

# Utilization of Routine Health Management Information and Associated Factors among Health Professionals Working at Public Health Facilities of Hadiya Zone Southern Ethiopia

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## Research article

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# Abstract

Background Health management information system is a system that used for routine data collection, analysis and utilization in health system. However, limited study done on routine health management information at individual health professionals level. Hence, the objective of this study was to assess utilization of routine health management information and associated factors among health professionals working at public health facilities of Hadiya Zone Southern Ethiopia. Methods A facility based cross-sectional survey was conducted among health professionals working at public health facilities of Hadia Zone from March 15-30, 2018. Using single population proportion formulae, 477 participants were randomly selected. Data were collected by self-administered questioner. The data were entered in to Epi data version 3.1 and exported to SPSS version 23 for statistical analysis. Both bivariate (at  $P < 0.25$ ) and multi variable logistics regressions (at  $P < 0.05$ ) were used to identify predictors of utilization. Finally, the findings were presented using graphs, tables, narratives and descriptive numerical summary. Results The finding of this study revealed that utilization of health management information system among health workers was 54.9%. Knowledge [AOR=1.576, 95%CI (1.012, 2.454)], confidence level [AOR=1.873, 95%CI(1.264,2.776)], participation on data aggregation [AOR=2.289, 95% CI (1.293,4.05)], register their daily data [AOR=2.529, 95% CI(1.023, 6.251)], and complexity of formats [AOR=1.971, 95%CI(1.29,3.011)] were found to be significantly associated with utilization of health information system at 95%confidence level. Conclusion and recommendations The overall health information utilization among health workers was low relative to other literature. Having good knowledge, high confidence level, participation on data aggregation, registering their daily data were independent predictors of information utilization. Therefore, stakeholders at each level should improve capacity of health care providers like providing training and regular mentorship related with information use.

## Background

Health Information System (HIS) is the processes and mechanisms through which health-related data is produced and made accessible to users, through networking within and outside the Health Sector (1,2). Health information has been diversely expressed as the “foundation” for superior health, as the “glue” holding the health system together, and as the “oil” keeping the health system running. Health management information system (HMIS) is part of HIS that provide routine facility based service delivery information for decision making (3).

Health information utilization is at its immature in developing countries due to resource constraint. Many of health professionals focus on treatment of patient due to lack of training; there is limited awareness on the importance of patient data recording. Consequently, decision-makers cannot identify problems and needs, track progress, evaluate the impact of interventions and make evidence-based decisions on health policy, program design and resource allocation (4).

In Ethiopia, there was limited culture of using health information for decision-making for planning and management of programs. Majority of the facilities didn't exercise discussion and make decisions using

findings from routine health information (5,6). Study in Tigray reported that 27.5% participants' didn't used health information for planning and 57.6% respondent didn't used to observe trends of health service. Also only 62.3% said that performance monitoring team puts a solution according to the problem identified (7).

According to health sector transformation plan and information road map, in Ethiopia the major problem of HMIS information use at all levels. This is due to many factors like lack of attention given to HMIS, shortage of resource and lack of strategic plan as well as lack of integration, absence of standards and guidelines, inadequate staffing and poor ownership. In addition to these, HMIS Activities have been weakly coordinated at the districts and facilities level where data was produced primarily(6,8,9)

Excellent management is a precondition for increasing the competence of health services. The challenge for health systems is to optimize the management of service delivery in a way that minimizes losses in effectiveness. Information support was one of most frequently cited major barrier to effective management. For information to influence management in an optimal way, it has to be used by decision-makers at each point of the management spiral. It is crucial at all management levels of the health services, from the periphery to the center. It is crucial for patient/client management, for health unit management, as well as for health system planning and management. This means that not only policymakers and managers need to make use of information in decision making but also care providers, including physicians, health technicians, and community health workers (10).

The regular use of reliable information from a well-designed Routine Health Information System (RHIS) is indispensable for ensuring and sustaining improvements in health system performance. Using reliable information from RHIS over time is an important aid to improving health outcomes, tackling disparities, enhancing efficiency, and fostering innovation (11). Despite this fact, there is no study conducted by on health information utilization by involving service providers. Therefore, this study assesses health information utilization by including service providers as study participants. It will be used as crucial inputs for resource allocation, planning, capacity building, identifying area, which need special concern as well as baseline information for future studies.

## **Methods**

### **Study setting and design**

The study was conducted in Health Facilities in Hadiya Zone, which is found in the Southern Nations and Nationalities Region of Ethiopia from March 15–30/2108. Its capital town is Hosanna Town, located at 194Km south of Hawassa, the capital of southern regional state; and 230 km southwest of Addis Ababa the capital city of Ethiopia. According to the data obtained from the zonal health department, 2017/2018 projected population of the zone was around 1,611,756. There are 1 general hospital, 2 primary hospital, 61 health centers, and 305 health posts. It has two-town administration and currently there are 10 woredas covers an estimated area of 3542.66sq km. Facility based cross-sectional study design was employed.

**Population:** The source population was all health workers involved in HMIS activities at public health facilities of Hadiya zone while the study population was randomly selected health workers involved in HMIS activities in selected health Facilities of Hadiya zone. Those health workers who had less than six months experience were excluded from the study.

### **Sample size determination and sampling technique**

The sample size was calculated by using single population proportion formulae using the following assumptions.  $P=0.7$ (the level of utilization of health management information system in Hadiya zone health facilities at 2014) (12), marginal of error (d) of 5%, confidence interval of 95% and  $Z_{\alpha/2}$  is the value of the standard normal distribution corresponding to a significant level of alpha ( $\alpha$ ) of 0.05, which is 1.96. This yields a sample size of 323. Since the study employed multistage sampling technique, it was necessary to apply design effect of 2. This yields a sample size of 646 (13). Because the total populations who were involved in HMIS data compilation and reports was less than 10,000 which are 1,753 (14), population correction formula used was used and the sample size was 472. By considering 5% non response rate the final sample size was 496 and distributed proportionally to each health facilities to obtain representative sample. Finally, the sample were selected by simple random sampling technique from each facility.

### **Variables**

The dependent variable was health management information system use. The independent variables were; socio-demographic factors: age, sex, education status, types of institution, position in case team technical factor: perceived complexity of formats. Behavioral factors: knowledge on HMIS, data quality checking skill, confidence level of HMIS tasks, level of motivation. Organizational factors: training, supervision, regular feedback, management support. HMIS Processes: aggregation of data, collecting data on daily basis

### **Data collection tools**

Self-questionnaires were adopted from World Health Organization(WHO) measure evaluation PRISM frame work and HMIS users guideline (15,16). The questionnaire containing background information of the respondents, knowledge on HMIS, self-efficacy test to know confidence level of staffs in HMIS tasks, motivation of staffs to collect data and utilization of HMIS data for decision-making were prepared. WHO measure evaluation tested the reliability and validity of these tools in African countries and the Cronbach's alpha was greater than 0.7 (17).

### **Operational Definitions**

**Health management information Use:** Respondents were categorized as good health information users and poor information users based on number of utilization questions they practiced. Those health

professionals who used HMIS data for four or more purpose from eight utilization questions were said to be good health information users and those who used blow four said to be poor health information users.

**Complexity of formats:** Inability of formats to be user friendly/understandable. Four questions were asked to assess complexity of HMIS formats. Those who answered "Yes "for more than two questions were categorized as health professionals who perceived formats were no complex.

**Level of Knowledge:** A health professional said to have good knowledge if he/she responds knowledge questions above mean score.

**Data quality checking Skill:** A health worker said to have data quality checking skill if he/she was able to calculate data accuracy.

### **Method of data analysis**

After checking completeness, the data were coded and entered to Epi data version 3.1 then export to SPSS version 23 for analysis. Recoding, categorizing and computing of variables were made. In order to determine the association between dependent and independent variable binary logistic regression was used. Candidate variables were selected at p-value of less than 0.25, and then entered in to multi-variable logistic regression model. P-value of less than 0.05 at multi-variable logistic regression was independent predictors of routine health information utilization. Odds Ratio with 95% confidence intervals was computed to show the strengths of associations.

### **Ethical consideration**

The ethical approval and letter of support was obtained from Jimma University, institute of health, institutional review board. An official permission was sought from Hadiya zone health department; Woreda Health Office and each facility participate in the study. Data collection for the evaluation was done with all consideration of the norm and values of the study participants. Moreover, oral consent was obtained from participants during data collection time. Confidentiality was assured for the information provided using anonymous code.

## **Results**

### **Socio-Demographic characteristics**

A total of 477 health workers were participated in the study yields 96% response rate. Majority 288(60.4%) of respondents age was less than 30 years and about 352(73.8%) participants were male. More than two third 338(70.9%) of respondents were from health centers and more than half 288 (60.4%) of respondents were diploma holders. Majority 407(85.3%) of respondents were service providers (**Table: 1)**

### **Health information utilization**

The result showed most of respondents 326(68.3%) used HMIS data to identify and manage epidemic and the least percent 233(48.8%) use HMIS data on using data for day-to-day management of their activities. About 57.5 % of them indicated that they used health information to find the root cause(s) of the problem/s in service area, 306(64.2%) of them use HMIS data to plan for future actions and 279(58.5%) of them use HMIS data for monitor change in indicators. **(Table 2)**

When we categorize respondents in two, 262(54.9%) of health professionals used HMIS data for four or more purpose from eight utilization questions which was considered as good health information users. Those who used blow four said to be poor health information users and which accounts 215(45.1%). **(Fig.1)**

## **Description of Independent variables**

### **Individual Behavior**

Majority of the study participants (73.79%) have good knowledge on HMIS. Sixty percent of them were confident enough to utilize HMIS Data for decision making. Regarding to participation on data aggregation, 393(83.39%) of them were participated on it and majority of them register data's of their daily activities from the service area. The proportion of individuals who perceive HMIS data collection formats are complex to understand use was only 12% **(Table 3)**

### **Organizational related factors**

From the total respondents 338 (70.85%) were included from health center and 267(55.97%) of them received regular feedback from immediate managers. Sixty percent of participants were not trained HMIS, 301(63.1%) of them were received supervision from immediate boss**(Table 4)**.

## **6.5 Factors associated with information utilization**

Based on multivariable logistic regression analysis; knowledge, confidence level, participation on data aggregation, complexity of HMIS formats (no), daily registration of data counterparts and were significantly associated with routine health management information use.

The odds of health information utilization among health workers with good knowledge on HMIS were greater than those who had poor knowledge [AOR=1.576, 95% CI (1.012, 2.454)]. The odds of health information utilization among Health workers those who were confident enough to perform HMIS activities were higher than their counterpart [AOR=1.873,95% CI (1.264,2.776)].Health workers those register data daily were 2.5 time more likely to utilize health information than their counterpart was [AOR=2.529, 95% CI (1.023, 6.251)].The odds of health information utilization was higher on those health workers who perceived HMIS formats were not complex than their counterparts [AOR=1.971, 95% CI(1.29, 3.011)].**(Table 5)**.

## **Discussion**

The overall routine health information utilization among health professional at public health facilities of Hadiya zone was 54.9%. This finding was less than results from study conducted public health facilities of Gonder which was 78.5%(18). The difference might be due to difference in study participants. The participants in former study were case team leaders who were users of information as compared to service providers due to their position. They have wider opportunity to participate in different training that can help them to developed behavior for data utilization. In addition to this the position by itself force them to utilize information for different purpose.

However, result detailed better achievement from studies conducted elsewhere previously by conducted in Ethiopia. which indicated 45.8% and 38.4% respectively (13,19). This better achievement may be resulted from positive effect of current information revolution on health care managers and providers and also the difference in time period.

The evaluation finding showed three fourth (75%) HIs used HMIS data during PRT meeting. The result was less than national standard, which stated all HI should conduct monthly PRT meeting by using HMIS monthly report. The result was better as compared to national assessment and study in SNNPR (5,20). The variation may be due to positive effect of information revolution and the time period in between.

According to study done in Tanzania 42% of respondents did not use the collected data for planning, budgeting and evaluation of services provision(21). In this evaluation, 64.2% & 66.2% respondents utilize data for plan future actions and evaluate whether the targets or outcomes have been achieved, respectively. So the finding shows greater achievement when compared to preceding research. The difference may be because of attention given for data utilization currently in Ethiopia this intern influence local decision makers and service providers to develop positive attitude to utilization of data. This finding was nearly comparable with result from evaluation conducted at Tigray region, which stated that out of all total respondents 72.5% of them said that the information they collected had used for planning(7).

The odds of health information utilization among health workers with good knowledge on HMIS were greater than those who had poor knowledge [AOR=1.576, 95% CI (1.012, 2.454)]. The result was supported by studies conducted elsewhere (4,19). Similarly, this result was supported by assessment done by Lippeveld T ,Belay H. at 2013, stated that Limited knowledge about usefulness of data has been the primary factor linked to lack of demand for data quality and use of information (16).

The odds of health information utilization among Health workers those who were confident enough to perform HMIS activities were higher than their counterpart [AOR=1.873,95% CI (1.264,2.776)]. The results from studies conducted in SNNPR and Uganda supports this finding (17,20). WHO measure evaluation also suggested this factor as one of determinants of health information utilization (22). Probably health professionals self-efficacy may came from knowledge and understanding about HMIS. Good knowledge and understanding of HMIS tasks in turn result good utilization of health information for decision-making.

Health workers those register data daily were 2.5 time more likely to utilize health information than their counterpart was [AOR=2.529, 95% CI (1.023, 6.251)]. These were supported by WHO measure evaluation and HMIS use guideline(22,23). Repeated exposure to data collection and aggregation may increase positive attitude toward HMIS and increase knowledge on HMIS activities. Having positive attitude and knowledge on HMIS create favorable condition for professionals to make decisions based on HMIS data.

The odds of health information utilization was higher on those health workers who perceived HMIS formats were not complex than their counterparts [AOR=1.971, 95% CI(1.29, 3.011)]. One of principles during redesign of HMIS is simplification of data Collecting, analyzing, and interpreting(24). The result was supported by WHO measure evaluation which listed complexity of formats as one of impediments for health information utilization and other assessments done elsewhere (16,22,23,25). This may be because when formats are not easily understandable, it is difficult to register relevant information in correct manner and retrieval of these data will be trouble full.

### **Limitation of the study**

Using self administered questionnaires may affect the validity of the responses. To minimize this brief orientation was given for each participant. Due to budget constraint this evaluation didn't include health posts, this may overestimate the finding.

## **Conclusions**

Utilization of health information for decision was low relative to other literatures. The major factors that affect utilization of health information were knowledge, daily registration of data, participating on report aggregation, level of confidence and complexity of formats. Therefore, recommendation has been given to Hadiya Zonal department and woreda health offices should perform continues in service training to update health workers. Health facilities: should prepare orientation session for health professionals in order to improve capacity of professional on HMIS tasks, should use routine health information to make decision and encourage health professionals to use information during performing their routine activities

## **Abbreviations**

HIS: Health Information System, HMIS: Health management information system, RHIS: Routine Health Information System

## **Declarations**

**Ethics approval and consent to participate**

The ethical approval and letter of support was obtained from Jimma University, institute of health, institutional review board. An official permission was sought from Hadiya zone health department; Woreda Health Office and each facility participate in the study. Data collection for the evaluation was done with all consideration of the norm and values of the study participants. Moreover, oral consent was obtained from participants during data collection time. Confidentiality was assured for the information provided using anonymous code.

### **Consent for publication**

Not applicable

### **Availability of data and materials**

The data supporting our findings are found at, kept in confidential and stored at the correspondent author both in hard and soft copies. If someone wants our data, we are voluntary to share it and the correspondent author should be contacted through the email address under the author's information

### **Competing interests**

We all authors declare that the study has no competing of interests.

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The authors received no specific funding for this work.

### **Authors' Contributions**

TO develop the proposal, carried out data collection, conducted the analysis, involved in reviewing the manuscript and had full access to all the data in the study and had final responsibility for the decision to submit for publication. YS and BT provided general guidance in the overall study progress and participated in reviewing the proposal, reviewing the analysis and final study document development. All authors read and approved the final manuscript.

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## Tables

**Table 1:** Socio-demographic characteristics of respondents of implementation evaluation of HMIS public health facilities Hadiya Zone, 2018 (n=477)

Variable	Category	Frequency	Percent
Age	< 30 years old	288	60.4
	> 30 years old	189	39.6
Gender	Male	352	73.8
	Female	125	26.2
Working facility	Health center	338	70.9
	Hospital	139	29.1
Educational status	Certificate	4	.8
	Diploma	288	60.4
	Degree	181	37.9
	Masters and above	4	.8
Position	Case team leader	70	14.7
	Service provider	407	85.3

**Table 2:** Health Information utilization by providers for implementation evaluation of HMIS in Hadiya Zone public health facilities 2018 (n=477)

SNo.	HMIS data utilization items	Yes	No
1	Use HMIS data to identify problems in performance	272(57)	205(43)
2	Used HMIS data communing education and mobilization	254(53.2)	223(46.8)
3	Used HMIS data for evaluate the targets	316(66.2)	161(33.8)
4	Used HMIS data to monitor change in indicators	279(58.5)	198(41.5)
5	Used HMIS Data for planning future action	306(64.2)	171(35.8)
6	Used HMIS data to find the root cause(s) of the problem	274(57.5)	203(42.5)
7	Used HMIS data for day management of their activities	233(48.8)	244(51.2)
8	Used HMIS data to identify and manage epidemics	326(68.3)	151(31.7)

Table 3: Behavioral characteristics on HMIS data use of participants in Hadiya Zone public health facilities 2018 (n=477)

Variable	Categories	Frequency	Percentage
Knowledge on HMIS	Good knowledge	352	73.79
	Poor knowledge	125	26.21
Have data quality checking Skill	Yes	295	61.84
	No	182	38.15
Confidence level	Confident enough	290	60.79
	Not confident	187	39.20
Participation on data Aggregation	Yes	393	82.39
	No	84	17.61
Registering data daily	Yes	438	91.82
	No	39	8.17
Complexity of HMIS formats	Not complex	420	88
	Complex	57	12
Motivation	Favorable	360	75.47
	Unfavorable	117	45.49

Table 4: Organizational related factors characteristics on HMIS data use of participants in Hadiya Zone public health facilities 2018 (n=477)

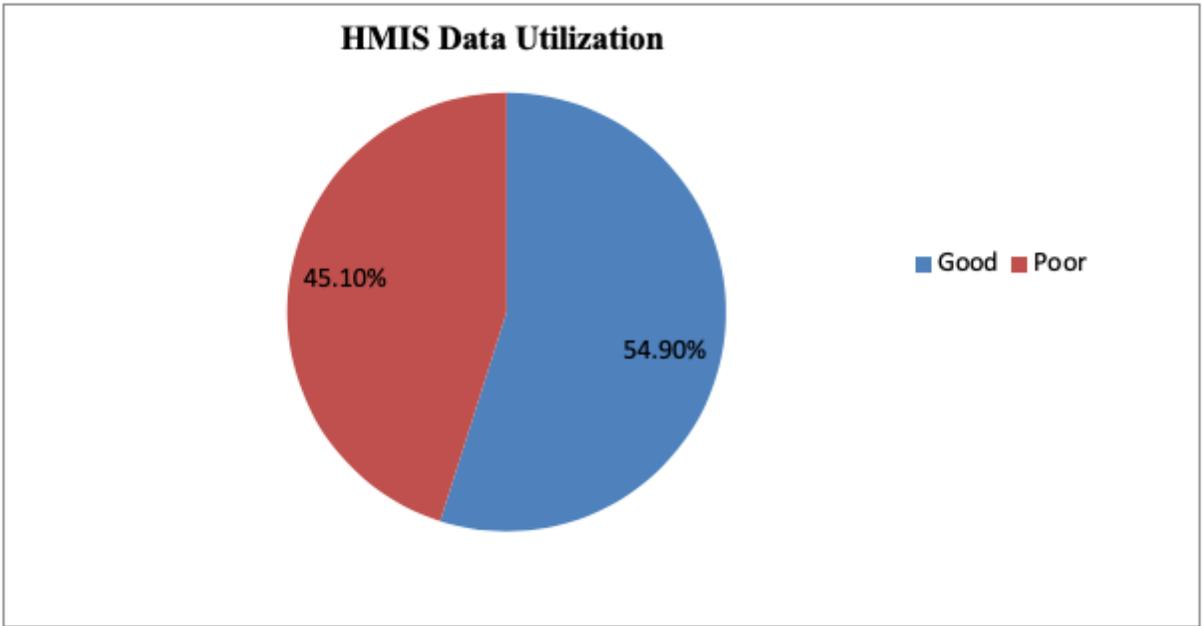
Variable	Categories	Frequency	Percentage
Supervision	Yes	301	63.10
	No	176	36.89
Training on HMIS	Yes	190	39.83
	No	287	60.16
Management support	Has support	301	63.10
	No support	176	36.89
Regular feedback	Yes	267	55.97
	No	210	44.02
Types of institution	Hospital	139	29.14
	Health center	338	70.85

**Table 5:** Factors associated with health information utilization among health workers in public health facilities, Hadiya zone 2018. (n=477)

Variables		Utilization (n=477)		COR (95% CI)	AOR (95% CI)
		Good	Poor		
Age of respondents	>30yrs	99(52.4%)	90(47.6%)	1.28(0.88, 1.85)*	0.917(0.609, 1.382)
	<30yrs	133(46.2%)	155(53.8%)		1
Educational status of respondents	Degree and above	77(41.6%)	108(58.4%)	0.63 (0.43, 0.91)*	0.91(0.59,1.39)
	Diploma and below	155(53.1%)	137(46.9%)		1
Knowledge on HMIS	Good knowledge	185(52.6%)	167(47.4%)	1.91 (1.23,2.89)*	1.57** (1.01, 2.45)
	Poor knowledge	47(37.6%)	78 (62.4%)		1
Data quality checking Skill	Yes	164(55.6%)	131(44.4%)	2.1(1.438,3.06)*	1.339(0.88, 2.05)
	No	68(37.4%)	114(62.6%)		1
Confidence level	Confident enough	161(55.5%)	129(44.5%)	2.039(1.4, 2.97)*	1.873** (1.26, 2.77)
	Not confident	71(38%)	116(62%)		1
Training on HMIS	Yes	104(54.7%)	86(45.3%)	1.5(1.04,2.17)*	0.954 (0.62 ,1.47)
	No	128(44.6%)	159(55.4%)		1
Supervision	Yes	156(51.8%)	145(48.2%)	1.416(0.97,2.06)*	1.04 (0.681, 1.59)
	No	76(43.2%)	100(56.8%)		1
Management support	Has support	160(53.2%)	141(46.8%)	1.64(1.12, 2.38)*	0.98(0.61, 1.562)
	No support	72(41%)	104(59%)		1
Participation on data Aggregation	Yes	211(53.7%)	182(46.3%)	3.478(2.04,5.92)*	2.29(1.29,4.1)**
	No	21(25%)	63(75%)		1
Registering data daily	Yes	225(51.4%)	213(48.6%)	4.82(2.2,11.18)*	2.53(1.02,6.25)**
	No	7(18%)	32(82%)		1
Complexity of HMIS formats	Not complex	180(56%)	142(44%)	2.51(1.68,3.744)*	1.97(1.29,3)**
	Complex	52(33.5%)	103(66.5%)		1

\*shows candidate variables for multivariable analysis at  $p < 0.25$ , \*\* shows predictor variables for information utilization at  $p < 0.05$ .

## Figures



**Figure 1**

HMIS Data Utilization by providers for implementation evaluation of HMIS in Hadiya Zone public health facilities 2018 (n=477)