matrix Network
HSDP	Health Sector Development Program
HIS	Health Information System
MAT	Management Assessment Tool
MDG	Millennium Development Goal
MCH	Maternal and Child Health
OBAT	Organizational and Behavioral Assessment Tool
PM	Project Manager
PMT	Performance Monitoring Team

PMTCT	Prevention of Mather to Child Transmission
PRISM	Performance of Routine Information System Management
RHIS	Routine Health Information System
SNNPR	Southern Nation Nationalities and Peoples Region
WHO	World Health Organization
WorHO	Woreda Health Office

ABSTRACT

Introduction: Better performed Health Management Information System (HMIS) is most frequently cited as critical for evidence-based decision making and effective targeting of interventions to those in greatest need at each level of health system. However, in Ethiopia, data quality and information use for evidence-based decision making remain weak within health sector, especially at peripheral level of woreda and health facility which have primary responsibility for operational management under the woreda decentralization process begun in 2002 GC.

Objective: Creating a baseline for HMIS performance and its determinants to formulate and implement possible interventions and review post interventions changes in view of improving HMIS data quality and information use in Beghi District

Methodology: A facility based cross- sectional descriptive study design was used for the baseline assessment of HMIS Performance by gauging it in terms of data quality and continuous use of information as well as to place the routine HMIS performance in a context of its technical, behavioral and organizational determinants to formulate, take possible actions and review Post interventions.

Result: The result of the project showed that proportion of HMIS data accuracy has been increased from about 65% before to 87% after interventions. Similarly, level of HMIS data completeness has been increased from about 42% before to 100% after intervention. In addition, the project paved way for culture of information use promotion as well as addressing behavioral determinants of HMIS performance within Begi District. Poor management support, lack of effective supportive supervision and feedback provision focusing on HMIS data quality and information use practice were identified as contributing factors for poor HMIS data quality and information use practice in Begi District.

Conclusion: For improving HMIS data quality and information use practice in local action-oriented performance monitoring; simple, strategic and practical interventional activities were carried out throughout the project. As a result, the encouraging improvement were achieved in terms of increasing proportion of data accuracy, completeness and timeliness of monthly HMIS reporting as well as on information use practice for identifying gaps, setting targets, making decisions and give feedback in internal health management for Begi District case.

Recommendation: Further research for analyzing cost and effectiveness of similar interventions as well as to see association between better performed HMIS process and improved performance of health service delivery.

CHAPTER ONE: INTRODUCTION

The introduction section highlights a backdrop of the project work. It provides a background on data quality and information practice particularly for health decision making. It then highlights the statement of the problem for this project. It also shows the general and specific objectives followed by the scope, limitation and significance of the project.

1.1 Background

An organization becomes effective and efficient by bringing and managing resources together in productive way. The traditional lists of resource comprise human, financial and material resources. Only since past few decades that information becomes other resources believed to be an indispensable for effective management (1). Since 1987, world health organization (WHO) reports clearly links improved health management to better performed health management information systems: Of the major obstacles to effective health management, information support is the one most frequently cited. For information to influence health management in an optimal way, it has to be used by decision-makers at each point of the management spiral including situational analysis, priority setting, implementing and evaluating programmed activities (2).

Improving evidence-based decision making by harmonization and alignment is one of the ten strategic objectives [SO] of HSDP-IV. That is to support improved evidence-based decision making particularly at peripheral level of woreda and facility. It has been enhanced through partnership, harmonization and alignment, including integration of health projects and programmes at the point of health service delivery whose expected outcomes are proper generation and use of evidence (better quality data and continuous information use) at all levels of the health system. The aim of this strategic objective of HSDP-IV is to respond to critical health problems of the community; to realize the one-plan, one-budget and one-report approach; and to effectively integrate and align health programmes and projects. In order to achieve this objective, Better HMIS performance producing better quality data and continuous information usage has been identified as critical since it leads to improved performance of health service delivery and consequently leads to better health status of community served (3).

Despite institutional efforts for strong guidance, data quality and information use remain weak within the health sector in Ethiopia particularly at the peripheral levels of administrative health units which have primary responsibility for operational management under the woreda decentralization process begun in 2002 GC (4).

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 (1).

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 (10).

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

For the purpose of this project that is for data quality and information usage improvement purpose, the PRISM tool was adopted for baseline assessment of health management information system performance in terms of its data quality and continuous information use. In addition, the PRISM tool was adopted to place the routine HMIS process at Beghi District in a context of its technical, behavioral and organizational determinants whose relative importance, as measured by adopted PRISM tool, enables to generate and implement possible interventions for data quality and information usage improvement purpose. Post interventions review was conducted in order to assess changes in view of making recommendations.

1.2. Statement of the problem

Currently health information quality and its utilization for local action-oriented performance monitoring is found poor within health sector in Ethiopia, particularly at woreda health office and health facility level which are primarily responsible for operational management (4).

Despite the institutional will is clearly strong, and appropriate institutional reforms to improve health management have been initiated, Ethiopian HMIS process and its performance remain weak in terms of producing better quality data and continuous information use within health sector particularly for local action-oriented performance monitoring (6).

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. However, the quality of the data produced by such systems is often poor and the data are not used effectively for decision-making in developing countries. Although there has been increasing international attention given to the need of developing strong health management information systems, it has proved difficult to do so for several reasons (8).

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 (9).

Now days due attention has been given for improving performance of health services delivery and its management information system which is widely seen to be attributed to better performed HMIS process at each level of health system. Despite the potential of HMIS process in supporting strategic planning, efficient allocation of scarce resources and effective targeting of intervention to those in greatest need leading to better health outcome, countries with the highest burden of illness and with the urgent needs for proper generation and use of evidence have the weakest HMIS process and performance in the vast majority of world's poorest countries (11).

Key problems of Health Management Information System (HMIS) process in four countries (Lesotho, Mauritius, Sudan and Tanzania) were the fragmented nature of responsibility for data and disease-focused demands by different vertical programs and donors which result in: unprocessed health data; or if processed, unanalyzed; if analyzed, not read; if read, not acted

upon. Only a little proportion of health information affects decision-making particularly at districts and health facility level (13)

Study conducted in Amhara regional state showed that use of health information at District and health facilities levels was partial and uneven. Data based monitoring and planning was not inherent at District level. In addition, research conducted in North Gondar indicated that out of data collected daily, only 22.5% of them utilized. Moreover among 45 units of HIV/AIDS in the study area, only 17.7% 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 (25).

Therefore, this project was designed to greatly improve the current status of HMIS performance in the project area. It aimed to improve HMIS data quality and information use practice for local action-oriented performance monitoring and perhaps as an initiative and reference to other project.

1.3. General Objective

Creating a baseline for HMIS performance and its determinants to formulate and implement possible interventions and review post interventions changes in view of improving HMIS data quality and information use in Beghi District

1.4. The specific objectives:

• Assess the technical, behavioral and organizational determinants affecting HMIS performance

• Estimate to what extent the determinants affect the level of HMIS data quality and use of information

• Formulate and implement possible interventions to improve HMIS data quality and information usage for local action-oriented performance monitoring

• Conducting post interventions review to assess changes as a result of interventions to make recommendation

1.5. Scope and Limitation of the project

1.5.1. Scope

The project was mainly limited at generating and implementing possible interventions for improving routine HMIS performance (producing better quality data and continuous information use) as well as review post interventions changes achieved in Beghi District.

On other hand, the project attempted to improve HMIS information quality for supporting improved health management, improve HMIS information use in internal health management and to enhance credibility in reporting to external agencies at Begi District health office and its health facilities level.

1.5.2. Limitation of the project

This project had various limitations. These were:

- ❖ Time and budget limitation: Time for implementing improvement interventions of this project was short and also the total budget for the project was not enough to implement further interventions.
- ❖ Experience of the project manager for project execution was the basic limitation.
- ❖ Implementation period of the project was overlapped with the national election campaign that makes key stakeholders busy to actively participate in the project.

1.6. Significance of the project

Despite institutional will and guide to correct it is clear and strong, HMIS information quality and usage for monitoring and evaluating performance of health sector found weak within Ethiopia. In addition, assessments of the existing state of the health information system show that among the six major components, three were very weak. These were HIS resources, data management, and health information dissemination and use rated as "not adequate". Recent researches showed that for improving the performance of HMIS process at each level of health system; not only technology acquisition is required but it is equally important to improve the understanding of health managers and health professional 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. Thus, proper interventions for increasing the proportion of staffs that are competent enough on HMIS tasks seem likely significant project (4), (9), (10).

For information to influence management in productive manner, it has to be of better quality and used continuously by managers and all stakeholders at all health management spirals for improved performance of health service delivery leads to improved health outcome (2).

Therefore, the project on HMIS data quality and information usage improvement is very significant for improving HMIS information use in internal management, improving HMIS information quality to support improved health management and to enhance credibility in reporting to external agencies in order to direct toward improve performance and remove obstacles in the Beghi District health office and its health facilities which has primary responsibility for operational management.

CHAPTER TWO: LITERATURE REVIEW

The literature review section provides general conceptions on data quality and information use for evidence based decision making toward health services performance improvement. It also highlights the Performance of Routine Information System Management (PRISM) framework, which was used as guide to plan, execute and review this project work. The related works reviewed for this work were then presented.

2.1. General Literature

2.1.1. Health management information systems' importance and its current status

Strategic planning and management is prerequisite for effective and efficient health service delivery in a way that minimize losses in effectiveness. Unfortunately, current health management information systems in most countries found inadequate in providing the information support needed. Furthermore, the generated data are often not useful for evidence based decision making because they are incomplete, inaccurate, untimely, obsolete, and unrelated to priority tasks and functions. In other words, a large part of the data collected passes to the next higher level without being analyzed and used, and frequently ends up on the dusty shelves of an office (2).

The Government of Ethiopia (GOE) has guided all public sectors towards results-oriented management, emphasizing evidence-based decision making directed towards performance improvement. FMOH bases its activities on the implementation framework of the Health Sector Development Program (HSDP), which has four successive strategic plans since 1997/98 GC. Each of these plans has identified strengthening Monitoring and Evaluation / Health Management Information System as a key strategy for successful implementation (4).

Good management is critical for improvement of the efficiency and effectiveness of health services. The challenge for health systems is to optimize the management of service delivery in a way that minimizes losses in effectiveness. The World Health Organization has long identified better performed health management information systems as critical for achieving improved health outcome of the community served. However, many of the HMIS data recorded and reported by the health service staffs are not needed for the tasks the staffs perform. Data

collection tends to focus on disease reporting and the generated health information is poorly utilized for local action oriented performance monitoring at each level of health system (2).

An improved and harmonized health reporting system is critical for health system strengthening if and only if it can generate timely, accurate and complete information for proper planning, successful implementation, monitoring and evaluation of service delivery at all levels of the health system. However, in most developing countries, particularly in sub-Saharan Africa, health reporting has been dominated by paper-based data collection and storage systems that tend to generate poor quality data (inaccurate, untimely and incomplete reports) and weak information use that compromises health service delivery (9).

Institutional will and guidance to correct poor information quality and usage are strong and clear for improving information use in internal management and improving the quality of information to support improved management and to enhance credibility in reporting to external agencies. Thus, five strategic issues have been identified as critical to strengthen and continuously improve HMIS performance of health sector in view of achieving the above mentioned strategic objectives. These are: capacity building, standardized and integrated data collection and reporting, linkage between information sources, information use (Action-oriented performance monitoring) and appropriate technology (4).

Furthermore, as the better HMIS process has being important, it is meaningless without the commitment of the health managers and administrators to ensure data quality and make use of the health information for local action-oriented performance monitoring. This commitment is vital to build the sense of responsibility and motivation on the concern of appropriateness and quality of data, the reliability and utility of the health information (evidence) and the validity of the conclusions(1).

MEASURE Evaluation has developed a conceptual framework to evaluate routine health Management information systems (HMIS), called Performance of Routine Information System Management (PRISM). The PRISM framework is grounded in a systems perspective, focusing on problem solving and continuous improvement - an important strategy- particularly in developing countries where routine HMIS may be prone to weaknesses. PRISM highlights

routine HMIS performance in terms of improved data quality and continuous information use. In addition, it places routine HMIS performance in the context of technical, behavioral, and organizational determinants (15).

PRISM conceptual framework: PRISM broadens the analysis of routine health management information system performance to include three key categories of determinants that affect it:

Technical determinants – data collection forms, processes, systems, and methods;

Behavioral determinants – the knowledge, skills, attitudes, values, and motivation of the people who collect and use data; and

Organizational determinants – information culture, structure, resources, and roles and responsibilities of key contributors at each level of the health system (15).

The PRISM toolset

The PRISM toolset includes the following data collection tools and instructions on their usage:

Performance of HMIS Diagnostic Tool: This tool captures the technical determinants of RHIS performance, such as level of complexity of data collection forms and user-friendliness of information technology and determines the overall level of RHIS performance, i.e. the level of data quality and use of information.

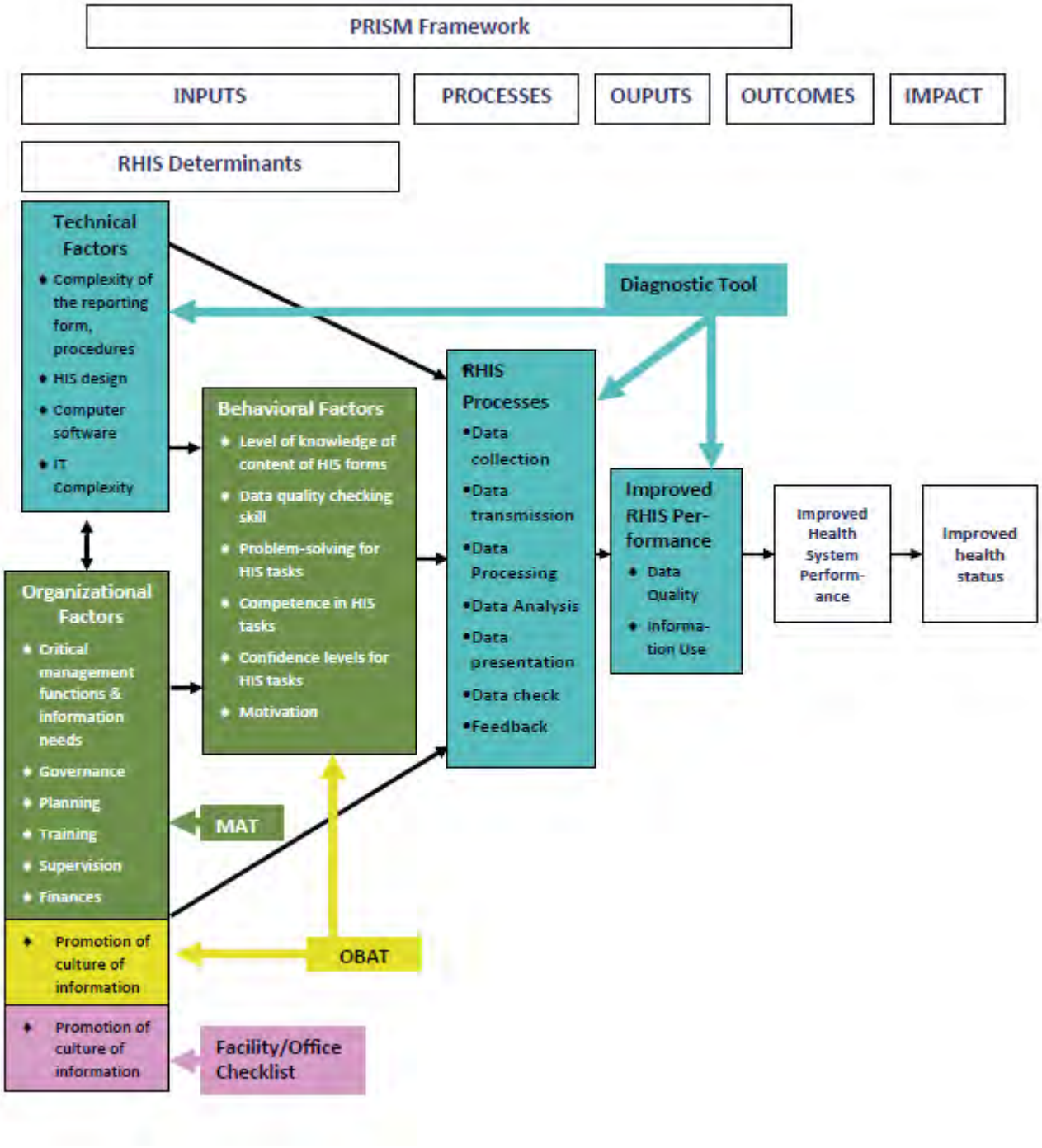
Overview and Facility/Office Checklist: This tool also examines technical determinants of RHIS and it allows understanding the availability and status of RHIS resources necessary for RHIS implementation at the facility and district levels.

Organizational and Behavioral Assessment Tool (OBAT): This tool identifies behavioral factors include level of data demand, motivation, confidence, task competence, and problem-solving skills and organizational factors include level of promotion of a culture of information, and the existence (or not) of a reward system which affect RHIS performance (15).

PRISM Tools Package

The PRISM Tools Package is a set of routine HMIS performance assessment tools that are developed from the PRISM conceptual framework. When used as a whole, the package will provide a comprehensive picture of routine HMIS performance and its contributing factors in the technical, organizational, and behavioral areas. Results will allow users to develop multidimensional interventions to improve HMIS performance (15).

Figure 1: PRISM Framework



Source: PRISM Tools User Guide, MEASURE Evaluation/JSI Publication, 2009

2.2. Review of Related works

Evaluation of the effect of an intervention to improve the quality of data used to monitor the prevention of mother-to-child transmission (PMTCT) of the human immunodeficiency virus in South Africa showed that the proportion of data in the health information system considered as accurate increased from 37% before to 65% after intervention. Similarly, the level of data completeness increased from 26% before to 64% after the intervention (17).

As shown by various studies, routine HMIS in most developing countries produce low quality data and so, the use of information for planning and management of the health services is weak. Currently a baseline for routine HMIS performance available in many countries showed that data quality ranged between 34% and 72%; and use of information between 30% and 53%. This is due to such root causes as lack of standardization of HMIS data management processes as well as the absence of an information culture (18).

Baseline assessments conducted on status of routine HMIS performance showed an average of 55% data accuracy level in health facilities. Between 2008 and 2012, data accuracy improved in Cote d'Ivoire by 17% at health facilities and doubled (from 40% to 81%) at district level (19).

Study conducted on determinants of health information use in Malawi, Nathenje health area of Lilongwe District indicated that information usage practice was poor at facility level and that only 30% of the facilities used information and 20% were making decision after discussion. Ten percent of the facilities showed promotion of information use indicating that low level of senior management support to promote the use of information (19).

Assessment of national health information system in Guanajuato state, Mexico revealed that data accuracy was more than 95% at facility level and 75% - 85% at district level for all selected service indicators and completeness for filling the monthly report at facility level was only 22% while at the district level it was 100%. It also showed 53% of the facilities were demonstrated information use for decision making (20).

Assessment of immunization data quality from routine reports conducted in Mozambique showed that reported figure on all vaccine types in three sets of data were different when compared tally sheet with facility registers and district reports. The reported figure by health facility on all vaccine types showed increase averagely by 7% compared to the tally sheets.

Differences were also seen between the reported figures on all vaccine types by health facility when compared to District reports (21).

HMIS process and its performance

HMIS process

Assessment undertaken at Guanajuato State in January 2010 also indicated the Routine Health Information System process in terms of *Data collection, Data quality check*, *Data completeness, Data transmission, Data analysis, Data display*, *Feedback* as follow:

Data collection: 51% of the facilities reported having a data collection procedures manual.

Data quality check: 40% of the facilities reported having a mechanism for checking data quality.

Data completeness: 40.1% of the facilities reported having a process for checking data completeness.

Data transmission: 48.8% of the facilities showed meeting all criteria for data transmission process.

Data analysis: 60.4% of facilities perform data analysis, but with less emphasis on comparisons among types of services.

Data display: 75% of the facilities exhibited some types of data, mostly for maternal and child health and more than 90% of these facilities have updated them in last three months.

Feedback: 57.8% of the facilities showed documentation of having received feedback reports, while eight districts (100%) stated that they send feedback, indicating a gap in feedback communication (22)

HMIS performance

Assessment undertaken at Guanajuato State, Mexico, in January 2010 to measure and improve routine Health Information System (HIS) performance showed the routine health information system performance in terms of *data accuracy, completeness, timeliness, use of information* as follow:

Data accuracy: Data accuracy at the facility level was above 95% for all indicators such as Antenatal care first visit (ANC1), malnutrition in children<1, and diabetes cases. The accuracy at the district level was found to be 85%, 75%, and 75% for (ANC1), malnutrition in children < 1, and diabetes cases respectively.

Completeness: Completeness for filling the monthly report at the facility level was only 22% while at the district level it was found to be 100% for three districts; five other districts had no data on completeness

Timeliness: Two out of eight districts did not have records to measure timeliness. The six districts that had records showed 62.7% timeliness, indicating in those districts 62.7% of facilities met the deadline.

Use of information: 61% of the facilities showed documentation on holding meetings. Of those facilities, 41% discussed and made decision using routine HMIS information, while in 27% of the facilities, decisions were referred to a higher level for action. Sixty four percent of the facilities had reports (feedback, monthly, quarterly, others). Out of those facilities, reports showed decisions for strategy review (94%), adjust personnel (92%), advocacy (84%), and mobilizing resources (76.2%) (22).

Determinants of HMIS performance

Three key categories of determinants that affect routine HMIS performance were assessed at Guanajuato state, Mexico, in January 2010 and reported as follow:

Technical Determinants:

 More than 87.5% of the district respondents felt that the procedure manual, information technology and HIS software are user-friendly.

 87.5% of the staff believed that the routine HMIS software program provides a comprehensive picture of the health system performance.

 50% of the respondents believed that the various information systems are integrated or existing software could integrate vertical program information.

Behavioral Determinants:

 Perceived confidence level on HMIS tasks: the average confidence level for collecting data, checking data quality, calculation was above 74.2%, but the average confidence level was low for data interpretation 70.9% and use of information 73.4%.

 Motivation: 69.2% of respondents believed that HMIS tasks bring about positive outcomes.

 HMIS task competence: When given HMIS tasks to perform, 76.1% and 76.3% of respondents were able to calculate two or more of the given three calculations on percentages/rates and plot data respectively. However, the mean competence level dropped for interpretation to 36.5%, use of information 43.2% and checking data quality 55.6%.

Organizational Determinants:

 Promotion of a culture of information: overall the facility respondents strongly believe (mean score 73% or above) that the health department promotes an emphasis on data.

Activities for promotion of a culture of information: activities observed at the facility level were: communication about targets 63.9%, directives to use information 51.2%, sharing of success stories 28%, and the presence of advocacy using HMIS information 51.8%. These activities were more often observed at the district level but the response pattern remains the same at facility level. Only that of sharing stories of information differed which was half at the facility level.

 Supervision: 47.6% of the facilities reported having one or more supervisory visits in last three months. Of those facilities visited, 84.8% reported that supervisor checked data quality, 68.4%, discussed facility performance using HMIS information, 69.6% helped them make a decision, and 73.4% stated supervisors sent feedback in the last two months.

 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%) (23).

2.3. Summary of the chapter

Summary of the experience learned from the related works reviewed has been summarized as follow:

- The efforts of improving routine HMIS performance can greatly benefit from the PRISM framework based baseline assessment. In addition, 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 accessibility, coverage, efficiency and quality of health services.

- The PRISM framework and tools largely support the Health Metrics Network (HMN) framework and tools which have two broad purposes: First, assists standardization of country health information system that can serve as a benchmark for baseline system assessments. Second, allows access to and better use of quality health information for evidence-based decision-making

- Culture of information can be promoted and enhanced through simple, strategic and practical interventions such as better role modeling and dissemination of success stories of information use for local evidence based decision-making in operational management.

In addition, I used the idea obtained from review of literatures and related works in discussion section of the project.

CHAPTER THREE: METHODS

The third chapter presents the methods employed for this project work that comprises the project setting, project study design, project study population, project study variables, data collection instrument, data quality issues, ethical consideration, result dissemination, intervention and its strategy and operational definitions.

3.1. Project setting

The project was carried out at Beghi District in West Wollaga zone between January to June/2015. West Wollaga zone is found 445 kilometers from Addis Ababa. The total population of Beghi District is estimated to be 149,459.The climate of the District is woina dega and farming is the predominant source of livelihood. Beghi District has 1 functional governmental primary Hospital and 5 Health centers and 42 community Health posts. In addition, the District has 1 EECMY clinic, 2 medium clinics, and 21 small clinics.

3.2. Project Study Design

A facility based cross- sectional descriptive study design was used to highlight the routine HMIS performance in terms of improved data quality and continuous use of information. In addition, the technical, behavioral and organizational determinants of HMIS performance were assessed to generate and implement possible interventions. Post interventions review was conducted to assess changes in a view of making recommendations.

3.3. Project Study Population

All of 106 health professionals including the health facility managers and people working on HMIS in Beghi District were included in the project study. In addition, registered data and facility's reports were assessed using adopted PRISM toolset to check HMIS data quality and information use.

3.4. Project Study Variables

3.4.1. Independent Variables

Independent variables of the study were the factors grouped under three key categories of determinants affecting HMIS performance. These were:

- Technical determinants that is user friendliness of HMIS tools like registries, HMIS manuals and reporting forms
- Organizational determinants that is promotion of information culture, supervision quality and availability of HMIS resource.
- Behavioral determinants that is respondents' confidence level for HMIS tasks, competence level in HMIS tasks, knowledge of rationale for data collection and methods of checking data quality, and problem solving skill in HMIS tasks.

3.4.2. Dependent Variables

Dependent variables of the study include:

- HMIS data quality (data accuracy, completeness and timeliness)
- HMIS information use practice (HMIS data display and HMIS data analysis)

3.5. Survey Methodology

Beghi District has 5 Health centers. Each health center is comprised of its own satellite health posts connected to each other by a referral system based on geographical proximity. In accord with this division, the District HMIS performance assessment was conducted at all the five Health centers (HC) and the Woreda Health Office (WorHO). Those Health centers were: Beghi HC, Gunfi HC, Kobor HC, Shombo HC, and Tulu HC which comprises 15, 12, 5, 5 and 5 satellite health posts respectively. According to the PRISM conceptual framework, the District routine HMIS performance can easily be assessed by randomly selecting its 19 health facilities, if its total health facilities are 30 or more (15). According to this framework, 14 health facilities are needed in addition to 5 health centers in order to include 19 health facilities of the districts. Thus, 14 health posts were randomly selected from sampling frame of 42 health posts in the Beghi District. In order to proportionate the satellite health posts selection under each Health center, proportionate allocation sampling was used. That is by the formula:

$ni = \frac{n}{N} * Ni$, Where; N is all of the 42 health posts in the District, n is the 14 health posts to be included, Ni is the number of satellite health posts under the respective Health center and ni is the proportional satellite health posts to be selected from the respective Health center.

All of the health professionals in the selected health facility were included in the project work.

3.6. Data Collection Instrument

Self-administered questionnaires adopted from organizational and behavioral assessment tool of PRISM toolset were used to provide baseline of behavioral and organizational factors affecting routine HMIS performance. HMIS performance diagnostic tool was adopted from PRISM toolset in order to capture technical determinants of routine HMIS performance that is level of complexity of data collection forms and its user-friendliness as well as to provide a baseline of routine HMIS performance such as the level of data quality and use of information in Beghi District. In addition, facility checklist was adopted in order to list the availability and status of routine HMIS resource necessary for routine HMIS implementation at facility level. Management Assessment Tool (MAT**)** was adopted to take rapid stock of the routine HMIS management practices and developing possible intervention for better management.

3.7. Data Quality Issues

The questionnaires were adopted from PRISM Framework, Measure Evaluation and WHO guidelines. The adoption of questions from these guidelines and framework was based on the definition given to HMIS and its components by South African development community (12). The questionnaires were adopted in English. Pre-testing of the questionnaires was conducted in the Beghi District using randomly selected twenty individuals to assess clarity, understandability, and flow of questions as well as the time needed to fill the questionnaires. Based on the findings some questions were restructured.

3.8. Ethical Consideration

The project work was conducted after the approval of the project by the ethical clearance committee from Addis Ababa University and after a formal ethical clearance was obtained. Before conducting the survey, written permission was obtained from the Oromia Regional health Bureau and West Wollaga Zonal Health Department and Beghi woreda health office. The data collection consent was obtained from the Beghi woreda health office. All the project participants were briefed on the purpose and benefits of the project and the consent was obtained in advance from each participant. At the same time, data collectors told the respondents the ethical prerequisites for the questionnaires, where and how the writer is going to present the results. The data collectors clearly expressed the emphasis given to bring up the rules to maintain the respondent's anonymity. After explaining the ethical issues and get an informed consent from the

respondent, the data collectors collected the data in the suitable area that can avoid an interruption. In this manner the questionnaires were filled.

3.9. Dissemination of results

After the project was completed, the achieved results were disseminated to Addis Ababa University and Begi woreda health office that potentially could benefited from the deliverables of the project. The report of the project should be placed in the libraries of Addis Ababa University as well as filed at Begi woreda health office as reference for those who are interested to make further research in the area of HMIS performance and its determinants.

3.10. Operational Definitions

Behavioral determinants – refers to the knowledge, skills, attitudes, values, and motivation of the people who collect and use data that affect HMIS performance (15);

Confidence: How comfortable a person feels to perform a certain tasks and judging his/her abilities to organize and execute courses of action required to attain a certain types of designated performance.

Data quality: refers to state of data accuracy, completeness and timeliness that make data appropriate for use in identifying gaps, setting targets, making various decisions and providing evidence based feedback.

Data accuracy: refers to that the data compiled in reporting forms is accurate and reflect consistency between what is in reporting forms and in what is in registries at health facility level. Similarly, it refers to that when data entered in to computer file, there is no inconsistency between figures in reporting forms and computer file at woreda health office.

Data completeness: refers to two contexts:

(a) degree to which all data elements in the report form are filled against total number of all HMIS data elements supposed to be filled and
(b) Weather all health administrative units have reports from all health facilities and/or lower level health administrative units within their administrative boundary.

Data elements: refers to name of a particular event counted or measured. In a context of HMIS, data element means health event or health related events. Example: Number of birth attended by skilled health professionals, Number OPD attendance of female 15 years and above, Number of malaria (with p.falcifarum): female under five years of age, Number of children under 1 year of age who received measles vaccine etc

HMIS: an organized system of recording, record keeping, processing, reporting and use of generated information in health sector

Information culture: refers to capacity and control to promote values and beliefs among members of an organization for data collection, aggregation, transmission, analysis and evidence based decision making in accomplishing organizational mission and goals (15).

Indicator: refers to a variable that measure one aspect of a program or project which directlt related to the program/project objectives.

Organizational determinants – information culture, structure, resources, and roles and responsibilities of key contributors at each level of the health system (15);

Technical determinants – data collection forms, processes, systems, and method (15)

CHAPTER FOUR: RESULTS AND DISCUSSION

The findings of this project were first presented as *the baseline HMIS data quality and information usage practices and its technical, behavioral and organizational determinants* before intervention in Begi District. Then the implemented interventional activities aimed to improve HMIS data quality and information use practice during this project has been presented. Finally the achieved improvement on *HMIS data quality and information use practice, and its organizational determinants* by improvement interventions of the project, as identified by post interventions review, have been compared to the baseline data on routine HMIS performance and its determinants before interventions in view of making recommendation.

4.1 Description of the Project's Assessment Methodology

This project involved a total of 19 health facilities that include five health centers and fourteen health posts as well as the woreda health office within Beghi District. This number of health facilities was taken according to the PRISM user guide which recommends that the District routine HMIS performance can easily be assessed by randomly selecting its 19 health facilities, if its total health facilities are 30 or more (15). All health professionals including health facilities managers and people working on HMIS in Beghi District were included in the project. The total number of participants involved was 106. 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.

4.2 Pre-intervention assessment results

Baseline HMIS Performance: HMIS data quality and information use within Begi District

Dimensions of the HMIS data quality involved by pre-intervention assessment of this project were data accuracy, completeness and timeliness of HMIS monthly report.

4.2.1 HMIS data quality

4.2.1.1 HMIS data accuracy at health facilities level

The routine collection of HMIS data at health facilities started with information collected in the registries at each services delivery points. Thus, the staffs at each department of health facilities collected data and sent monthly report on paper to HMIS unit during every monthly reporting period. Then, the monthly summaries of HMIS reports were converted in to electronic format by

Health Information officer at the health facilities and sent to the district health office (this was at only one Health center in the project area). But, at the rest of health centers the monthly summaries of HMIS report were produced on paper at health facilities by the facility manager and sent to the district health office.

For pre intervention assessment of this project, seven data elements:(a) Number of repeat Contraceptive Acceptors, (b) Number of pregnant women that received ANC at least four visits, (c) Number of birth attended by skilled professional, (d) Malaria (confirmed with P. falciparum) for female under five years of age, (e) OPD attendance of female 15 years & above, (f) Clients (20-24 years :female) receiving HIV test results (at VCT) and (g) Number of children under one year of age who have received measles vaccine were purposefully selected for assessing HMIS data accuracy. Records from 21 July to 20 august/2014 and from 21 November to 20 December/2014 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.

Table 1 below shows the routine HMIS data accuracy by the data elements and by health facility types.

The findings of pre intervention assessment of this project showed that overall in about 65% cases the data elements properly matched between what is in registers and what is in reporting forms at health facilities level. However, the data accuracy was100% at woreda health office level

Table 1: HMIS data accuracy at health facility level before intervention

Data elements	Health facility by type HPts=14, HCs=5, All HFs=19	Recounted figure from Registries	Reported figure in report form	Percent of data accuracy
Number of repeat Contraceptive Acceptors	Health posts	84	112	75
	Health centers	103	119	87
	All Health facilities	187	231	81
Number of pregnant women that received ANC at least four visits	Health posts	-	-	-
	Health centers	21	98	21
	All Health facilities	21	98	21
Number of birth attended by skilled professional	Health posts	-	-	
	Health centers	39	55	71
	All Health facilities	39	55	71
Number of children under one year of age who have received measles vaccine	Health posts	33	48	69
	Health centers	22	31	71
	All Health facilities	55	79	70
Malaria (confirmed with P. falciparum) for female under five years of age	Health posts	2	2	100
	Health centers	11	11	100
	All Health facilities	13	13	100
OPD attendance of female 15 years & above	Health posts	9	12	75
	Health centers	14	17	82
	All Health facilities	23	29	79
Clients (20-24 years :female) receiving HIV test results (at VCT)	Health posts	-	-	-
	Health centers	6	21	29
	All Health facilities	6	21	29
For all cases of the seven selected data elements	**Health posts**	**128**	**174**	**74**
	Health centers	**216**	**352**	**61**
	All Health facilities	**344**	**526**	**65**

4.2.1.2 HMIS report completeness at health facilities

HMIS report completeness has two meanings according to the context of Health Administrative units. These are whether:

- All the HMIS data elements in a report forms or database are filled and

- All the health administrative units have reports from all the health facilities or lower level health administrative units within their administrative boundary (16)

4.2.1.2.1 HMIS Report data Completeness

For the pre-intervention assessment of this project, the completeness of routine HMIS monthly reporting was measured in terms of whether Health Facilities reported all the HMIS data elements filled against the total number of HMIS data elements that the Health facility was supposed to fill. Accordingly, HMIS monthly reports that were routinely reported by Health centers and satellite Health Posts during **21 July to 20 august/2014** and **21 November to 20 December/2014 G.C** were assessed in order to measuring completeness of routine HMIS monthly report data at health facilities. The result showed that during **21 July to 20 august/2014** and **21 November to 20 December/2014 G.C**, only 32% and 42% of the health facilities respectively reported all the HMIS data elements filled against the total number of HMIS data elements which the Health facility was supposed to fill. (Table 2 and Table 3)

Table 2: HMIS monthly reports' data completeness at Woreda Health Office Level during 21 July to 20 august/2014 G.C

Facility Type	Number of health facility by type	# of HFs reported complete Monthly HMIS data	% of HFs reported complete Monthly HMIS data
Health posts	14	3	21
Health centers	5	3	60
Total health facilities	**19**	**6**	**32**

Table 3: HMIS monthly reports' data completeness at woreda health office level during 21 November to 20 December/2007E.C

Facility Type	Number of health facility by type	# of HFs reported complete Monthly HMIS data	% of HFs reported complete Monthly HMIS data
Health posts	14	5	36
Health centers	5	3	60
Total HFs	**19**	**8**	**42**

4.2.1.2.2 Completeness of health facility's monthly reporting

In addition, for the pre-intervention assessment of the project, the completeness of the HMIS monthly reports at woreda level was assessed by how many health facilities in the Beghi woreda that were supposed to report are actually reporting to the Woreda Health Office. To do so, the number of available routine HMIS monthly reports that were routinely reported during **21 July/2006 to 20August/2006 and 21 November/2007 to 20 December/2007** was recounted. The findings showed that about 96% of the health facilities that were supposed to report were found actually reporting to Beghi woreda health office (Table 4).

Table 4: Health Facility's Monthly Reporting Completeness

Woreda	MM/DD/YY E.C	# of HFs supposed to report	# of HFs actually reporting to WorHO	% of HFs' reports available at WorHO
Beghi WorHO	21/11/2006 - 20/12/2006	50	47	94
	21/03/2007 - 20/04/2007	50	49	98
	Average	**50**	**48**	**96**

4.2.1.3. Timeliness of HMIS data reporting to respective level

Another dimension of routine HMIS data quality that was assessed at pre-intervention assessment stage of this project was timeliness of monthly HMIS data reporting. Timeliness of monthly HMIS data reporting is measured by observing Health facilities' records kept as to measure timeliness. In addition, timeliness of monthly HMIS data reporting is measured by checking whether HMIS data reporting by the health facilities met the predetermined deadline of reporting period. The results showed that both health facilities and woreda health office did not keep records to measure timeliness of monthly HMIS data reporting. As the reporting date on the report form indicated, 89% of the health facilities found reporting within the predetermined reporting deadline during 21 November to 20 December/2007. Thus, the identified problems were that at each health administrative unit, the HMIS focal person did not keep records of receipt and transmission of the monthly HMIS report from and to the respective health unit level. This situation was leading both health facilities and woreda health office fail for identifying those who have or not submitted the report within the predetermined reporting deadline and ensuring the timely reporting.

4.2.1.4. HMIS data quality checking practice

A shown by table 5, 79% and100% of the Health Posts and Health Centers respectively have been found visited by supervisors for the purpose of supportive supervision and 88% of the supervised Health facilities (the Health Posts and Health Centers) received action-oriented feedback on the basis of supervision in the last 3 months. Out of supervised Health Posts and Health Centers, in none of them the supervisors had carried out data quality check.

Table 5: Data Quality Check at Health Posts and Health Centers

Facility Type & their number	**# of HFs that have been supervised during past 3 months**		**Among Supervised HFs those received feedback after supervision**		**Among Supervised HFs, those where data quality check had been carried out (in number)**
	Number	Percent	Number	Percent	
HPts (n=14)	11	79	9	82	0
HCs (n=5)	5	100	5	100	0
TOTAL (N=19)	**16**	**84**	**14**	**88**	**0**

4.2.2. HMIS Information Use practices

The practices of HMIS information use were assessed by conducting observation of action-oriented feedback given on the health facilities' performance in the view of local action-oriented performance monitoring both at the health facilities and woreda health office. In addition, it was also assessed by observing the presence of HMIS data display by table, chart or graph on core indicators and the presence of analysis of HMIS data in terms of conducting comparison of the data over months/quarters, comparison of service coverage by types and comparison among facility's catchment area. Results of the HMIS information usage assessment were presented as following:

4.2.2.1 HMIS Information Use

The result showed that 88% of health facilities in the project area have received feedback during past three months on their performances from their higher level administrative unit although it was sporadic and insufficient.

4.2.2.2. HMIS data Display

The presence of data displayed by of tables, charts or Graphs on (a) Maternal health indicators, (b) Neonatal and child health indicators (c) Malaria indicators (d) Quality of Health service indicators (*Proportion of bed occupancy, OPD attendance per capita, customer satisfaction index*), (e) Hygiene and Environmental Sanitation indicators and (f) Nutrition indicators were assessed to know the level of HMIS data display at the health facilities and woreda health offices. As shown by table 6 below, 16 (84%) health facilities were displaying data on only ≤ 2 indicators; of them 6 (38%) HFs had all the indicators updated over the last 3 months period.

Table 6: HMIS Data Display at Health Facilities Level

No. of indicators on which HMIS data were displayed by HFs (N= 19)	No. of HFs displaying HMIS data on these number indicators	No. of HFs with all displayed data updated	No. of HFs with at least one displayed data updated
All 6 indicators	0	0	0
5 indicators	0	0	0
4indicators	2	1	1
3indicators	1	0	1
≤ 2 indicators	16	6	10
Total (≤2– 6 indicators)	**19**	**7**	**12**

4.2.2.3. HMIS data Analysis

As shown in Table 7 below, various types of HMIS data analysis were carrying out at Begi Woreda Health Office level. These were generating summary reports for Zonal Health Department; calculate some indicators for each facility catchment area, comparison of HMIS data over time (either by month or quarter) and comparisons among PHCU. However, particular gap on comparison of service coverage by types and with woreda/zone target was found at the woreda health office level.

Table 7: WorHO level HMIS Data Analysis Practices

HMIS Data Analysis by type	Is Begi WorHO performing the analysis of HMIS data by?	
	YES	NO
Summary report generation for Zonal Health Department	✓	
Calculate some indicators for each facility catchment area.	✓	
Comparison of HMIS data over time (either by month or quarter)	✓	
Comparison among service coverage types		✓
Comparison with woreda/zone target		✓
Comparisons among PHCU and/or HFs	✓	

At Health facilities case particularly at health centers level, among five HCs none of them conduct all type of HMIS data analysis except generating summary report for woreda and comparing HMIS data over time.

4.2.3. Determinants of HMIS Performance

As asserted by the PRISM conceptual framework, better HMIS performance measured in terms of better quality data and continuous information use is a function of better routine HMIS processes and their technical, behavioral and organizational determinants (15).

4.2.3.1 Technical determinants of HMIS performance

Technical determinants of HMIS performance are often make confusion with the behavioral determinants, particularly with staffs' knowledge and skills for accomplishing routine HMIS tasks. However, technical determinants of HMIS performance can be clarified as factors that need special know-how and its absence affects confidence levels and motivation of health staffs in accomplishing Routine HMIS tasks (15). On other hand, it is a factor related to the specialized know-how to manage and improve routine HMIS processes that affect HMIS performance both

directly and through behavioral factors. It also looks at availability and user friendliness of data collection forms and procedures (18).

The technical determinants of HMIS performance both at Health facilities and WorHO level were assessed during pre-intervention assessment of this project by discussing with Performance Monitoring Teams (PMT); and where PMT is not established, with health facilities management teams on the issue of user friendliness and comprehensiveness of HMIS tools like registries, reporting forms, HMIS manuals as well as on difficulty of analyzing, using and transferring HMIS information to HMIS Unit then to District Health office as well as to ZHD.

The result showed that HMIS tools were comprehensive and user friendly. However, facilities' PMT or management teams agreed that there was gap related to know-how of managing and improving HMIS processes that affect routine HMIS performance.

4.2.3.2. Behavioral determinants of HMIS performance

If health professionals have better understanding on importance of HMIS tasks and have high self-efficacy (confidence), better problem solving skills and competency in doing HMIS task, then they would complete a given HMIS tasks perfectly (12).The behavioral factors' level assessed by the pre intervention assessment were level of confidence for HMIS tasks, HMIS task competency and problem solving skills as well as knowledge of health professionals on the rationale of including particular information during data collection as well as on method of checking data quality to assess the behavioral determinants of HMIS performance in the project area.

4.2.3.2.1 Confidence Level in HMIS tasks

Confidence levels of health professionals for HMIS tasks were assessed by scale rated from 20% to 100% that means less confidence to high confidence in accomplishing a particular HMIS task. The findings of pre-intervention assessment of this project showed that average confidence levels of respondents (health staffs) for calculating percentage or rates correctly, plotting data by months or years, explain findings or trends and use of HMIS data for identifying gaps, setting targets and making decisions were about 80%, but average confidence levels (self-efficacy level) of health staffs for checking HMIS data quality were about 60%. This illustrate that respondents

felt more confident in calculating, plotting, and using of HMIS data than checking HMIS data quality.

4. 2.3.2.2. Competency in HMIS tasks

Competency in HMIS task was measured through making respondents solving problems given on a paper test at pre intervention assessment stage of the project. The result showed that on average, about seventy three percent (73%) of respondents were able to calculate percentage and plot the given data by months/years diligently. However, about eighty six percent (86%) of respondents were unable to interpret the findings and use the information for identifying gaps and setting targets. These findings indicate that data are most commonly collected for reporting purposes than for local action oriented performance monitoring to improve performance and remove obstacle. As it is obviously expected, the result indicated that as one go down from WorHO to health center and from health center to health posts competency levels of health staffs in HMIS task decreases. The result also showed that health professionals' skill for analyzing and interpreting HMIS data as well as their knowledge on rationale of data collection and on method of checking data quality was slightly lower although they had relatively higher confidence level for the HMIS tasks.

4.2.3.3. Organizational Determinants

Dimensions of organizational determinants affecting HMIS performance assessed during pre-intervention assessment of this project were Supervision Quality, promotion of information culture and HMIS resources availability as key contributors of HMIS performance at district and facility level.

4. 2.3.3.1. Supervision Quality

The findings of pre-intervention assessment of the project showed that supportive supervisions aimed at improving routine HMIS performance, particularly to produce better quality data and continuous information use were insufficient and sporadic both at health center and health post level. About 79% of health posts and 100% of health centers had received supervisory visits during the last three months. Those health posts and health centers which received supervisory visits reported that HMIS data quality and information use was not investigated during the supportive supervisory visits. Another dimension of supportive supervision quality that was assessed was action-oriented feedback provided after supervisory visit as to motivate health

professionals to improve and/or maintain HMIS data quality and information use. Of the supervised health facilities 100% of the health centers and 64% health posts received feedback from supervisors during past 3 months but not on HMIS data quality and information use.

4. 2.3.3.2. Promotion of a Culture of Information

During pre-intervention assessment of this project, the promotion of culture of information was assessed by looking at different activities of the Begi woreda health office such as giving directives on how to use HMIS information as well as on establishment and functionality of Performance Monitoring Team at all health facilities.

The results showed that no directives were given on use of HMIS information from District to facilities during past three months. The results also indicated that HIT at Health Centers did not attend performance review meetings at the woreda health office level for discussing health service performance although such performance review meetings provide an opportunity which could foster interest of using HMIS information and leading to improved HMIS performance.

In terms of establishing Performance Monitoring Teams at health facilities, only two of the health centers among five health centers have PMTs and out of them one health center was maintaining the meeting minute of past three months. In one health center that was maintaining the meeting minute, HMIS information was not discussed in the last three months and had no evidence of making decisions using HMIS data.

4. 2.3.3.3. Availability of HMIS Resources

The pre-intervention assessment of this project looked at the availability of resources necessary for better HMIS performance such as calculator at health post, computer, printer, electricity and internet connection. Among 14 health posts surveyed none of them even have calculators. Among five health centers surveyed only two of them have even one computer. Out of those two health centers only one health center has printer. A telephone line is there only at one health center. Both woreda health office and health facilities haven't internet connection. At District level, WorHO have three computers and two printers. These resources can be considered as contributing factors for ensuring better HMIS performance. For instance, the low score of HEWs' ability (competency of HEWs in HMIS task) to calculate percentage of basic indicators data and high data inaccuracy can be the effect of an absence of calculators at the health posts level. It is equally important to deal that electric power supply is necessary for better HMIS performance. Among five Health centers surveyed only two HCs have access to electric power supply through the regular supply.

4.3. Interventions and strategy

4.3.1. Strategy

4.3.1.1. Establishing HMIS Performance Improvement Team

This was crucial for success of the project because culture of information that is ensured by promoting values and beliefs for collection, aggregation, transmission, analysis and use of health information for evidence based decision making is an element of organizational culture and can be strengthened if all staffs at each level of health system are involved. Therefore, involved members in HMIS performance improvement team include vice head of Begi WorHO, process owner of each program and HMIS focal person at all levels. Establishment of the team was aimed at initiating higher management of Begi WorHO and making them active participant of this project.

4.3.2. Interventions

Interventions made by the project for improving HMIS data quality and information use practice in case of Begi District comprise discussion and preparing action plan for the interventional activities with management team of the WorHO, on-job training, supportive supervision, data audit as well as performance review meeting.

4.3.2.1. Discussing with management team of Begi WorHO on improvement intervention of this project

Presenting the findings of pre-intervention assessment of this project and discussing with management team of Begi WorHO on the identified gaps and proposed solutions. In addition, briefing all staffs of the WorHO about concepts/definition and purposes of HIS, HMIS, and CHIS as well as on the methods of data quality check and purpose of information use for two days in order to increase their awareness and motivation. 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 was increased.

4.3.2.2. On the Job Training

The training principally involved the managers of health facilities as well as health information technician and one health professional from MCH of each health facility and two experts of planning and budgeting team from the District who were responsible for HMIS performance.

The total number of participants involved was thirteen (13) health staffs of Begi District. This on- job training was intended to help the participants as they appreciate that high-quality data and continuous information use are essential for improving performance of health service delivery which ultimately improves health status of the community served. This training was also intended to initiate the trainees as they acknowledge the broader context in which the routine HMIS operate. Pre and post test were given and the trainee's awareness and knowledge was found increased as identified by post training test.

To meet the intentions of the training, addressed areas were generally provided as follow:

- Concept/definition and purpose of HIS, HMIS, and CHIS for performance management
- Key concepts and purpose of information use and its relation with efforts of strengthening M&E capacity
- Meaning of data quality and how it can be assured
- HMIS indicators used to improve M&E of health program in Ethiopia.
- Methods of data analysis and information use for local evidence based decision making

Training agenda

The training agenda comprises session contents/objectives; activities, responsible persons and how each session was organized have been provided by the following table:

Session	**Objectives** *By the end of the session, the trainees are able to:*	**Activities**	**Responsible body**
Session 1: Welcome and Introduction to the Training	- Explain objectives of the training - Relate the training objectives with their work - Establish network among trainees	-Welcoming speech - Trainees' discussion - Pre-test	PM and HMIS performance improvement team
Session 2: concepts/	-The concepts, roles and functions	-Brainstorming	PM and

Session	Objectives *By the end of the session, the trainees are able to:*	Activities	Responsible body
definitions and purposes of HIS, HMIS and CHIS for performance management	of HIS in the context of the health system building blocks, - Understand and explain about reports generated by HMIS, about HMIS indicators and their importance and about the types of indicators used for information use at each level of the health system	-Group work -Group discussion -Brief lecture	HMIS performance improvement team
Session 3: Performance of HMIS and its determinants and relationship of HMIS indicators with Health Programs	-Define data quality -Understand the application of data quality assurance tools. -Discuss how HMIS is used for monitoring program performance and strategy implementation	-Group exercise on case study -Individual exercise -Review of concepts	PM and HMIS performance improvement team
Session 4: Decision Making in the context of Performance Improvement	-Describe purpose, mission and vision of Ethiopian health system -Describe the see-plan-do cycle -Analyze, interpret and present health data in the context of using HMIS data for decision-making	-Exercise on root cause analysis using Fishbone and decision tree; -Exercise on ranking matrix to	PM and HMIS performance improvement

Session	Objectives *By the end of the session, the trainees are able to:*	Activities	Responsible body
	-Apply various techniques of root cause analysis, generating interventions and prioritization	prioritize root causes; -Exercise on evaluation criteria to prioritize interventions and - exercise on how to develop implementation plan	team
Session 5: Sustaining a Culture of Information Use	-Define culture of information use. -Describe different information dissemination means -Describe the factors affecting culture of information use -Develop action plan for sustaining the culture of information use.	Debate on sustaining culture of HMIS information use. -Post test	PM and HMIS performance improvement team

4.3.2.3. Supportive Supervision

Developing supervisory checklists for supportive supervisory visits aimed at attaining the improvement of HMIS data quality and information use practices at both administrative health units. This was essential part of HMIS performance improvement interventions during the project execution. There was a need for strengthening supportive supervisions for achieving the objective of this project because supportive supervisions are a means of sharing experience for the staffs and providing action-oriented feedback to lower level health facility focusing on the HMIS data quality and information use practices.

By taking the importance of supportive supervisions in to an account especially for motivating health workers to improve HMIS data quality and information use, the following activities were conducted:

- Developing supervisory check lists for supportive supervisions aimed at attaining improvement of HMIS performance and integrated it with regular process (see Annex 4).
- Conducting supportive supervision at all the PHCU from March 15 to April 20/2015 G.C
- Explaining strengths and weakness of the collected and reported data

4.3.2.4. Data audit

Facility check list adopted from PRISM toolset was used for assessing accuracy of data, completeness and timeliness of monthly HMIS data reporting at health facility level during the data audit. The data audit was conducted by PM and HMIS performance improvement team using seven data elements collected from health facility's registries covering 21 March to 20 April/2014 G.C. Then performance review meeting was held aimed at assuring result-based monitoring of data quality and information use practice. During the meeting, HMIS performance improvement team has actively discussed on the facility's performance emphasizing the accuracy, completeness and timeliness of HMIS data reporting and utilization of information. After the data audit and performance review meeting, PM provided each facility with action-oriented feedback on its data quality.

4.4. Post-interventions assessment results

4.4.1 HMIS data accuracy at health facilities level

The findings of post-intervention assessment of this project showed that the data elements which completely matched between what is in registers and what is in reporting forms at health facilities level was increased from 65% before to about 87% in overall selected cases during 21/07/2014 – 20/08/2014 G.C after intervention (Table 8).

Table 8: HMIS data accuracy at health facility level before and after intervention

	Facility type Health posts (n=14) Health centers (n=5)	**% of data accuracy before intervention**	**%of data accuracy after intervention**
For all cases of the seven selected data elements	Health posts	74	82
	Health centers	61	91
	All Health facilities	**65**	**87**

4.4.2. HMIS report completeness at health facilities

4.4.2.1 HMIS report data completeness

The results of post-intervention assessment of this project showed that the health facilities (health centers and health posts) those reported all the HMIS data elements filled against the total number of HMIS data elements which the health facility was supposed to fill were increased from 42% before to 100% after intervention (Table 9).

Table 9: HMIS monthly reports' data completeness at woreda health office level before and after intervention

Facility type	Number of facility by type	% of HF reported complete Monthly HMIS data before intervention	% of HF reported complete Monthly HMIS data after intervention
Health posts	14	36	100
Health centers	5	60	100
All Health facilities	**19**	**42**	**100**

In addition, the findings of post intervention assessment of this project also showed that 100% of the health facilities that were supposed to report were made to be actually reporting to the next higher health office which was 96% before intervention (Table 10).

Table 10: Health Facility's Monthly Reporting Completeness before and after intervention

Woreda	% of HFs actually reporting to WorHO before intervention	% of HFs actually reporting to WorHO after intervention
Beghi WorHO	**96**	**100**

4.4.3. Timeliness of HMIS reporting

Concerning timeliness of HMIS monthly reporting, the pre intervention assessment identified two problems. These were:

- At each administrative unit, the HMIS Focal Person did not keep record of receipt and transmission of the monthly report from and to the respective health unit level and
- Only 89% of the health facilities found reporting within the predetermined reporting deadline as identified from date monthly report.

As identified by post intervention assessment, interventional activities of this project solve this problem and timeliness of HMIS reporting was improved from 89% before to 100% after intervention.

4.4.4. Data quality check

Out of supervised Health Posts and Health Centers (79% and 100% respectively), in none of them the supervisors had carried out data quality check before intervention. Interventional activities of this project made possible the data quality check to be carried out at two health centers and their corresponding community health posts. In addition, best practice sharing on data audit was conducted by two trained HIT.

4.4.5. HMIS Information Usage practices

4.4.5.1. Data display

Displaying data by chart and/or graphs on such indicators as maternal health, neonatal and child health, malaria, Quality of health service (*Proportion of bed occupancy, OPD attendance per capita, customer satisfaction index*), hygiene and environmental Sanitation and nutrition was ensured at all health centers. As identified by the post intervention assessment, interventional activities of this project paved the way of using data to identify gaps and setting targets as well as to make decisions and provide feedback in view of local action-oriented performance monitoring.

4.4.5.2 HMIS data analysis

The pre intervention assessment of this project identified that HMIS data analysis at health facility level particularly at health center was conducted only in terms of generating monthly summary report for woreda health office. More or less this project by its interventional activities enables all health centers of Begi woreda to conduct data analysis in terms of carrying out comparison of HMIS data over quarter, Comparison among service coverage by types and Comparison among facility's catchment areas. In addition, particular gap identified on Comparison of service coverage by types and with zone target at the woreda health office level before intervention was addressed after intervention.

4.4.6. Organizational Determinants

4.4.6.1. Supervision quality

As identified by pre-intervention assessment, out of health facilities received supervisory visits in none of them HMIS data quality check was carried out. Thus, supervisory check list particularly on HMIS data quality check and information use practice was developed with involvement of HMIS performance improvement team established by this project and integrated it in to regular supervisory visits. This was aimed to pave the way for providing action-oriented feedback on HMIS data quality and information use by higher level to lower level administrative units.

4.4.6.2 Promotion of information culture

In terms of promoting culture of information, this project ensured Performance Review Teams to be established at all Health centers which was only at two health centers of the woreda before intervention as to give directive on HMIS information use in preparing local action plan, sharing best practice of information use and provide feedback.

4.5. Discussion

Accurate, complete and timely health information on service delivery and other key indicators are crucial for health mangers at each management spiral for decision making to reach more people with better quality health services. 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 (19). Unfortunately, in Begi district health sector, routine Health Management Information System (HMIS) was unable to provide the better quality data and information support needed before interventions. The generated data were of low quality and 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 65% to 87% and the level of data completeness has been increased from 42% before to 100% after the intervention in Begi district health sector. In addition, after intervention 100% of the health facilities that were supposed to report were made to be actually reporting to the next higher level which was 96% before intervention. As shown by baseline assessments conducted on status of routine HMIS performance in Cote d'Ivoire, averagely data accuracy level in health facilities was 55%. Between 2008 and 2012, data accuracy improved in Cote d'Ivoire by 17% at health facilities and doubled (from 40% to 81%) at district level (18). Assessment undertaken at Guanajuato State, Mexico, in January 2010 showed that completeness for filling the monthly report at the facility level was only 22% while at the district level it was found to be 100% for three districts; five other districts had no data on completeness

There were two identified problems concerning timeliness of HMIS reporting: absence of record keeping as to measure timeliness of HMIS monthly reporting, and only 89% of the health facilities found reporting within the predetermined reporting deadline before intervention. These two problems were addressed after intervention and thus, keeping records of HMIS monthly reporting both at health centers and WorHO was ensured. Timeliness of HMIS reporting was improved from 89% before to 100% after intervention. Similarly, assessment of HMIS performance conducted in SNNPR of Ethiopia by MEASURE EVALUATION in collaboration with Regional health bureau showed that data accuracy level found very low at health facilities

except hospitals, but data completeness and timeliness of facility reports were found relatively good (12).

As a result of the interventional activities of this project, data quality check was made to be conducted at two health centers and their corresponding health posts after interventions which were conducted at none of health centers and health posts before interventions. Similarly, assessment of HMIS performance conducted in SNNPR of Ethiopia by MEASURE EVALUATION in collaboration with Regional health bureau showed that in 64% of the supervised Health Facilities (primarily HCs and HPs), the supervisors had carried out data quality check (12).

Another dimension of HMIS performance was information use practice which was important area of HMIS data quality and information use improvement intervention of this project. Poor practice of displaying HMIS data by table, chart or graphs as well as HMIS data analysis by carrying out comparison of HMIS data over months/quarters, Comparison among service coverage by types and Comparison among facility's catchment areas were identified before intervention. Such Poor practices was improved at all health centers after interventional activities of this project as to pave the way of using HMIS data for identifying gaps and setting targets as well as to make decisions and provide feedback in view of local action-oriented performance monitoring in case of Begi District.

In terms of establishing Performance Monitoring Teams, this project ensured Performance Monitoring teams to be established at all Health centers which was only at two health centers of the woreda before interventions and increase awareness of keeping the meetings minutes for further reference to follow up the meetings decisions and give feedback on its implementation.

In view of the fact that since culture of information use is a subset of organizational culture, it can be strengthened if all people within an organization are participated and that is why HMIS performance Improvement Team was established as main strategy of interventional activities of this project. It was assumed that culture of information use affect staff's self-efficacy level for HMIS tasks. As other part of interventional activities of this project, data audit and performance review meeting was conducted with active participation of HMIS performance Improvement 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.

Behavioral determinants of HMIS performance which include health professionals' confidence for HMIS task, competence in HMIS task, Knowledge on rationale of HMIS data collection and method of data quality check were assessed during pre-intervention assessment. The result showed that respondents felt less confident in checking HMIS data quality than calculating, plotting, and using of HMIS data. The result also showed that although they had relatively higher confidence level for the HMIS tasks except checking HMIS data quality, health professionals' skill for analyzing, interpreting and using HMIS data as well as their knowledge on rationale of data collection and on method of checking data quality was found to be lower. These gaps were beyond this project due to budget and time limitation as well as limitation of project manager experience. Thus, requires further integrated improvement interventions.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1. Conclusion

This project was executed with the aim of HMIS data quality and information use improvement in the case of Begi District through baseline assessment of HMIS performance and its determinants categorized under technical, behavioral and organizational factors. It comes up with HMIS data quality and information use improvement interventions intended to address the identified barriers in the Begi District case.

The practical, strategic and simple interventional activities of this project on HMIS data quality and information use practice more or less increased the accuracy, completeness and timeliness of HMIS data reporting that paved the way for continuous information use in Begi woreda. The HMIS data quality and information use improvement intervention that involved specific on-job training, supportive supervisions, data audits as well as performance review meeting was found to be effective in increasing the accuracy, completeness and timeliness of HMIS data leading to continuous information use for local action-oriented performance review.

The Health Management Information System (HMIS) in Ethiopia is designed to capture and provide essential core data for planning and management purpose with the view to enhance the HMIS information use at each level of the health system. On the other hand, the purpose of HMIS is to routinely produce better quality health information that provides specific information support to the decision-making process at each level of the health system for improving the performance of health services delivery and eventually leads to improved health status of the community served. However, in reality the situation was far from this in case of Begi woreda before interventional activities of this project. This was due to Poor commitment from woreda management for better quality HMIS data and local continuous information use, lack of due attention given to knowledge and skills for HMIS data processing, analyzing, interpretation and use, and poor supportive supervision for improving HMIS performance as some contributing factors for poor performance of HMIS in Begi District.

During improvement intervention of this project, specific on-job training on *concept, definition and purpose of HIS, HMIS and CHIS as well as HMIS data quality and its relations with health program, decision making in the context of local performance improvement, and sustaining a culture of information use* was given. Supportive supervisory visits, data audit and performance review meeting were carried out with active participation of HMIS performance improvement

team and an encouraging result was achieved on HMIS performance. Although it requires further research for formal costing analysis, these interventional activities are likely to be a relatively inexpensive way of improving HMIS data quality and information use in resource-poor settings**.**

5.2. RECOMMENDATION

Based on the findings of the project, the following recommendations were made to Begi woreda health office and all concerned stakeholders of HMIS.

- Improve supportive supervision and action-oriented feedback practice which focus on checking and ensuring HMIS data quality as well as use of HMIS information for identifying gaps, setting targets, making decision and provide feedback for internal management.
- Promoting a culture of information through giving directives on how to use HMIS information as well as providing feedback based on HMIS information.
- West Wollaga zonal Health Department and all stakeholders should work together in order to conduct further assessment on HMIS data quality and information use practice within the zone.
- Begi woreda and concerned bodies should give well organized on the job training on HMIS performance and its determinants.
- Further research for analyzing cost and effectiveness of similar interventions as well as to see association between better performed HMIS process and improved performance of health service delivery.

References

1. Alganesh G/H. Assessment of health management information system. Addis Ababa: Addis Ababa University; 2005.

2. Theo L, Rainer S, Claude B. Design and implementation of health information systems. Geneva: World Health Organization; 2000

3. Federal Ministry of Health. Health Sector Development Program-IV. Addis Ababa: FMoH; 2010.

4. Federal Ministry of Health. Health Management Information System (HMIS) / Monitoring and Evaluation (M&E): Strategic Plan for Ethiopian Health Sector. Addis Ababa: HMIS Reform Team; 2008.

5. Kidane T, Ejigu G, Girma T. Assessment of Health Management Information System Implementation in Ayder Referral Hospital. Mekelle,: Ethiopia. *International Journal of Intelligent Information Systems.* 2014. doi: 10.11648/j.ijiis.2014,0304.11

6. William S. Fundamentals of strategic planning for health care organization. Geneva: WHO, 1997.

7. Washer U. Information System in district health system.1995 Online available at http//www.washer/uwe/DIPLOM/dip0.htm.accessed 20 october 2009

8. Jørn B, Arthur H, Sundeep S. Improving quality and use of data through data-use workshops. Zanzibar: Oslo University of Oslo; 2012.

9.Vincent M K, Joseph KB M, Fredrick M. Strengthening district-based health reporting through the district health management information software system: the Ugandan experience. Kampala: Biomedical Center; 2014.

10. Ethiopian Federal Ministry of Health, WHO. Assessment of Ethiopian national Health information system. Addis Ababa: Central Statistics Agency (CSA) and the Health Metrics Network (HMN); 2007.

11. Jim H, Country health information system: A review of the current situation and trends, Switzerland: WHO; 2011.

12. Hiwot B, Tariq A, Hailemariam K. Assessment of Health Management Information System (HMIS) Performance in SNNPR. Ethiopia: SNNP Regional Health Bureau; 2014.

13. *Leso, Matius,* GDDS Health project documentation. Tanzania: HMN; *2009.*

14. Federal Ministry of Health. HMIS / M&E Redesign: Technical Standards: Area 1 version 1.0. HMIS / M&E Indicator Definitions. Addis Ababa: HMIS Reform Team; 2007.

15. Anwer Al, Theo L, Traore M. PRISM Tools User Guide. North Carolina: MEASURE Evaluation/JSI; 2009.

16. Federal Democratic Republic of Ethiopia, Ministry of Health. HMIS Information Use Guide: Technical Standards Area 4: Version 2. Addis Ababa: Ministry of Health; 2013.

17. Mphatswe W, Mate KS, Bennett B, Improving public health information: a data quality intervention in KwaZulu-Natal. South Africa: Bulletin of WHO; 2012.

18. Hiwot B, Theo L. Inventory of PRISM Framework and Tools: Application of PRISM Tools and Interventions for Strengthening Routine Health Information System Performance. 2013,p6-14.

19. Paul K, Determinants of use of information in Nathenje health area of Lolingwe District. a dissertation for the requirement of master of public health degree; 2011.

20. Aqil A, et al, Assessment of the national health information system in Gaunajuato state of mexico; 2010.

21. Mavimbe JC, Braa J, Bjune G. Assessing immunization data quality from routine reports in Mozambique.BMC public health; 2005.

22. MEASURE EVALUATION, USAID, RHINO. Measuring and Improving RHIS Performance, Guanajuato. Mexico: MEASURE EVALUATION; 2010, P36 - 37.

23. Sultan Abajebel, Challi Jira, Waju Beyene. Utilization of health information system at district level. Jimma: Jimma University; 2011.

7. ANNEX

7.1. Annex One: Data collection tools

7.1.1. Woreda level HMIS Performance Diagnostic Tool

Introduction

This Assessment is part of Beghi District health office's efforts under West Wollaga Zonal Health Department, Oromia Regional Health Bureau to improve Performance of Health management information system in the District. The objective of this Assessment is to help formulate and implement interventions for improving Performance of Health management information system producing better quality Data and continuous use of information within Beghi District. Please express your opinion honestly. Your responses will remain confidential and will not be shared with anyone. Results will be aggregated and presented in a table form and cannot be linked back to individuals. I appreciate your assistance and cooperation in completing this project study.

Thank you.

Instructions for Filling out the HMIS Performance Diagnostic Tool: Data Quality at the Woreda Health Office Level

Section I: Identification

HMIS PERFORMANCE DIAGNOSTIC TOOL

Quality of Data Assessment: Woreda Health Office Form

Name of the District: _____

Name of assessor: _____

Name & Title of Person Interviewed: _____

Date of Assessment: _____

Section II: Data Completeness and Transmission					
1	Does the district health office keep copies of HMIS monthly reports sent by health centers?			1.yes	0.No
2	What is the number of health facilities in the district that are supposed to be reporting to (enrolled in) routine HMIS?				
3	What is the number of health facilities in the district that are actually reporting to (enrolled in) routine HMIS?				
4	**Count** the number of monthly reports submitted by the health centers for any two months (of the surveyor's choosing)		a. Month		b. Month
			August/2006EFY		December/2007EFY
5	What is the deadline for the submission of the routine HMIS monthly report by facilities?				
6	Does the district health office record receipt dates of routine HMIS monthly reports?		1.Yes	0.No	If receipt dates are not recorded, go to Q8
7	If Q6 is yes, check the date of receipt for the two months to answer Q7 (the total number of reports received before and after the deadline should be the same as in Q4).				
	Item	a. Month: **August/2007 EFY**		b. Month: **December/2007EFY**	
		1.Before Deadline	2.AfterDeadline	3.Before Deadline	4. After Dead line
	Number of facilities				
8	**Observe:** Does the district have a record of people who receive monthly report data by a certain deadline after receiving the monthly reports			1.Yes	0.No

	from the facilities?		
9	Observe: Does the district have a record of submitting data on time to Zonal Health Department levels?	1.Yes	0.No

Section III: Data Accuracy Check

10	Manually count the number of the following data items from the routine HMIS monthly reports for the two months. Compare the figures with the reports from the computer or paper database.				
	Data items	**Month**: August/2006EFY		**Month:** December/2007EFY	
		Manual count	Computer or paper database	Manual count	Computer or paper Database
10.a	Number of repeat contraceptive acceptors				
10.b	Number of pregnant women that received ANC at least four visits				
10.c	Number of birth attended by skilled professional				
10.d	Malaria (confirmed with P. falciparum) for female under five years of age				
10.e	OPD attendance of female 15 years & above				
10.f	Clients (20-24 years :female) receiving HIV test results (at VCT)				

10.g	Number of children under one year of age who have received measles vaccine				
Section IV: Data Processing and Analysis					
11	Does a database exist to enter and process data?	0.No	1. Yes, by Manual	2.Yes,by computer	
12	Does the database produce the following?				
12.a	Calculate indicators for each facility catchment			1.Yes	0.No
12.b	Data summary report for the district			1.Yes	0.No
12.c	Comparisons among facilities			1.Yes	0.No
12.d	Comparisons with district targets			1.Yes	0.No
12.e	Comparisons among types of services coverage			1.Yes	0.No
12.f	Comparisons of data over time (monitoring over time)			1.Yes	0.No
Instructions for Filling in the Diagnostic Tool: Use of Information at District Level **Section I: Routine HMIS Report Production**					
13	Does this district health office compile HMIS data submitted by Health centers?			1.Yes	0. No
14	Does the district health office issue any reports containing HMIS information?	1.Yes	0.No	If no, go to section II	
15	If yes, please list reports that contain data/information generated through HMIS. Please indicate frequency of reports and the number of times the report was actually issued for the last 12 months. Please confirm the issuance of the report by counting them.				

	Title of the report	No. of times this report is supposed to be issued per year	No. of times that reports are actually issued for the last 12 months	
15.1	Monthly			
15.2	Quarterly			
15.3	Annual			
15.4				
15.5				
16	Did the district office send a feedback report (using HMIS information) to facilities during the last three months?		1.Yes	0.No

Section II: Display of Information at District Health Office

17	Does the district health office display the following data? Please indicate the types of data displayed and whether the data are updated for the last reporting period. (If no, go to Q18)				
	Indicator	Type of display (Please tick)		Updated	
17.1	Related to mother health	Table		1.Yes	0.No
		Graph/Chart			
		Map			
17.2	Related to child health	Table		1.Yes	0.No
		Graph/Chart			
		Map			
17.3	Related to regulatory process	Table		1.Yes	0.No
		Graph/Chart			

		Map			
17.4	Disease surveillance	Table		1.Yes	0.No
		Graph/Chart			
		Map			
18	Does the office have a map of the catchment area?			1.Yes	0.No
19	Does the office display a summary of demographic information, such as population by target group?			1.Yes	0.No
Section III: Use of Information in Available Reports at District health office					
20	Is feedback quarterly, yearly or any other report on routine HMIS data available, which provides guidelines/ recommendations for actions? (If no go to Q24)			1.Yes	0.No
21	If you answered yes to question Q20, what kinds of decisions are made in the reports of Routine HMIS data/Information for actions (based on HMIS data)? Please check boxes accordingly.				
	Types of decisions based on types of analyses				
21.1	Appreciation and acknowledgement based on Number/percentage of facilities showing performance within control limits over time (month to month comparisons)			1.Yes	0.No
21.2	Mobilization/shifting of resources based on comparison by facilities			1.Yes	0.No
21.3	Advocacy for more resources by comparing performance by areas(health centers, health post), human resources and logistics			1.Yes	0.No
Section IV: Discussion and Decisions about Use of Information					
22	Does the district health office have routine meetings for reviewing			1.Yes	0.No

	managerial or administrative matters?		
23	How frequently is the meeting supposed to take place? Circle the appropriate answer. 4. Weekly, 3. Every two weeks, 2. Monthly, 1. Quarterly, 0. no schedule		
24	How many times did the meeting take place during the last three months? Circle the appropriate. **12** times, **6** times, **3** times, **1** times, none		
25	Is an official record of management meetings maintained? (Section V)	1.Yes	0.No
26	If yes, please check the meeting records for the last three months to see if the following topics were discussed:		
26.1	Discussion about HMIS findings such as patient utilization, disease data, service coverage, medicine stock out, etc.	1.Yes, observed	0.No
26.2	Have they made any decisions based on the above discussions?	1.Yes, observed	0.No
26.3	Has any follow-up action taken place on the decisions made during the previous meetings?	1.Yes, observed	0.No
Section V: Promotion of Use of Routine HMIS Information at District Health office Level			
27	Did district health office's annual action plan show decisions were made based on HMIS information?	1.Yes	0.No
28	Did district health office's records from previous three months show that district's management directives were based on use of information?	1.Yes	0.No
29	Does the office have documentation showing that RHMIS information is used for advocacy?	1.Yes	0.No
30	Do district staff meeting records show that people in charge of health centers attended meetings that focus on RHMIS performance at their facilities?	1.Yes	0.No
31	Please give examples of how the district office uses RHIS information for health system management. 0. No examples 1. Yes (details follows)		

7.1.2. Facility level HMIS Performance Diagnostic Tool

Introduction

This Assessment is part of Beghi District health office's efforts under West Wollaga Zonal Health Department, Oromia Regional Health Bureau to improve Performance of Health management information system in the District. The objective of this Assessment is to help formulate and implement interventions for improving Performance of Health management information system producing better quality Data and continuous use of information within Beghi District. Please express your opinion honestly. Your responses will remain confidential and will not be shared with anyone. Results will be aggregated and presented in a table form and cannot be linked back to individuals. I appreciate your assistance and cooperation in completing this project study.

Thank you.

Instructions for Filling out the HMIS Performance Diagnostic Tool: Data Quality at the Facility Level

Section I: Identification

1. **HMIS PERFORMANCE DIAGNOSTIC TOOL**

Data Quality Assessment: Health Facility Form

Woreda: _____

Name of assessor: _____

Name & Title of Person Interviewed: _____

Facility Type: _____

Date of Assessment: _____

Section II: Data Recording

1. Does this facility keep copies of the Routine HMIS quarter reports, which are sent to the next higher level?

1. Yes 0. No, if no, go to Q3

2. Count the number of Routine HMIS quarter reports that have been kept at the facility for the last twelve months.

3. Does this facility keep registration book of different department? 1. Yes, 0. No, if no, go to Q5

Section III: Data Accuracy Check					
4	If yes to Q3, find the following information in the registration books of different departments for the selected two months. If the facility does not keep copies of the monthly report, obtain copies at the next higher level and complete the				
	Data Items	**Month:** August/2007EFY		**Month:** December/2007EFY	
		# from Registration book	# from Report	# from Registration book	# from Report
4.a	Number of repeat contraceptive acceptors				
4.b	Number of pregnant women that received ANC at least four visits				
4.c	Number of birth attended by skilled professional				
4.d	Malaria (confirmed with P. falciparum) for female under five years of age				

4.e	OPD attendance of female 15 years & above				
4.f	Clients (20-24 years :female) receiving HIV test results (at VCT)				
4.g	Number of children under one year of age who have received measles vaccine				
Section IV: Routine HMIS Processes					
5	**Did you receive a directive from the Woreda health office's management to:**				
5.1	Check the data accuracy at least once in three months?			1.Yes	0. No
5.2	Fill the monthly report form completely			1.Yes	0. No
5.3	Submit report by declared deadline			1.Yes	0. No
6	**Did you receive a directive from the Woreda health office's management that there will be consequences:**				
6.1	if you do not check the data accuracy			1.Yes	0. No
6.2	If you do not fill the monthly reporting form completely			1.Yes	0. No
6.3	If you do not submit the monthly report by declared deadline			1.Yes	0. No

Section IV: Data Completeness		
7	How many data items does the facility need to report on the Routine HMIS monthly report? This number does not include data items for services not provided by this health facility.	
8	Count the number of data items that are supposed to be filled in by this facility but left blank without indicating "0" in the selected month's report.	

Section V: Data Processing and Analysis

Data Transmission /Data Processing/Analysis			
9	Do data processing procedures or a tally sheet exist?	1.Yes, Observed	0. No
10	Does the facility produce the following:		
10.a	Calculate indicators for each facility catchment area		
10 b	Comparisons with district or national targets		
10.c	Comparisons among types of service coverage		
10.d	Comparisons of data over time (monitoring over time)		

Instructions for Completing the Diagnostic Tool: Use of Information at the Facility Level

Section I: HMIS Report Production			
1	Does this facility compile RHIS data?	1.Yes	0.No
2	Does the facility compile any reports containing HMIS information? (If no, go to Q4)	1.Yes	0.No

Section II: Frequency and Type of Produced HMIS Reports			
3	If response to Q2 is yes, please list all reports that contain data/information generated through the HMIS. Please indicate the frequency of these reports and the number of times the reports actually were issued during the last 12 months. Please confirm the issuance of the report by visually observing it.		
	Title of the report	No. of times this report is supposed to be	No. of times this report actually has been issued
3.1	Monthly Report		
3.2	Quarterly Report		
3.2	Annual Report		

4	During the last three months, did the higher level management send a feedback report to the facility using routine HMIS information?			1.YES	0. NO
Section III: Display of Information in the Facility					
5	Does the facility display the following data? Please indicate types of data displayed and whether the data have been updated for the last reporting period. If no go to Section IV				
	Indicators	Type of display (Please tick)		Updated	
5.1	Related to maternal health	Table		1.Yes	0.No
		Graph/Chart			
		Map/other			
5.2	Related to child health	Table		1.Yes	0.No
		Graph/Chart			
		Map/other			
5.3	Disease surveillance	Table		1.Yes	0.No
		Graph/Chart			
		Map/other			
Section IV: Use of Information in Available Reports at Facility					
6	Is feedback, quarterly, yearly or any other report on routine HMIS data available, which provides guidelines/ recommendations for actions? (If no go to Section V)			1.Yes	0.No
7	If you answered yes to question Q6, what kinds of action-oriented decisions have been made in the reports (based on routine MHIS data)? Please check boxes accordingly.				
	Types of decisions based on types of analyses				

7.1	Review strategy by examining service performance target and actual performance on month to month comparisons	1.Yes	0.No
7.2	Review facility personnel responsibilities by examining service target and actual performance on month to month comparison	1.Yes	0.No
7.3	Mobilization of resources based on comparison by services	1.Yes	0.No
7.4	Advocacy for more resources by comparing performance by targets and showing gaps	1.Yes	0.No
Section V: Discussion and Decisions on Use of Information at the Facility Level			
8	Does the facility have routine meetings for reviewing managerial or administrative matters? (If no, go to Q12)	1.Yes	0.No
9	How frequently is the meeting supposed to take place? 4. Weekly; 3. After every two weeks; 2. Monthly; 1. quarterly		
10	How many times did the meeting take place during the last three months? **12.** 12 times or more; **4.** 4 times; **2.** 2 times; **0**. None		
11	Is an official record of management meetings maintained? If no, go to Section VI	1.Yes	0.No
12	If yes, please check the meeting records for the **last three months** to see if the following topics were discussed:		
12.1	Discussion on routine HMIS findings such as service utilization, disease data, or service coverage & etc.	1.Yes, observed	0. No
12.2	Have they made any decisions based on the above discussions?	1.Yes, observed	0. No

12.3	Has any follow-up action taken place on the decisions made during the previous meetings?	1.Yes, observed	0. No
Section VI: Promoting Routine HMIS Information Use at the Facility Level			
13	Did the Facility records for the last three months show that HC/woreda/Zonal issued directives concerning the use of information	1.Yes	0.No
14	Did the person in charge of the Facility participate in meetings at the HC/District level to discuss Routine HMIS performance over the last three months?	1.Yes	0.No
Section VII: Supervision by the Health center/District/Zonal level			
15	How many times did the Health center/District level supervisor visit your facility during the last three months? (check the answer) (If zero, go to Q17)	1 2 3	4
16	Did the supervisor check the data quality?	1.Yes	0.No
17	Did the supervisor send a report/feedback/note on the last two supervisory visits?	1.Yes	0.No

7.2. Self-administered Questionnaire

7.2.1. The routine HMIS Organizational and Behavioral Assessment Tool (OBAT)

Introduction

This Assessment is part of Beghi District health office's efforts under West Wollaga Zonal Health Department, Oromia Regional Health Bureau to improve Performance of Health management information system in the District. The objective of this Assessment is to help formulate and implement interventions for improving Performance of Health management information system producing better quality Data and continuous use of information within Beghi District. Please express your opinion honestly. Your responses will remain confidential and will not be shared with anyone. Results will be aggregated and presented in a table form and cannot be linked back to individuals. I appreciate your assistance and cooperation in completing this project study.

Thank you.

Instruction for completing the OBAT

To be filled by staffs and management at Woreda Health Office/Health center level

Facility Type: _____

Date of Assessment: _____

Name of assessor: _____

Name & Title of Person Interviewed: _____

Age *(Write in your age (number of years)*: _____Years

Sex (*Circle the appropriate answer): **1. Male** **2. Female***

Educational Level (*Circle the appropriate answer):* **1. $10^{+3,}$ 2. Bachelor, 3. Master, 4. Medical Doctor, 5. Specialist**

Years of employment (*Write in years. If 1 or less than 1 year, writes' 1'*): _____Years

SELF-EFFICACY FOR HMIS TASKS

This part of the questionnaire is about your confidence level in performing tasks related to health management information systems. High confidence indicates that you can perform the task, while low confidence means room for improvement or training. I am interested in knowing how confident you feel in performing HMIS-related tasks. Please be frank and rate your confidence honestly.

On a scale of 0 to 100%, please rate your confidence level in accomplishing the following HMIS activities. (For example, if you are very confident select 100%)

Rate your confidence for each situation according to a percentage from the following scale:

0 10 20 30 40 50 60 70 80 90 100 (Please tick your Confidence)

S/N	**SELF-EFFICACY**	**Rating scale**										
		0	10	20	30	40	50	60	70	80	90	100
SE1	I can check data accuracy											
SE2	I can calculate percentages/rates correctly											
SE3	I can plot data by months or years											
SE4	I can compute trends from bar charts											
SE5	I can explain findings & their implications											
SE6	I can use data for identifying gaps and setting targets											
SE7	I can use data for making various types of decisions and providing feedback											

Task-competency in HMIS tasks

Please solve the following problems about calculating percentages, rates, and plotting and interpreting information.

Competency 1. The estimated number of pregnant mothers is 340. Antenatal clinics have registered 170 pregnant mothers. What percent of pregnant mothers are attending antenatal clinics?

Competency 2. The full immunization coverage for 12-23 month-old children was found to be 60%, 50%, 30%, 40%, 40% for years 1997, 1998, 1999, 2000, and 2001, respectively.

Competency 2.a: Draw a bar chart for coverage percentages by years

Competency 2.b: Explain the findings of the bar chart

Competency 2.c: Did you find a trend in the data? Explain your answer

Competency 2.d: Provide at least one use of above chart findings at:

1. Hospital level

2. District/Zonal level

3. Policy level

4. Community level

Competency *3.* A Beghi town has 5,000 children who are under five-years-old. A survey found that 500 children (under five years-old) in this town were malnourished. What is the malnutrition rate for children under five years old in this town?

Competency 4. If the malnutrition rate in children less than 2-years-old is 20% and the total number of children who are less than 2-years-old is 10,000, how many children are malnourished?

Test of Knowledge of rationale for data collection

1. Describe at least three reasons why for collecting data on monthly basis on the following:

1A: Diseases

1.

2.

3.

1B: Immunization

1.

2.

3.

1C: Why does the target area need population data?

1.

2.

3.

Test of Knowledge on Methods for Checking Data Quality

2. Describe at least three ways of checking data quality.

1.

2.

3.

Problem solving skill

Ato Robsan, head of Woreda health office, read a recent district report which showed that the data quality was 40%. He was very disturbed by it. “I need to take action,” he said. He paced back and forth thinking about how he could improve data quality. After some time, he calmed down and wrote an action for improving data quality.

A. Describe how Dr. Robsan defined the problem

_____

_____

B. Major activities:

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

7.3. Facility/office checklist

Facility/office checklist: Circle the facility/office types from the choices given in brackets.				
Person interviewed (name, title, organization):				
Facility/Office Type: (Health post, health center, Hospital, Woreda health office)				
Facility/Office Name:				
Section I. Equipment – *Please verify if the following equipment is available in the facility*				
Hardware	Yes	No	If yes, Quantity	How many are in working condition?
Calculator				
Data back-up unit (e.g. floppy, CD, zip)				
Telephone line				
Electricity				
Internet connection				

Annex Two

7.4. Pre and post test about benefit of HMIS data quality and information use practice and its determinants.

The questions were asked to assess the knowledge and attitude of health workers toward benefit of HMIS data quality and information use practice and its determinants.

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

CODE----------

1. Health management information system (HMIS):

A. Collect data from service records and administrative records

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

C. Used for decision making

D. A and B

E. None

2. Why do we need information?

A. To make policy and management decision

B. For monitoring and evaluation

C. For project management

D. A and B

E. All of the above

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

a. Computer data entry person

b. Health Extension Workers

c. Director of Medical Services Directorate

d. Program managers

e. All of the above

4. 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

5. **Evidence-based decision making** - is a process by which public health decisions are informed by using data transparently, and that includes stakeholder consultation

True False

6. 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 using LQAS methodology

d. Documentation of data review and use by decision makers

7. 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 health units are connected to a computerized health information system

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

True False

9. HMIS is an integral part of HIS

True False

10. 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

11. 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

12. 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 competence in performing HMIS tasks

d. None of the above

13. Monitoring is sometimes referred to as

a. Project Evaluation

b. Impact Evaluation

c. Process Evaluation

d. Performance Evaluation

e. None of the above

14. Evaluation measures

a. The timeliness of program activities

b. The outcomes and impact of program's activities

c. How closely a program kept to its budget

d. How well the program was implemented

15. Which of the following is NOT considered "Monitoring?"

a. Counting the number of people trained

b. Tracking the number of brochure disseminated

c. Attributing change in health outcomes to an intervention

d. Collecting monthly data on clients served in a clinic

16. One of the following is source for routine information

a. Census

b. HMIS

c. Vital registration system

d. Demographic Survey

17. Factors that affect HMIS data quality and information use

a. Organizational

b. Behavioral

c. Technical

d. All of the above

18. Decision making is a process that requires

a. Quality data

b. Involvement of a variety of relevant stakeholders

c. Availability of resources

d. a. and b. of the above

e. All of the above

19. Data Quality refers to

a. Relevance, completeness, timeliness, accuracy of the data

b. Timeliness and accuracy of the monthly reports

c. Timeliness, completeness and accuracy of the data

d. None of the above

20. Information management includes

a. _____

b. _____

c. _____

d. _____

Annex Three

7.5. Expected activities during session of pre-intervention result presentation

S/N	Discussion area	Objectives	Activities that have been done	Responsible bodies
1	Welcoming participants	Explain objective of the project and present the result of pre-intervention assessment	Pre-test examination	Project Manager
2	Concept & purpose of HIS, HMIS & CHIS	Explain HIS in context of health system components as well as HMIS and CHIS	Discussion and lectures	PM and participants
3	Method of data quality check and purpose of information use	Explain LQAS and RDQA, define HMIS data quality, describe dimension of data quality, explain information use practice	Exercise, discussion and lecture	PM and participants
4	Promotion of information use culture	Define & describe information use culture & its determinants, develop action plan to sustain it.	Exercise, discussion and lecture Post test examination	PM and participants

7.6. Action Plan

S/N	The identified gap	Reasons of gaps identified	Possible solutions	Responsible bodies	Required Time
1	Lack of training	Among staffs, some are newly employed	Giving on job training through TOT	PM and HMIS Performance Improvement team	Three days
2	Ineffective local action-oriented performance monitoring	Weak supportive supervision and feedback provision	Supportive supervision, Data Audit, performance review meeting	PM and HMIS Performance Improvement team	One month
3	No internal supervisory checklist for HMIS Performance Improvement	Weak supportive supervision and feedback mechanism	Developing supervisory checklist for HMIS Performance Improvement and integrate it in to regular process	PM and Woreda health office management	Recommendation
4	Over reporting	Weak supportive supervision and feedback mechanism on data quality	▪ supportive supervision ▪ Data Audit	HMIS Performance Improvement team	One month

Annex Four

7.7. The guidance rule and data audit tool

A. Assess the overall HMIS process by observing the following:

- Availability of data collection tools
- Who and how compiled, analyzed and displayed HMIS data
- Availability of functional computer
- Availability of HMIS information use guideline
- Availability of meeting's minutes for last three months

B. **Data Audit Tool**

Find the following information in the registries for the reporting period covering March 21 to April 20/2007 E.C and compare with the figures in the facility's monthly reports. If no registries, write NA (not applicable).

S/N	Data items	Source & Figures			Do figures in Col. 4 or Col. 5 matches with figures in Col 6?	
		Report	Tally	Register	Yes	No
(1)	(3)	(4)	(5)	(6)	(7)	(8)
1	Number of repeat contraceptive acceptors					
2	Number of pregnant women that received ANC at least four visits					
3	Number of birth attended by skilled professional					

4	Malaria (confirmed with P. falciparum) for female under five years of age					
5	OPD attendance of female 15 years & above					
6	Clients (20-24 years :female) receiving HIV test results (at VCT)					
7	Number of children under one year of age who have received measles vaccine					

C. Supportive supervision checklist for information use practice

Section I: Frequency and Type of Produced HMIS Reports			
1	Please list all reports that contain data/information generated through the HMIS. Please indicate the frequency of these reports and the number of times the reports actually were issued during the last 12 months. Please confirm the issuance of the report by visually observing it.		
	Title of the report	No. of times this report is supposed to be	No. of times this report actually has been issued
1.1	Monthly Report		
1.2	Quarterly Report		
1.3	Annual Report		
Section II: Display of Information in the Facility			
	Does the facility display the following data? Please indicate types of data displayed and whether the data have been updated for the last reporting period. If no go to Section III		

2	Indicators	Type of display (Please tick)		Updated	
2.1	Related to maternal health	Table		1.Yes	0.No
		Graph/Chart			
		Map/other			
2.2	Related to child health	Table		1.Yes	0.No
		Graph/Chart			
		Map/other			
2.3	Disease surveillance	Table		1.Yes	0.No
		Graph/Chart			
		Map/other			
Section III: Use of Information in Available Reports at Facility					
3	Is feedback, quarterly, yearly or any other report on routine HMIS data available, which provides guidelines/ recommendations for actions? (If no go to next section)			1.Yes	0.No
4	If you answered yes to question Q3, what kinds of action-oriented decisions have been made in the reports (based on routine HMIS data)? Please check boxes accordingly.				
	Types of decisions based on types of analyses				
4.1	Review strategy by examining service performance target and actual performance on month to month comparisons			1.Yes	0.No
4.2	Review facility personnel responsibilities by examining service target and actual performance on month to month comparison			1.Yes	0.No

4.3	Mobilization of resources based on comparison by services	1.Yes	0.No
4.4	Advocacy for more resources by comparing performance by targets and showing gaps	1.Yes	0.No
Section IV: Discussion and Decisions on Use of Information at the Facility Level			
5	Does the facility have routine meetings for reviewing managerial or administrative matters?	1.Yes	0.No
6	How frequently is the meeting supposed to take place? 4. Weekly; 3. After every two weeks; 2. Monthly; 1. quarterly		
7	How many times did the meeting take place during the last three months? **12.** 12 times or more; **4.** 4 times; **2.** 2 times; **0**. None		
8	Is an official record of management meetings maintained?	1.Yes	0.No
9	If yes, please check the meeting records for the **last three months** to see if the following topics were discussed:		
9.1	Discussion on routine HMIS findings such as service utilization, disease data, or service coverage & etc.	1.Yes, observed	0. No
9.2	Have they made any decisions based on the above discussions?	1.Yes, observed	0. No
9.3	Has any follow-up action taken place on the decisions made during the previous meetings?	1.Yes, observed	0. No
Section VI: Promoting Routine HMIS Information Use at the Facility Level			
10	Did the Facility records for the last three months show that HC/woreda issued	1.Yes	0.No

	directives concerning the use of information				
11	Did the person in charge of the Facility participate in meetings at the HC/District level to discuss Routine HMIS performance over the last three months?			1.Yes	0.No
Section VII: Supervision by the Health center/District					
12	How many times did the Health center/District level supervisor visit your facility during the last three months? (check the answer)	1	2	3	4
13	Did the supervisor check the data quality?			1.Yes	0.No
14	Did the supervisor send a report/feedback/note on the last two supervisory visits?			1.Yes	0.No