

# Assessment of Health Management Information System (HMIS) implementation in South West Shewa Zone, Oromia, Central Ethiopia.

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## Research Article

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# Abstract

**Background:** Health management information system (HMIS) is a system that allows for the collection, storage, compilation, transmission, analysis and usage of health data that assist decision makers and stakeholders manage and plan resources at every level of health service. The objective was to assess Health Management Information System (HMIS) implementation in south west shewa, oromia, central Ethiopia 2019.

**Methods and Materials:** The assessment was conducted in south west Shewa from August 17 to 25, 2019. Facility based cross sectional study design was employed and 22 health centers were included in the study. Collected data was entered in Epi-data and analyzed using SPSS 23 and Microsoft excel 2010.

**Results:** Among health centers assessed 58% and 92% had HMIS unit and electric power respectively. In all woredas HMIS focal person was assigned and trained on information use. At health center level HMIS recording and reporting, indicator reference, NCoD and information use manuals availability were 25%, 33%, 17% and 58% respectively. The study shows that implementation of information display, and functionality of PMT were 74% and 58% respectively. During the assessment interviewed midwives on the service delivery unit only 75% of health center define and record new and repeat acceptor of family planning according to the national revised HMIS indicators. Also 67% of health officer assigned to outpatient department define new and repeat and filled in the register properly and some of them didn't use NCoD to classify HMIS disease classification.

**Conclusions:** Health management information System (HMIS) in south west shewa zone was not fully implemented and there is a challenge related to improving data accuracy, access to computerized HMIS data and competencies to analyze, interpret and use of HMIS data at health center levels. Also, presence of reporting mechanism, displaying information and feedback mechanism were poor at health center level. Therefore, it is important to function performance monitoring team meeting and supportive supervision regularly at all levels.

## Introduction

Health Management Information System (HMIS) is a system that allows for the collection, storage, compilation, transmission, analysis and usage of health data that assist decision makers and stakeholders manage and plan resources at every level of health service (1). Health information is the processed data and knowledge that an individual or group use to support their decisions in the health sector (1,2). It is fundamental for the overall health system which informs decision-making in each of the other five blocks of the system and improving managerial decisions by providing quality information for evidence-based health practices. The World Health Organization (WHO)'s framework for health systems strengthening identifies six attributes of a health system (2). The attributes, or building blocks, include a health workforce; health services; health financing; governance and leadership; medical products, vaccines, and technologies; and health information. While each building block of the WHO framework is

important to improving health systems and ultimately health outcomes, quality and timely data from health information systems (HIS) are the foundation of the overall system and inform decision making in each of the other five building blocks in the health system (3).

Routine health information is vital for operational, tactical, and strategic decision-making. Major problems in relation to health information which was identified by the World Health Organization (WHO) are inadequate use of existing information and evidences due to fragmentation and duplication of health information(4). In line with this the participants of the Global Summit on Measurement and Accountability for Health identified a five-point call to action with a set of targets for better data use in support of health- related sustainable development goals (SDG). One of this five-point call to action is “by 2020, countries have health information flows that involve the use of data locally to improve services and programs” (5,10).

Public health decision-making is seriously reliant on a timely availability of sound data, and globally significant human and financial resources have been invested to improve health information systems (6). It is well accepted that information generated by health care systems is used for planning, management of health commodities, detecting outbreaks, and monitoring the overall performance of the health system that further maintains the quality of care (7,11).

Sub-Saharan African countries recognized and accepted Health Management Information System (HMIS) as a source of routine health information, however, health programs frequently fall short of its efficient use to inform decisions. Ethiopian implement Health Management Information System (HMIS) since 2008 to capture and provide 131 indicators (8) used to improve the provision of health services, ultimately to improve health status of the population.

The findings of the assessment will be expected to identify major problems observed in health institutions in implementing HMIS in south west shewa zone. It will provide relevant information for planning monitoring and evaluation and show areas that needs special attention and further follow up for program improvement. Furthermore, zonal health office, woreda health offices, and health center can use the finding of this assessment as an input for informed decision making in resource allocation and identifying areas needs special concern.

## **Methods And Materials**

### **Study area and period of assessment**

The study was conducted in health facility of south west shewa zone, Oromia, central Ethiopia, from August 17 to 25, 2019. Southwest Shewa zone is one of the zonal administrations located in Oromia regional state. The zonal capital, Woliso, is 114 km from the capital city of Ethiopia, Addis Ababa. According to a report from the zonal health office in 2018, the total population of the zone was 1,101,129. There are 11 woredas and one town administration, 264 rural and 22 urban kebeles in the zone. According to population projection of 2007, there were a total of 1,101,129 populations (Male 556,194,&

Female 544,935), and urban 149,878 and rural 951,251 residents in the zone (12). There are 4 functional government hospitals, 1 Private not for profit hospital, 54 functional health centers, and 72 different levels of private clinics and 264 health posts that serve the population living around. The study was carried out in four woredas such as Wonchi, Waliso Town, Goro and Waliso Rural. The health centers are currently implementing Health Management Information System.

### **Study Design**

- Cross sectional study

### **Source Study**

- Source of the study were all health centers found in south west shewa zone,

### **Study units**

- The study units of the assessment were selected health centers,

### **Inclusion criteria**

- Health centers implementing health management information system were included in the assessment.

### **Sample Size and sampling Procedure**

#### **Sample size determination**

According to the WHO guideline for sampling district health system for assessing its functionality we select 4(30%) of the zone woredas were taken (13). Therefore, 22 health centers were included in the assessment and all health facilities' documents from April to June 2019 were reviewed.

#### **Sampling technique**

For this assessment, at zonal level, woredas were randomly selected. After selection of woredas, health centers randomly selected using lottery method depending on the number of health centers found in each woreda. All health professionals and supporting staffs working on HMIS and those are available at the time of data collection was interviewed in the study and all selected health centers were physically observed.

#### **Data collection**

#### **Data collection Instrument**

The data was collected using HMIS structured questionnaires to answer the objective of the assessment. The questionnaire contains five components such as appropriateness of the card room, functionality of HMIS system (service delivery point, records, registers, completeness and timeliness of reports), Information display, Performance Monitoring Team (PMT) and supportive supervision system. Finally, data quality was observed from registers, tally sheet and reports.

### **Data Collectors**

Ten BSc health professionals who know local language and trained on HMIS were recruited for data collection. One day orientation was given for data collectors on data collection tools and procedures by the principal investigators.

### **Data collection Field Work**

Quantitative data were collected from health professionals and supporting staffs working on HMIS and service delivery unit was interviewed using structured questionnaire. Prior to start the interview, data collectors were communicated with health centers head to obtain information about the staffs and whom to interview. Data was checked for completeness and accuracy by data collectors through out the data collection period.

### **Data Analysis**

The data was checked for completeness and coded by Epidata3.1 version. Microsoft Excel 2016 was used to develop the frameworks and SPSS version 23 was used for data analysis. A variety of descriptive statistics such as mean scoring, and percentage was calculated to describe the results.

### **Data Quality management**

Questionnaire was prepared in English and translated to local language (Afan Oromo) and retranslated back into English to ensure its consistency. The questionnaires were pre-tested at Tare health center and to ensure that whether it is clear or not for other health centers and then some corrections was done accordingly. Data collectors were instructed to check the completeness of each questionnaire at the end of each interview. The completeness of the questionnaire at the end of the day was rechecked by supervisors.

### **Ethical consideration**

Appropriate research ethical clearance was obtained from the ethical review committee of South West Shewa Zonal health office (reference number: WEFG/351/2019, June 2019) and woreda health office. This study was conducted in accordance with the Declaration of Helsinki: each study participant was well informed about the aim of the study, benefits and risks; informed written consent was secured from study participants; study participants' confidentiality was maintained; no personal identifiers were used in the data collection questionnaire and codes were used in place of them; data were kept in a protected and

safe location where paper-based data were kept in a locked cabinet and computer-based data were protected using passwords; the recorded data were not accessed by a third person, except the researcher; and data sharing will be enacted based on the consent and permission of research participants and the ethical and legal rules of data sharing.

## **Results**

### **Overview of Woredas and Health Centers**

Total numbers of study health centers were 100% response rate. Health staffs such as HMIS focal person, and heads of health centers were interviewed during the assessment. Health centers had HMIS unit and electric power access were 58% and 92% respectively. All Woredas HMIS focal person was assigned and trained on DHIS2 and information use (Table1).

### **Functionality of Health Management Information System**

Functionality of HMIS system was assessed and checked at service delivery point, records, registers, completeness and timeliness of reports. Functionality of Health Information System (HMIS) implementation as per guideline were almost all implemented 50% and 65% in woredas and health centers respectively.

### **Performance Monitoring Team (PMT)**

The assessment revealed that Performance monitoring team conducting Lot quality assurance sampling (LQAS) at health facility level and Routine data quality assurance (RDQA) at woreda level were 58% and 21% respectively (Table 3)

### **Information Display**

Availability of tables, charts and/or maps on maternal health indicators, child health indicators, facility utilization, and disease surveillance indicators were assessed for understanding the level of data display in the health facilities, and woreda health offices. Eight (67%) health centers and 2(50%) of woreda health offices were displaying data; of them 5 (42%) Health Centers and 2(50%) had updated over the last 3 months period. From this figure most of the health center does not display required information on wall and DHIS2 analysis due to skill gap of training (Table 4).

### **Supportive Supervision**

Using standard checklist supportive supervision from different levels was one of the implementations of HMIS. During the assessment 9(41%) of health centers score eight and 2(1%) of health centers do not conduct any supportive supervision for the next level as per guideline (Figure 5).

### **Guidelines and manuals for implementation of HMIS**

At least four manuals which facilitate the implementation of HIS are in place within the Woreda Health Office and Health center level. During this assessment at woreda level all manuals are available. At health center level HMIS recording and reporting, indicator reference, NCoD and Data quality and information use manuals are 25%, 33%, 17% and 58% respectively (Table 2).

## **Overall HMIS Implementation**

The assessment finding shows that over all HMIS implementation Information display, and Functionality of performance monitoring team (PMT) were 74% and 58% respectively. Functionality of performance monitoring team was curial to implement HMIS as per guideline (Figure 1).

## **Data quality and information use**

In the revised HMIS (9), definition of repeat contraceptive acceptors was modified to those clients who are ever users of any contraception and each year are coming for the first time for contraception either for re-supply or restarting or starting a different method of contraception. Thus, ever-user clients who come for second and subsequent visits are not counted. Thus, there were chances that the health staff might confuse the definition of Repeat Contraceptive Acceptors. During the assessment interviewed midwives on the service delivery unit only 75% of health center define and record new and repeat acceptor according to the national standard. Also, the data elements of different registers were did not filled properly according to the national guidelines and manuals for instance Antenatal care, PNC, Delivery registration the column box of reportable data element at the end of the registration page also not filled.

On the other hand, in case of OPD attendance, the patients' data is recorded in OPD Abstract Register and in OPD Tally sheet. In the register, one row is used for one visit and the main diagnosis is recorded even if the patient comes for more than one illness. On the other hand, in the Tally sheet, every diagnosis is tallied; moreover, the tally sheet allows tallying by age and sex groups. This arrangement encourages the health staff to rely on the tally sheet for reporting and there are chances that the records in the register and tally sheet might not match. From this assessment 67% of staffs define new and repeat and filled in the register properly and 33% of them didn't use NCoD to classify HMIS disease classification.

## **Discussion**

Among health centers assessed 58% and 92% had HMIS unit and electric power respectively. In all woredas HMIS focal person was assigned and trained on DHIS2 and information use. At health center level HMIS recording and reporting, indicator reference, NCoD and information use manuals availability were 25%, 33%, 17% and 58% respectively. The study also reveals that implementation of information display, and functionality of PMT were 74% and 58% respectively. During the assessment interviewed midwives on the service delivery unit only 75% of health center define and record new and repeat acceptor of family planning according to the national revised HMIS indicators. Also 67% of health officer assigned to outpatient department define new and repeat Diseases classification and filled in the register properly and 33% of them didn't use NCoD to classify HMIS disease classification. This is almost like the study

conducted in southern nation nationalities and peoples of Ethiopia (11). This is may be due to the similarity of health facility. Poor understanding of definition of indicators such as OPD visits and low capacity to calculate data were also contributing to the low level of data accuracy. Even though reports are scanned and entered into the database automatically a similarly low level of data accuracy also was observed while comparing the paper report against district health information system.

The use of information, another dimension of HMIS performance, was found limited in the assessed woreda. The revised HMIS in 2017 is geared towards supporting and strengthening local action-oriented performance monitoring (10). Health management information system using guidelines helps to identify gaps, to develop action plan and review progress continually improving service coverage over time. In the assessed health facilities absence of such guideline may be one of the contributing factors for the observed minimum use of HMIS information in the annual plans. This finding is consistent with the limited competence in data analysis, interpretation and problem solving at the health centers. It shows data are being collected primarily for reporting and use of data for evidence-based decision making is low at peripheral level.

## **Conclusions**

The assessment identified strengths and weaknesses of the health management information system implementation in terms of the standards set on guidelines. Also, the finding of the study area showed there were inadequacy of resources needed for performing HMIS activities such as human power, budget specifically for HMIs tasks and absence of HMIS unit (office) in the organization. The intended activities were not performed according to the guideline and capacity building activities such as training as well as supportive supervisions with written feed backs were below the expected standard. Local utilization of information for decision making was found to be less and in most health institutions data generated thorough HMIS were not used for local decision making.

## **Abbreviations**

DHIS.....	District Health Information System
FMoH.....	Federal Ministry of Health
HEWs.....	Health Extension Workers
HIS.....	Health Information System
HIT.....	Health Information Technician
HMIS.....	Health Management Information System
HP.....	Health Post
HSTP.....	Health Sector Transformation Plan
LQAS.....	Lot Quality Assurance Sampling
NCoD.....	National Classification of Diseases
OPD.....	Outpatient Department
PMT.....	Performance monitoring Team
PHCU.....	Primary Health Care Unit
RDQA.....	Routine Data Quality Assurance
SPSS.....	Statistical Package for Social Science
WHO.....	World Health Organization

## Declarations

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### Conflict of interest

No author declared conflict of interest

### Author Contributions

Conceptualisation: Addisu Bogale, Dufera Rikitu. Formal analyses : Addisu Bogale, Dufera Rikitu. Funding acquisition : Addisu Bogale, Dufera Rikitu. Methodology : Addisu Bogale, Dufera Rikitu.

Project administration: Addisu Bogale, Dufera Rikitu. Ressources : Addisu Bogale, Dufera Rikitu.

Supervision: Addisu Bogale, Dufera Rikitu.

Writing – original draft: Addisu Bogale, Dufera Rikitu. Writing – review & editing: Addisu Bogale, Dufera Rikitu.

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## Tables

Table 1:Resources available for HMIS for woredas and health centers level,2019

	Health Center (YES)	Woreda Health Offices (YES)
HMIS Unit	58%	100%
Have DHIS2 Computer	75%	100%
Have Master Patient Index (MPI)	41%	NA*
Have standard Shelves	58%	NA*
Functional Virtual Private Network (VPN) line	25%	75%
Local Area Network (LAN) expansion done	42%	100%
Trained Focal person on HMIS	58%	100%
Health Informatic Technician (HIT) assigned	92%	100%
Have Electric power	92%	100%

Note: \*Not Applicable

Table 2: Guidelines and Manuals for implementation of HMIS, 2019

Manuals/Guidelines	Woreda Health office (YES)	Health Center (YES)
HMIS Recording and reporting manual	100%	25%
HMIS Indicator reference manual	100%	33%
HMIS National Diseases Classification (NCoD) manual	100%	83%
HMIS Data Quality and Information use manual	100%	42%
CHIS User's Manual Afan Oromo Version	100%	21%

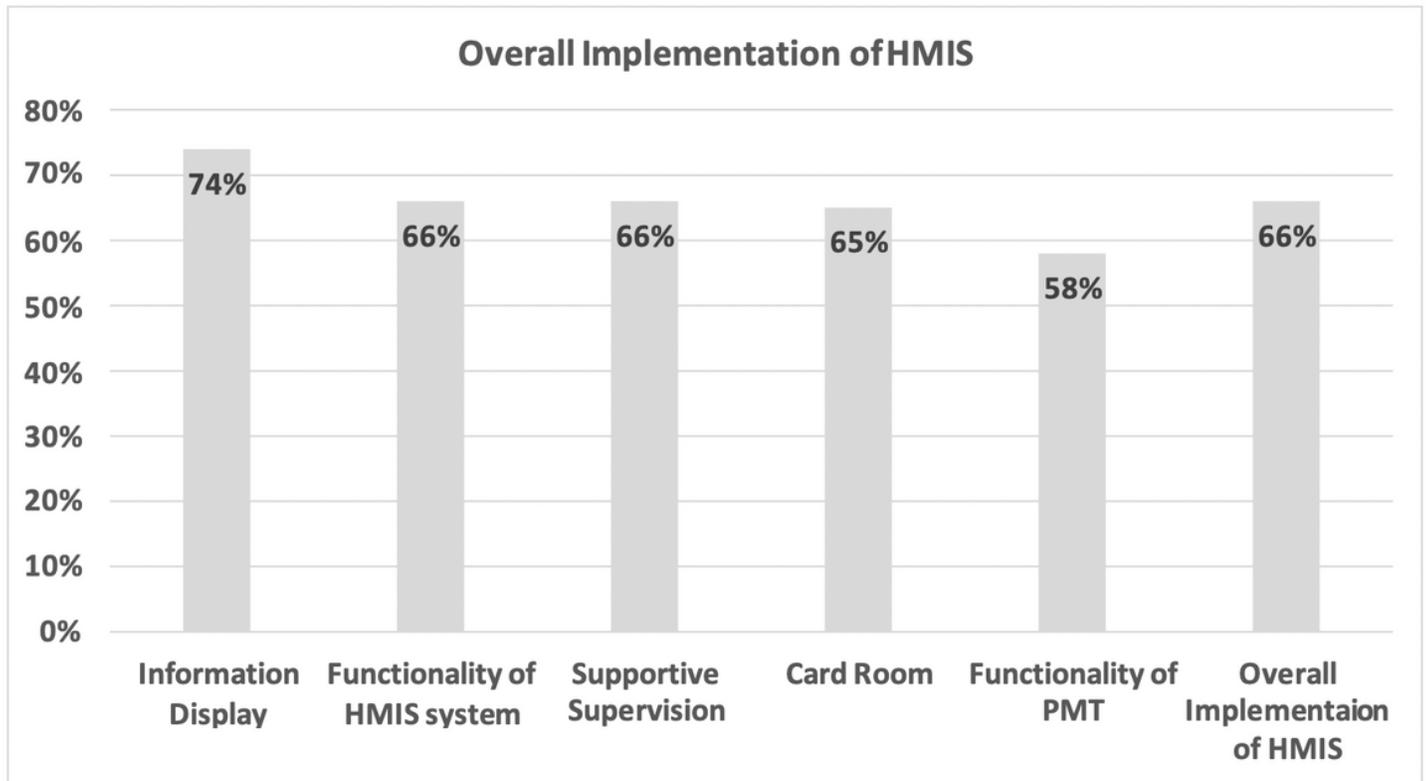
Table 3: Establishment and Functionality of Performance Monitoring Team (PMT), 2019

Performance Monitoring Team (PMT)	Health Center (YES)	Woreda Health Office (YES)
Formally established PMT as national standard	75%	100%
PMT members participated in data quality check	84%	100%
PMT meeting conducted continuously	58%	100%
PMT meeting minutes documented	67%	100%
PMT minutes book clearly shows date, time, and attendees, meeting agenda, summary of discussion & conclusions	75%	50%
Institution head or deputy head was chaired PMT meeting	83%	100%
PMT identifies performance gaps	42%	75%
PMT set priority to solve performance gaps	33%	50%
PMT identify root causes and developed action plan using problem investigation and action plan form	33%	50%
PMT conducted resource mapping using stakeholder analysis	25%	15%
PMT ensure and implement proposed interventions and started result monitoring	25%	25%
PMT conducting Lot Quality Assurance Sampling or Data Quality Assurance quarterly	58%	25%

Table 4: Displaying Information at Health facility and woreda health office level, 2019

Display Information	Health Center	Woreda Health Offices
HP/PHCU/Woreda has displayed any charts or table of performance monitoring in HMIS unit and/or Office of institution head	67%	50%
Charts/Tables have been updated for the last month	42%	50%
Charts/Tables have clear title, axes naming, plot area & legends	67%	50%
Worksheets/data sources for the charts/table were documented	42%	50%

## Figures



**Figure 1**

Overall implementation of HMIS,2019

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [QuestionnaireforassessmentofHMISImplementation.pdf](#)