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**Health information use and the associated factors among public health facilities of the Sidama Zone, southern Ethiopia: a facility-based cross-sectional study**

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**Ethics approval and consent to participate:** Ethical approval was granted by the Institutional Review Board of Hawassa University (ref. No.IRB/066/10) on 11/01/ 2018. Then a permission letter was obtained from Hawassa University School of Public Health, Sidama Zonal Health Department, and Woreda Health Offices sequentially. Finally, the health facilities were communicated using letters received from higher officials. During data collection, professional and social ethics were maintained, and the names of the facilities and personnel involved in the study were not stated on the data collection tools. The participants were asked to sign a consent form to confirm their willingness to take part in the study.

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## **Abstract**

A strong Health Information System (HIS) is a foundation for evidence-based decision making in health care management. However, there is a dearth of literature with respect to health information use practice, particularly in public health facilities of Sidama Zone, Southern Ethiopia. A cross-sectional, facility-based quantitative study was conducted from February 1 to February 29, 2018. Quantitative data was collected using a structured questionnaire and checklists from a sample of 48 health facilities and 213 health workers, and analyzed using binary logistic regression. To complement the quantitative findings, qualitative data was collected using key informant interviews. The level of information use based on standard observation checklists was 58%. Health information system's specific supportive supervision (Adjusted Odd Ratio, AOR, 3.070; 95% Confidence Interval, CI, 1.206, 7.816), staff's perception of data use practice (AOR=3.732, 95%CI 1.383, 10.068), and staff's experience of root cause analysis (AOR=3.782, 95%CI 1.456, 9.819) were significant factors associated with the information use. Health information use among public health facilities was low. Strengthening supportive supervision, awareness creation on the use of available data, and improving the skill of root cause analysis of the problem is recommended.

## **Introduction**

Health Information Systems (HIS) are among the six building blocks of health system strengthening.<sup>1</sup> Sound and reliable HIS enables the best use of health information by ensuring health information data quality, hence assisting decision makers and stakeholders manage and plan resources at every level of health care delivery systems.<sup>2</sup>

HIS can positively impact health outcomes if strengthened and negatively impact them if not. For instance, a robust HIS can reduce health data errors, provide quick access to patient histories, improve the accuracy of diagnoses, and result in cost-effective service provision. Moreover, HIS facilitates evidence-based decisions, helping health policymakers and planners create the right policies and plans to improve the health outcomes of the population.<sup>3</sup>

According to the Health Metrics Networks (HMN) framework, there is a wide variety of HIS data that could be categorized at healthcare facilities as individual-level health status data, health services, and administrative records.<sup>4</sup>

Information use is a paramount improvement effort of any healthcare delivery system at all levels. Consequently, the data management system should be improved to generate the appropriate information for decision-making activities, without which progressive change doesn't exist.<sup>5</sup>

It is well recognized that the ultimate goal of HIS is ensuring data quality and information use for more assertive informed decisions that determine the efficiency and effectiveness of identifying performance gaps, defining priorities, proposing solutions, and allocating resources for improved health outcomes.<sup>6</sup>

Information use culture is determined by the accessibility of well-designed and documented information sources, monitoring and evaluation structures, availability of guidelines, finance, and skilled staff. These factors can be categorized into three general categories: the attitudes and actions of a multitude who produce or use information, the technical facet of data process and tools, and the organizational context that living or inhibits data processes.<sup>7,8</sup>

The need for quality data and information used for evidence-based decisions in the health care delivery systems is becoming a priority area of concern. In response, the Federal Ministry of Health (FMOH) in Ethiopia has commenced a widespread reform and redesign of the national HIS. In view of that, HIS was considered as one of the four health transformation agendas labeled as information revolution with the objective of maximizing the availability, accessibility, quality, and use of health information for evidence-based decision-making processes at all levels of health care delivery systems.<sup>8,9</sup>

However, ensuring the information used for policy and advocacy, planning and priority setting, resource allocation, implementation, and action remains critical and challenging, especially at lower levels in spite of some improvements that have been observed as a result of remarkable efforts made to develop the culture of information use.<sup>8,10</sup>

Many pieces of evidence from developing countries show that there is enormous data generated through the routine health management information system. However, utilization of the generated information for planning and programming is low.<sup>11</sup> For instance, according to one study in Pakistan, situation analysis and planning are hardly ever undertaken through Health Management Information System (HMIS) generated data.<sup>12</sup>

Another study conducted by Nyamtema, on bridging the gaps in the HMIS in the context of a changing health sector in 2008 revealed that 42% of the respondents had not ever used the HMIS-

generated data at the health facility level for planning, budget allocation, and evaluation of service delivery.<sup>13</sup> A similar study in Ethiopia indicated that 95% of health facilities could maintain source documents for the indicators; 77% and 68 of health facilities maintain the report completeness and timeliness rate within the agreed national standard respectively. Similarly, the discussion and decisions based on HMIS data occurred in 37% of the facilities.<sup>14</sup>

One similar study conducted in Ethiopia by Tsedeke on HMIS performance and factors associated with its implementation in the health facilities of Wolaita zone showed that the data recording was 100%, report completeness 94%, data accuracy 11%, data processing 86%, data display 86%, the discussion made 74%, the decisions made 32% and the follow up actions taken 26%.<sup>15</sup>

The study conducted by Mebrhatu Mahtsentu on HMIS implementation in Eastern part of Ethiopia revealed that only 22.2% of respondents use information. The same study reported that 33.3% utilize the information for planning and decision-making, 36.7% to observe the trends in service delivery, and 28.3% to seek financial assistance. A similar study stated that the documentation of HMIS data was 94%. Regarding timeliness, completeness, and consistency, they were of 51.1%, 38.1%, and 50.7% respectively.<sup>16</sup>

Another study conducted by Dubale, in Ethiopia on the electronic record system to ascertain user satisfaction with using the system and its associated factors revealed a moderate (53.10%) degree of satisfaction among healthcare professionals working at private hospitals in Addis Ababa, Ethiopia.<sup>17</sup>

One study conducted by Sultan on the use of HIS at the district level in Jimma Zone, Oromia Regional State, Ethiopia, in 2009 showed the average information use in the study area was only 32.9%.<sup>18</sup>

An assessment conducted by Ermias A. on the use of HMIS and associated factors in Hadiya Zone, SNNPR, Ethiopia, in 2014 indicated that the utilization of health management information system was 69.3% in all the study units. It is also noted that the presence of a listed set of indicators with charts and tables, complete information in the formats, and consistency between registers, tallies, and reports have improved the utilization of health information.<sup>19</sup>

A study conducted by Helen T. on the implementation of HMIS in Bahir Dar in 2011 also revealed that information used for decision-making was less than 45.6%. Regarding the purpose of data use among the study participants, 35.3% use data for future reference, 42.4% to observe the trends, and, 42.9% are to pass report data to health office.<sup>20</sup>

Another study conducted by Kidist T *et al.* on the Factors Associated with low levels of health information utilization in resource-limited settings, in Eastern Ethiopia, in 2014 also showed that the use of health information for decision-making was found to be 65.3%.<sup>21</sup>

Similarly, according to a study conducted by Mulusew A. in west Amahara of Ethiopia, only 38.4% of study participants used facility health information for two or more purposes regularly, few more than half (52%) use the information for developing plans, merely 24% and 18% for feedback and patient management respectively. The study also disclosed that only 6% of the study participants used the information for conducting research.<sup>22</sup>

The practical use of health information that is how often and how effectively data is used or not used is determined by the availability of well-designed and documented data sources, monitoring and evaluation structures, availability of guidelines, finance, and skilled staff. These factors can be categorized into three general categories: the attitudes and actions of people who produce or use information, the technical aspects of data processes and tools, and the organizational context that supports or inhibits data processes.<sup>23</sup>



In this context of factors associated with low utilization of health information, one study from Malawi reported; that absence of accountability and guidance, resource constraints, lack of holistic/vision approach, lack of management skills and personality, punitive environment, lack of incentives, inadequate dissemination of information, organizational and behavior and absence of change strategies, donor-driven interventions that focused on specific subsystems.<sup>24</sup>

In the Sidama Zone of southern Ethiopia, studies in health information use and or practice of health systems are very limited if not none. Therefore, this study aims to measure the level of health management information system's information use and explore the associated factors in the public health facilities of the Sidama Zone, in southern Ethiopia.

## **Materials and Methods**

### ***Study area***

The study was conducted in the Sidama Zone, Southern Ethiopia, from February 15 to March 5, 2018. The Sidama Zone is one of the fifteen Zones and four Special Woredas in SNNPR State which is situated about 275 kilometers away from Addis Ababa. The Zone has a total area of 6981.8 Square kilometers. It has 19 Districts and 4 town administrations with a total of 576 Kebeles (lowest administrative units) of which 524 of them are rural and 52 are urban. Based on the Ethiopian Population Census Report 2007 projections, the total population of the Zone in 2017 reached 3,804,551. Out of the total population, 5.7% are urban and 94.3% rural residents.<sup>25</sup>

The Sidama Zonal administration has a total of 4063 health professionals of different disciplines and 524 Health Posts, 127 Health Centers (HCs), 1 general and 12 District hospitals owned by the government; additionally there are 21 private, 3 Non-Government Owned (NGO) clinics, and 65

private rural drug vendors. The overall potential health service coverage of the Zone by public health facilities is 90.3%.

### ***Study design and period***

The study employed a facility based quantitative cross-sectional descriptive study design was employed because this study design is relatively quick, inexpensive to conduct and also advantageous in identifying the associated factors. The quantitative part was complemented with a qualitative study to assess the level of HMIS data quality in public health facilities and the associated factors from February 15 to March 5, 2018.

### ***Study population and sampling procedure (sampling and sample size determination)***

There are 13 Hospitals, 125 Health centers, and 524 rural health posts in the Zone. Health centers were selected using the Lot Quality Assurance Sampling (LQAS) method to determine the sample size. The preference of LQAS over conventional sampling methods is it allows low sample size needs (n=19 in most cases) that yield reliable decisions on the performance of locally relevant results for small or large supervisory areas.<sup>26</sup>

### ***Sample size determination***

All 10 Hospitals that implemented HIS a year before the data collection period were included in the assessment. Sixteen HIS performance indicators were measured at the facility level with an upper threshold of 90% and a lower threshold of 60%. A decision value (d) of 6 health centers and an acceptable alpha value of 0.06 were set. On the basis of this information, sample size (n) was estimated using LQAS sampling approach. A plan with a sample size of nineteen (n=19) was used;

this single-stage sampling plan accepts an alpha error of <10%. Accordingly, 19 HCs and one Health Post (HP) attached to each sampled health center were chosen randomly for the health post-level assessment. Overall 19 HPs, 19 HCs, and 10 hospitals were included (Table 1). For the purpose of assessing factors affecting data use, all the 213 healthcare provider staff with the responsibility of health care data management were included as a sample for the study since the size is manageable. These comprised of facility in charge, HIS focal persons/M&E team members, 3 case team coordinators, and PHCU linkage focal persons, a total of 6 health facility staff members were included. For Hospitals, CEOs, CCOs, HIS Coordinator, OPD coordinator, 3 IPD coordinators (Internal Medicine, surgery, and gynecological), and emergency coordinator, a total of 8 health workers were included to fill the questionnaire (Table 1).

For the health post level, one health extension worker with the role of reporting and coordinating activities was selected to fill out the questionnaire (Table 1).

### **Data collection tools and techniques**

Quantitative data was collected through key informant interviews and observation checklists, and a self-administered questionnaire that was adapted from PRISM framework version 3.1,<sup>25</sup> then the qualitative method was used to further explore the result found from the quantitative study through a semi-structured key informant interview guide.

Key informant interviews were conducted and documented using an audio tape recorder and backup notes were taken. Participant behavioral and contextual aspects were observed and documented as part of the interview. The questionnaire was pre-tested outside of the study site in one hospital, two HCs, and two HPs representing 10 % of the total study sample size. Six health workers with detailed knowledge of reformed HIS were selected to collect data and trained for two

days. A supervisor with previous experience in data collection and supervision was recruited to check the research data quality and to oversee the overall procedure of data collection on a daily basis. The principal investigator also followed the overall procedure of data collection closely.

### ***Data processing and analysis***

The collected data was checked for completeness, then coded, entered, and cleaned using Epi Info. version 7 and exported to Statistical Package for Social Sciences (SPSS) version 21 for analysis. Both descriptive and inferential statistics were used for the analysis of the quantitative part of the study. In the descriptive statistics, frequency percentages were computed and for inferential statistics, a binary logistic regression model was used. The degree of association between independent and dependent variables was assessed using odds ratio, 95% confidence interval, and p-value <0.05 was considered as significant. Variables that are significant at 0.25 on the bivariate level were fitted to multivariate to control the confounding effect and the model fitness was checked using the Hosmer-Lemeshow model. For the qualitative part, the transcriptions were completed within 24 hours of the interview completion. Analysis was initiated when the data collection reached halfway through the interview. The categories were coded manually and collected to respective themes. Themes were identified and organized through attentive reading and re-reading of data. Finally, the data was summarized based on the objectives of the study.

### ***Data quality assurance***

The data collectors and supervisors were provided with a two-day training that focused on the objectives of the study and how to complete the questionnaire. The supervisors were given special training on how to supervise the data collection processes. During data collection, the supervisors

and the principal investigators closely supervised the data collection process on a daily basis for its correctness and completeness. Furthermore, we conducted a pretest on facilities that possesses similarities with sampled facilities to check the data collection tools for their consistencies and any ambiguous items, and necessary amendments were made.

### ***Operational definitions***

Information is processed data useful for decision-making.

The information system is a system that provides information support for the decision-making at each level of an organization.

HMIS is a system that allows a routine 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.

LQAS is a methodological approach that helps to explore information from program planning and management. It substantially uses small sample sizes to classify health or administrative geographical areas, to inform if these areas have achieved or not a pre-determined target for a given indicator. Thus, using rigorous sampling theory it helps to identify where the successes and challenges are located.

Information use is a process of collecting, aggregating, analyzing, using information for problem identification, prioritizing solutions and deciding actions based on evidence from routine data.

In this study, information use practice is determined by at least 3 (50%) of the following 6 practices exercised by the health facilities: calculating the service coverage of their catchment area, display the updated information based on the key indicators, documented evidence for discussions based on the performance, evidence of decisions made based on discussions, evidence of actions taken, and feedback provided by the supervisor during the last visit.

## **Results**

### ***Background of study participants***

In this study, all the 48 sampled health facilities in Table 1 were participated. Of these, 19(39.6%), 19(39.6%) and 10(19%) were HCs, HPs and hospitals respectively.

Out of the total sample of 213, two hundred eight (97.6%) health workers participated. Of the total participants, 152 (73.1%) were males, 29(14%) were health facility in charge (heads of health centers and chief executive officers from hospitals), 84(40.4%) were case team leaders, 27(13%) were HMIS focal persons and 50(24%) are health care workers who are facility Performance Monitoring Team (PMT) members (Table 2). Regarding the level of education, 98 (47.1%) were all-type diploma nurses, 22(10.6 %) BSC nurses, 23 (11.1%) health officers, 17 (8.2 %) medical doctors, and 45 (23.3 %) were other health professionals (Table 2).

### ***Information use practice***

Data regarding information use practice was gathered using two approaches. First, we collected from study participants' perceptions of information use using the preset criterion. Accordingly, 137 (66%) perceived that the information use was at least good and the rest did not feel it as good (Figure 1). Second, we complemented the participants' perception of information use level by observation checklist using the same preset criterion and summarized below.

### ***Practice of data analysis for information use***

Health information needs to be summarized and ready for evidence-based decision-making at the level of data collection and in all hierarchies of the health system. In this study, out of all 48 health

facilities, 89.6% calculate indicators, 68.8% compare the performance with the target, and 35.4% compare with service type and 58.3% compare the trend of performance over time. The summary of the above indicators results with the overall level of data analysis/processing among the health facilities was 63% (Figure 2).

### ***Discussions, decisions, and actions***

A regular PMT meeting usually termed a Performance Review Team (PRT) is an opportunity to take action based on the data collected from the HMIS. The presence of PMT meetings was verified by observation of PMT minute books. The majority of health facilities, 42 (87.5%) had maintained PMT minutes in the last 3 months. It was also observed that about 21 (43.8%) health facilities had discussions on HMIS data quality. However, the remaining 56.2% did not have evidence of discussions made on data quality. Only 21 (43.8%) health facilities had decided different actions based on HMIS findings. Regarding the actions taken based on the decision made, only 5 (10.5%) health facilities took action and the remaining majority (89.6%) did not take any actions based on the decisions (Figure 3).

Generally, the overall level of information use practice among health facilities was computed based on the set criteria.

Moreover, based on the set criteria, the overall proportion of health facilities using HMIS information for decision-making and actions was found to be 28 (58%). However, in considering information used for decision-making between the health facilities; out of the 19 total HCs it was 15 (79%), that of the 10 hospitals was 5 (50%) and for the 19 HPs, this was 8 (42%) (Figure 4).

### ***Factors associated with information use practice***

According to the analysis results, in the health facilities where health workers received HMIS-specific supportive supervision, health information use was about 3.07 times more likely than in health facilities where health workers did not get any HMIS-specific supervisory (AOR=3.070, 95% CI 1.206, 7.816; Table 3).

In the facilities where Health workers document HMIS data regularly, health information use was about 3.73 times more likely than those who do not document data regularly (AOR=3.732, 95% CI 1.383, 10.068). In the health facilities where the staff feel that the root cause analysis of the problems is helpful, health information use was about 3.78 times more likely than in the facilities where the staff do not feel the root cause analysis was not helpful (AOR=3.782,95% CI 1.456, 9.819; Table 4).

### ***Qualitative findings***

The key informant interview was conducted among 12 respondents; 3 hospital HMIS focal persons, 3 health center heads, 3woreda health offices monitoring and evaluation coordinators, and 3 health extension workers from health posts.

### ***Practice of information use for evidence-based decision making***

Each of the interview participants was asked how they explain the practice of information use in their respective health care facilities and whether there are factors that they think hinder the use of health information. Accordingly, the majority of the participants stated that there is a database



system where data is collected monthly, reviewed and utilized, and this facilitates the health information use in their health facilities. However, the participants also stated that there are factors that can negatively affect the practice of information use.

A male M&E coordinator from Woreda said "At the sector level the reports received from health facilities were entered into the database and reviewed by PRT. According to the review, the gaps were identified and the feedback was sent to health facilities, and corrective measures were undertaken accordingly. Moreover, charts are used for data presentation in the selected core processes like maternal and child health, disease prevention and health promotion, and curative".

Another female health extension worker said "... we review the activities every week, and summarize it at the end of every month. Once the compiled data is reviewed, it will be sent to the next level and they eventually display data on charts and tables".

One male respondent working as a head of a health center said "We have good practice in using HMIS information for decision-making. Primarily we review data for data quality findings with PRT and health extension workers. All play their active roles. Secondly, the HMIS focal person compiles the report and all members of PRT discuss based on the findings of HMIS data and take different actions. Once the report is sent to the Woreda, there is a trend of feedback. But we always try to provide feedback for health posts before the woreda feedback is at hand".

### ***Factors that can affect the health information use***

Most of the respondents asked for organizational factors that could affect information use practice. They stated these as; not having training in the area, lack of regular supportive supervision, culture of information use, and language barrier within each of their facilities.

One health center head said “... some case team members do not use charts for data presentation because of low awareness of HMIS information use”.

Pertaining to supportive supervision, the participant said “Integrated supportive supervisions were done once in the last quarter and program-specific supervision has been done on a monthly basis. However, HMIS-specific supervision was not done regularly, but, during integrated supportive supervision, HMIS program implementation is monitored.

He also added “Good knowledge and skill on HMIS tool, a good commitment by the staff and managers are factors that facilitate use and implementation of HMIS”.

Among the participants, some raised language of the reporting and recording formats as a barrier to information use practice.

One health extension female respondent from HP said “... Community Health Information data recording tools including monthly formats are prepared in English, this gives you another challenge to understand and fill it properly”.

## **Discussion**

Health information transformation is one priority area of Ethiopia’s Ministry of Health. Information use and data quality were among the focus areas of the transformation.<sup>10</sup> The aim of this study was to assess the level of HMIS information use practice at health facilities of the Sidama Zone in southern Ethiopia based on the Performance of Routine Information Systems Management (PRISM) framework.<sup>25</sup> The study also tried to explore possible factors that affect the use of health information. Based on the observed checklist, the overall information use practice in the studied healthcare facilities was found to be 58%. However, the level of health information use practice was different when seen by facility types. While about two-thirds of health centers were found to

practice health information use; only half of hospitals and only 42 of health posts were found to practice information use. This difference could be attributed to the frequency of supervision provided by their supervisors. The overall information use finding was higher when compared to other studies conducted in different parts of Ethiopia; Harar, Jimma, and Bahirdar, where the level of HIS utilization was 22.9 %, 32.9%, and 45.6% respectively.<sup>18,20,27</sup> The difference might be due to differences in infrastructures and supplies, since the zone has multiple partners who support the HIS. The availability of HMIS personnel who can handle the data for utilization at their level and other higher levels for evidence-based decision-making might have also contributed to the difference.<sup>20</sup>

However, it was lower when compared to studies conducted in the Hadiya zone, and Eastern Ethiopia reported 69.3% and 65.3% respectively.<sup>19,21</sup> The variation in this study may be due to healthcare workers' attitudes toward routine health information utilization in the aforementioned study areas.<sup>20</sup>

In this study, factors associated with information use were analyzed based on the participants' perceptions of information use and the related factors. Accordingly, the odds of health information use among those who had HIS-specific supervision were about three times more than those of their counterparts. This is not surprising, as one would expect, supervision plays an important role in improving the performance of the health workers by feeling the identified gaps during the supervision.

In the current study, participants who reported that staff feel the documentation of HMIS data for facility management were about four times more likely to use information than those who did not report this feeling. This may imply, that if the staff keeps data documentation appropriately with

the awareness that it will serve a purpose beyond routine use, the likelihood of utilizing that information for facility management and beyond increases.

Similarly, health information use was about four times higher among the participants who felt that root cause analysis of the problem was more helpful than their counterparts. This can be explained by the fact that in facilities where participants feel that root cause analysis of the problem is carried out the performance, including information use, is higher because the staff looks at the problem from its source and seeks solution specific to the identified problem.<sup>30</sup> In this study, although the explored qualitative findings generally complement the quantitative findings, language used in the reporting formats and recording registries emerged as the unique reported factors hindering the information. Among the health post participants, there were health extension workers who found it difficult to understand the English language used in the recording and reporting formats which challenge them to keep the data and use it accordingly. While the language barrier has a negative implication on health care quality that includes health information utilization from individual patient safety side<sup>31</sup> the lower grass root level health workers, particularly health extensions' language challenge should not be overlooked.

At last, while the mixed method employed in the current study could be seen as strength, individual-level participants' attributes weren't included exhaustively which might have its own limitation in the identification of the information use associated factors.

## **Conclusions**

The information use practice in this study was found to be 58.3%. However, there is variation among health facility types; HCs, hospitals, and HPs. HMIS-specific supportive supervision,

having an understanding of HMIS data documentation for facility management, and practice of root cause analysis have an association with information use practice.

### ***Recommendations***

Based on these findings, health information system-specific supportive supervision should be maximized particularly in health posts and hospitals. Optimizing awareness of health workers in documenting the health information data for information use should be considered. Language barriers that the health extension workers who work at the grass root level should be addressed.

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**Table 1.** Sample size of health institutions included in the study.

<b>S.N.</b>	<b>Health facility</b>	<b>Sample health facility</b>	<b>Sample per facility</b>	<b>Total staff</b>
1	Health center	19	6	114
2	Health post	19	1	19
3	Hospital	10	8	80
4	Total	48*		213**

\* Number of health facilities assessed using facility checklist

\*\* Number of health workers involved in the study



**Table 2.** Description of study Participants in health facilities of Sidama, April 2018.

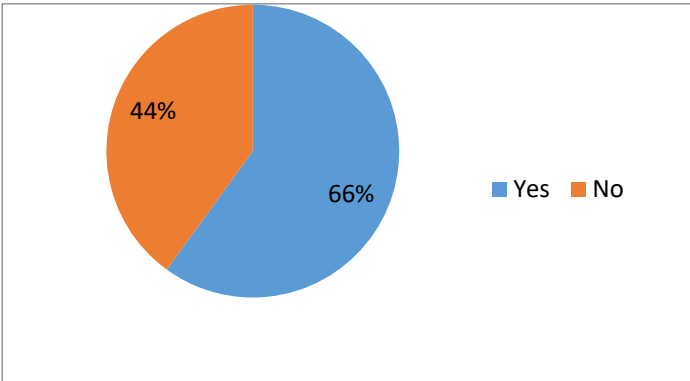
<b>Study participants (health workers)</b>	<b>Number</b>	<b>Percent</b>
<b>Sex of study participants</b>		
Male	152	73.1
Female	56	26.9
<b>Total</b>	208	100
<b>Responsibility of study participants</b>		
Facility in charge	29	13.9
Health care provider	50	24.0
Case team leaders	84	40.4
HMIS focal	27	13.0
HEWS	18	8.7
<b>Total</b>	208	100.0
<b>Qualification of the study participants</b>		
Diploma nurse (all type)	98	47.1
BSC nurse	22	10.6
Health officers	23	11.1
Medical doctor	17	8.2
Other health professionals	47	23.0
<b>Total</b>	208	100.0

**Table 4.** Factors associated with information use practice as perceived by the study participants, Sidama Zone, SNNPR, April 2018.

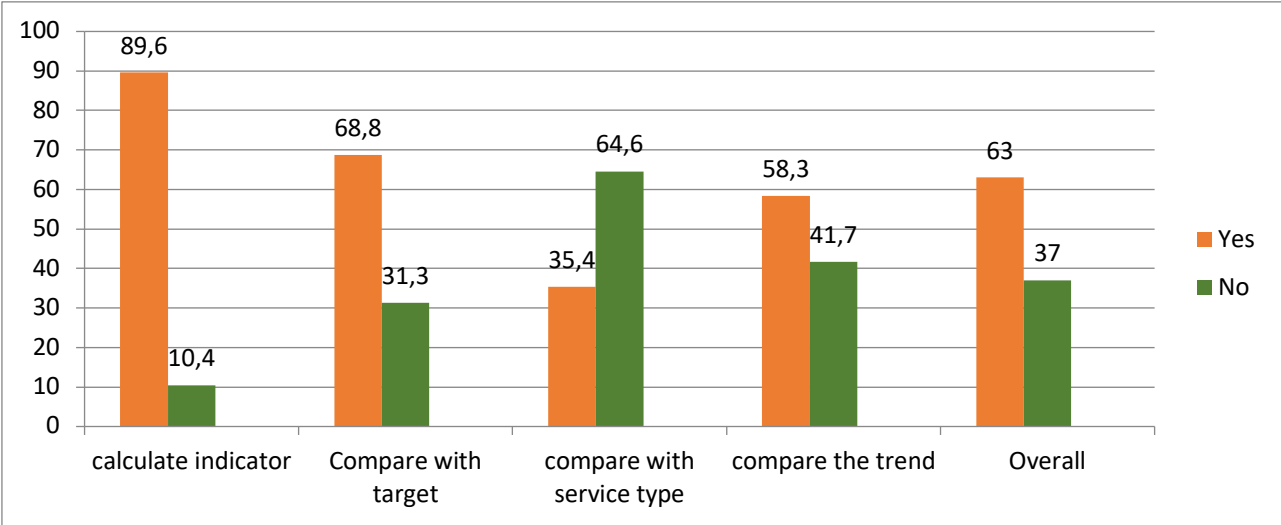
Variables		In information use		COR with 95% CI	AOR with 95% CI
		Yes	No		
Exposure to formal HMIS trainings	Yes	70	48	2.205(.981, 4.957)	2.129(.958, 4.727)
	No	67	23	1.00	1.00
Received HMIS specific supervision	Yes	68	32	3.464 (1.325, 9.055)	3.070 (1.206, 7.816)*
	No	69	39	1.00	1.00
Availability of Adequate HMIS tools	Favorable	96	38	2.816(1.064, 7.450)	2.287 (.907, 5.764)
	No	41	33	1.00	1.00
Staff feel that the document of HMIS data is for facility management	Yes	112	46	4.066(1.493,11.068)	3.732(1.38, 10.068)*
	No	25	25	1.000	1.000
Root cause analysis of the problem is helpful	Yes	109	39	3.494(1.335, 9.142)	3.782(1.456, 9819)*
	Complex	28	32	1.000	1.000
Simplicity of HMIS reporting formats	Simple	111	48	2.681(.940, 7.646)	2.549(.910, 7.141)
	Unfavorable	26	23	1.000	1.000

\*p<0.05

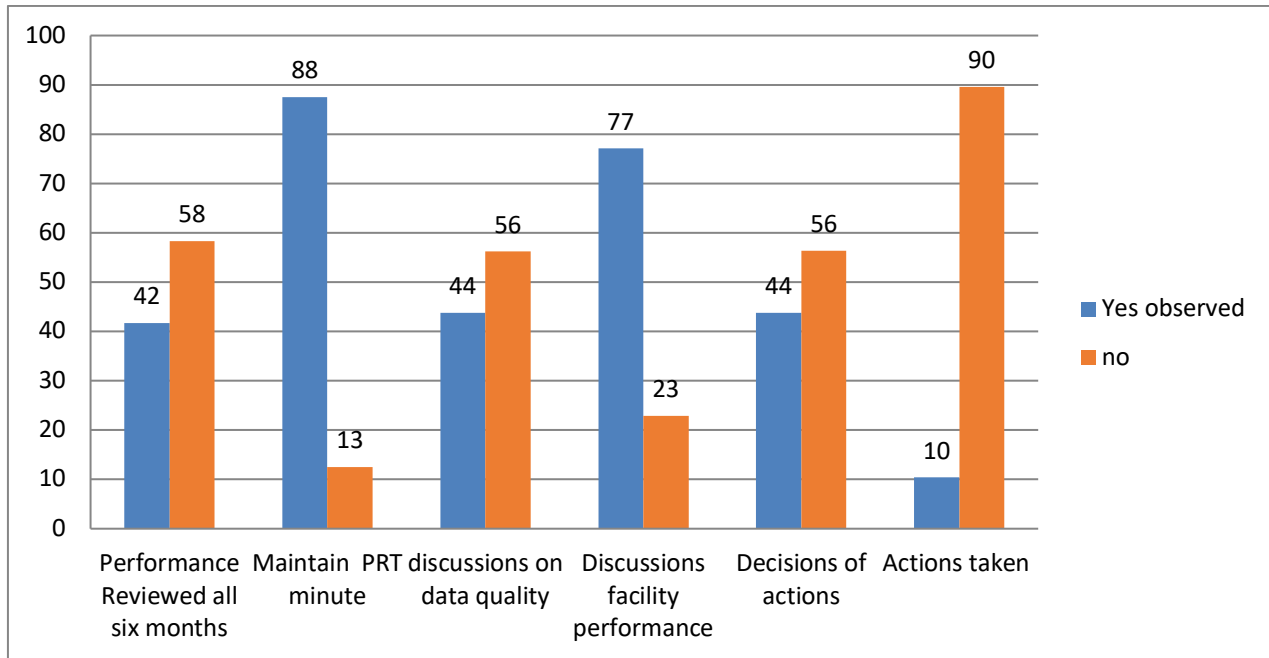
CI, Confidence Interval; COR, Crude Odds Ratio; AOR, Adjusted Odds Ratio; HMIS, Health Management Information System



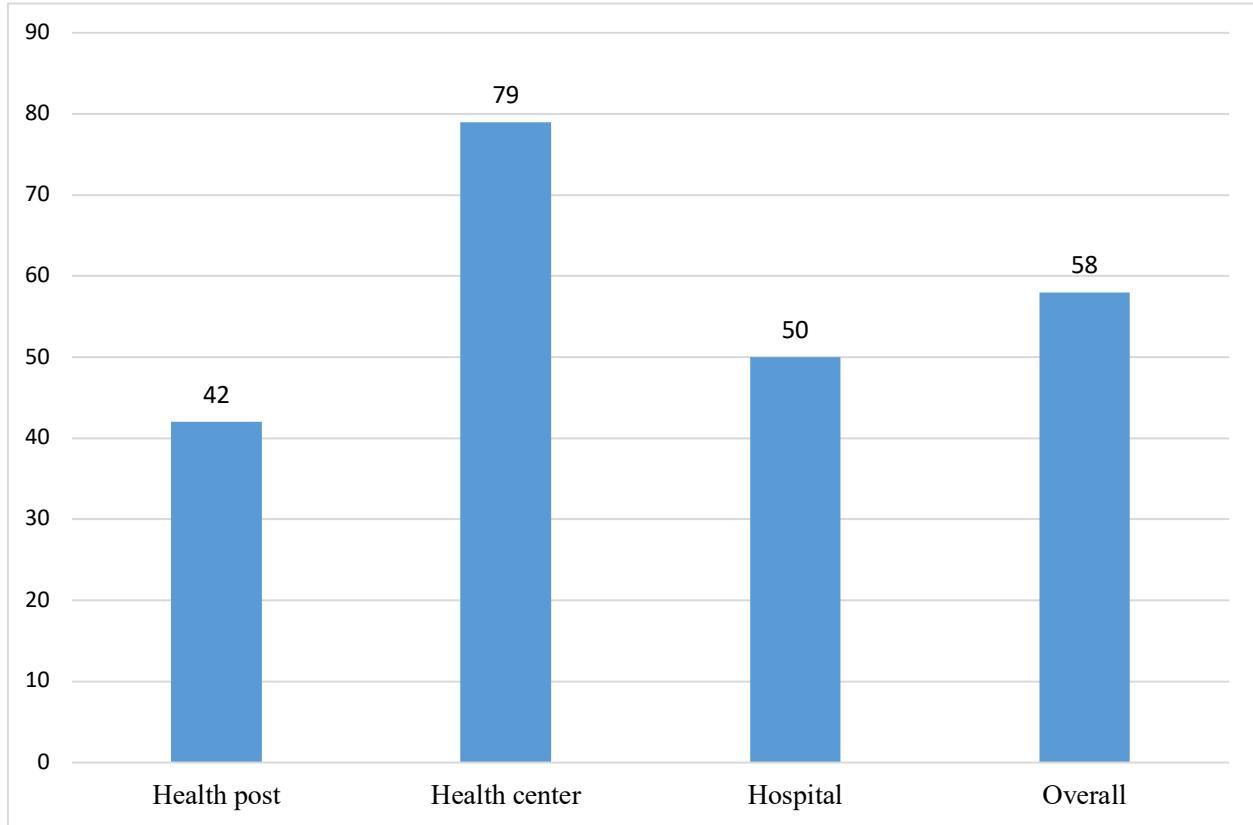
**Figure 1.** Level of Information use, in public health facilities of Sidama, April 2018.



**Figure 2.** The proportion of health facilities' Health Management Information System (HMIS) data, Sidama, April 2018.



**Figure 3.** The proportion of health facilities' Discuss and Decide actions in the Sidama Zone SNNPR, April 2018.



**Figure 4.** Level of information use (%) based on the categories of health facility in the Sidama Zone, April 2018.

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