ORIGINAL ARTICLE

UTILIZATION OF HEALTH INFORMATION SYSTEM AT DISTRICT LEVEL IN JIMMA ZONE OROMIA REGIONAL STATE, SOUTH WEST ETHIOPIA

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ABSTRACT

INTRODUCTION: *Information systems are increasingly important for measuring and improving the quality and coverage of health services. Reliable and timely health information is vital for operational and strategic decision making that save lives and enhances health. In Ethiopia information quality and use remain weak, particularly at district health offices and primary health care facilities to facilitate decision making. Therefore, the objective of this study is to assess the utilization of health information systems at District level in Jimma Zone, southwest Ethiopia.*

METHODS: *A cross sectional study was conducted in all health institutions by interviewing heads/ units/departments of District Health Office, Health Center and Health Post from January to February, 2009. Quantitative and qualitative data were collected using structured questionnaires, check lists, observation and interview guide by trained data collectors. Data was analyzed using SPSS version 16 and descriptive and logistic regression analysis was carried out.*

RESULTS*: The finding of the study revealed that utilization of health information was 119(32.9%) in all the study units/departments. The major source of data was routine and vertical program report from public institutions. The utilization of information was affected by many factors but from variables studied only documentation of data, catchment population profile charts presentation and quarter plan performance monitoring was found significant at 95 % level of significance.*

CONCLUSIONS*: The study identified that the implementation of health data/information and utilization of health information system was found to be far below the national expectation. Activities are poorly coordinated at the districts and primary health units where data was generated initially. Therefore, in-service training and updating of staff involved in health information system (HIS) at district, strengthening health information system inputs, timely and concrete feedbacks with establishment of functional health management information system (HMIS).*

KEY WORDS: *Health Management Information System, utilization of health information at Districts*

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INTRODUCTION

Information systems are increasingly important for measuring and improving the quality and coverage of health services. There is a global shift from curative to preventive care, from hospital care to community and public health care, from centralized to decentralized health care, from a specific project approach to a comprehensive sectoral approach. The restructuring of health information systems (HMIS) has become an important trend in the entire developing world since the adoption of primary health care as a global strategy for achieving 'health for all' goal (1-3).

Data delivered through the HMIS come from service delivery and administrative records kept as part of routine transactions at health facilities and management offices. HMIS is a core building block of the health system as a whole and provides the data needed for others, such as human resources, financing, and service delivery, to perform their functions. Many of the data sources upon which a health information system draws are also used to generate data for other sectors. The decennial census, civil registration system and household surveys are examples of data sources serving multiple sectoral statistical needs (2, 4-6).

Data must be collected, processed and transformed, communicated, and used to inform decisions on resource allocations, policy formulation, staffing, service delivery, cost-recovery, supportive supervision, and other elements working toward improved health outcomes (4, 6-7).

Survey done in Ghana and Uganda indicated that managers at every level throughout the country are expected to regularly monitor their efforts to implement these policies and make informed decision making to achieve their own goals and targets. However the importance of health information systems have increased for community oriented decision making rather than political and bureaucratic supervision (8-10).

In Ethiopia data/information quality and use remain weak, particularly at District Health Offices and primary health care facilities, which have primary responsibility for operational management since 2002. Five strategic issues have been identified as critical to strengthen and continuously improve health sector HMIS/M&E. Capacity building, standardized and integrated data collection and reporting, linkage between information sources, information use, action-oriented performance monitoring and use of appropriate technology (4, 11-12).

Study conducted by Essential Service for Health in Ethiopia (ESHE) in Amhara Regional state reported that, utilization of information at District and health facilities levels was partial and uneven. More systematic, long-term monitoring and data based planning were not inherent at District level (13).

Assessment done in North Gondar revealed that, out of 84.3% 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 year 2005 to 2006. In the first quarter of 2006 about 34.7% of the study units were supervised once and 12.2% of them had given feedbacks (14).

Therefore, this study was designed to greatly signal the current status of HMIS in study area. It can also high light the knowledge on utilization and factors associated with utilization of HMIS and perhaps as an initiative and reference to other researchers in this area. Further, in line with these, it will also contribute to policy decision making in the direction of making Health Information System (HIS) more amenable for better improvement of the health services.

MATERIALS AND METHODS

The study was carried out in Jimma Zone, south west Ethiopia from January to February, 2009. Jimma Zone is one of the seventeen Zones in Oromia Regional State which is situated about 354 kilometers away from Addis Ababa. The zone has a total area of 19,293.5 Square kilo meters. It has 17 Districts and 1 town administration with a total of 545 kebeles (lowest administrative units) of which 515 of them are rural and 30 are urban. According to Ethiopian Population Census Report of 2007, the total population of the Zone excluding Jimma town is 2,495,795 (15).

The Zone has a total of 966 health professional from different disciplines and 117 Health Posts, 20 Health Centers (HCs), and one District hospital owned by government and additionally there are 36 private and 3 NGO clinics, 65 private rural drug venders. The overall potential health service coverage of the Zone by public institutions for year 2008 was 75.5%.

The study used a facility based cross-sectional study. All District Health Offices, government Health Centers and Health Posts in the Zone were the source population for the study. Study population for quantitative study were the head/units/departments of sampled Districts, Health Centers and Health Posts, while for qualitative study the head of the statistics department of Zonal Health Department, Districts and HCs were considered.

Those District Health Offices, Health Centers and Health Posts fully functioning before the year 2006 were included in the study. Those District Health Offices, Health facilities which were not functional as of 2006 were excluded. Based on the inclusion/exclusion criteria; 15 Districts, 14 Health Centers and 30 Health Posts were selected. Ten units/departments from Districts, 13 units/departments from Health Centers and 1unit from Health Posts were identified. For qualitative

study; individuals working in statistics Units in Zonal Health Department, Districts and Health Centers were purposively selected for in-depth interviews and 15 individuals were interviewed.

Six data collectors and one supervisor were recruited out of the study area and trained for 2 days, a week before the final data collection date. Questionnaire was developed after extensive revision of relevant literatures, the questions and statements were grouped and arranged based on particular objectives. The questionnaire was pre-tested out of the study site in two health centers, representing 7.0% of the total study sample size. Qualitative data was collected after the quantitative data collection using interview guides by principal investigator and supervisor. Data collection instruments; interview guides for qualitative study, structured questionnaire and observational checklists were employed for quantitative study.

In this study data quality was determined by completeness, timeliness and feedbacks. Similarly data quality assurance was checked by cross checking of tallies with recorded and reported figures, completeness and timeliness of reports. So, the units/departments were considered as assured the quality of data when used at least two of the above mentioned criteria's. Utilization of health information system was assessed by using information for decision making to take immediate action such as feedback from respective supervisors, calculation of area coverage and preparation of maps, presentation of key indicators with charts or tables and presentation of achievements of targets. Based on these criteria the units /departments were considered as utilized health information system when they practiced minimum three of them.

Quantitative data were checked, entered, and analyzed using SPSS for window version 16. Descriptive analysis for utilization of information with socio-demographic and between some key variables was done and logistic regression analysis was carried out. Data was described and presented using tables, charts and graphs. Odd ratio with 95 percent confidence interval and 5% level of precision were used for data interpretation. Qualitative data collected during field visits were coded and analyzed as per themes emerged. Finally descriptive summaries were made based on, what participants described. They were used as supplementation for quantitative data to verify events.

Data collection instruments were translated from English to local language (Affan Oromo) and retranslation was done. Data collectors were trained, pretest and close supervision was carried out. About10% of collected samples was rechecked on daily basis by supervisor and investigator.

The study was conducted after getting approval from Jimma University Public Health Faculty. Official letter was sent to the Zonal Health Office, and data was collected after getting permission from the concerned offices. Informed verbal consent was obtained from all study subjects. Each study subjects were briefed about the objective of the study and privacy and anonymity were maintained during interview and use of data.

RESULTS

A total of 362 heads of the units/departments composed of 10 from the Districts, 13 From Health Centers and one unit from each Health Posts were participated in this study (Table 1).

Table1. Distribution of units/departments at Districts, Health Centers and Health Posts in Jimma Zone, April, 2009 Units/Departments Frequency Percent

Units/Departments(n=362)	Number	Percent
Head of Districts	15	4.14
Health program	15	4.14
Health service	15	4.14
H/Environmental	15	4.14
HIV/AIDS	15	4.14
Malaria & other vector born disease	15	4.14
MCH	15	4.14
EPI/Cold chain Mgt	15	4.14
Statistics	15	4.14
TBL(Tuberculosis and Leprosy)	15	4.14
Subtotal A Department of District	**150**	**41.4**
Head of Health centers	14	3.87
Pharmacy	14	3.87
under 5 OPD	14	3.87
Adult OPD	14	3.87
ANC/PMTC	14	3.87
Delivery	14	3.87
Emergency	14	3.87
Laboratory	14	3.87
EPI	14	3.87
TBL	14	3.87
F/Planning	14	3.87
Statistics	14	3.87
VCT/ART	14	3.87
Subtotal B Department of Health center	**182**	**50.31**
Health posts	30	8.29
Subtotal C Unit of Health Post	**30**	**8.29**
Total	**362**	**100**

The sex distribution of participants in the study units showed that 228(63.0%) were males while 134(37.0%) were females. Among the respondent 151(41.7%) were within the age range of 25- 29 years old with mean (SD) age of 27.93(±6.2). About 155(42.8%) of respondent have salary ranging from 801 to 1200 Eth. Birr per month and 178(49.2%) of them had 1 to 5 service years.

Regarding level of education, from the total interviewed individuals, those with diploma constituted 248(68.5%) and 48(13.3%) with BSc degrees. Thirty (8.0%) were 10th complete (Health extension workers) and 30(8.0%) were 10th and 12th complete administrative and supportive staffs. The rest 6(1.7 %) were junior technical staff.

The major sources of data and health information in the study area were routine reports from public health institutions and their registration books of facilities and administrative record of District Offices. Routine reports such as monthly, quarterly, annual reports, and weekly notifyable diseases including Integrated Disease Surveillance Report (IDSR), and vertical program like malaria, TB and leprosy, HIV/AIDS programs reported from facilities and District Health Offices.

All the data collection tools (tallies, report formats of monthly, quarterly, reporting forms and registrations) were filled manually in all the study units/departments.

From the total interviewed (332) staff of Health Centers and District Offices, 236(71.0%) reported they filled the format properly. The rest complains that they did not understand the tools/formats due to non understandability, ambiguity and they didn't have any training supports.

At the facility level, HMIS reports were covered a single month, as per the Ethiopian calendar. Monthly results, along with quarter totals, are forwarded onwards each quarter. According to HMIS reference guideline of Southern Nations, Nationalities and Peoples Region (SNNPR), each Health Posts sends their report within 20th to 22nd days of the month to their Districts and Health Centers should sent their report within 20th to 24th days of the month to the Districts. Where as the District reported within 24th to 27th days of each month to the Zonal Health Department. During this assessment, it was found that, 14(46.0%) unit of Health Posts, 70(38.46%) units/departments of Health Centers and 54(36.0%) departments of Districts reported within their schedules (Fig 1).
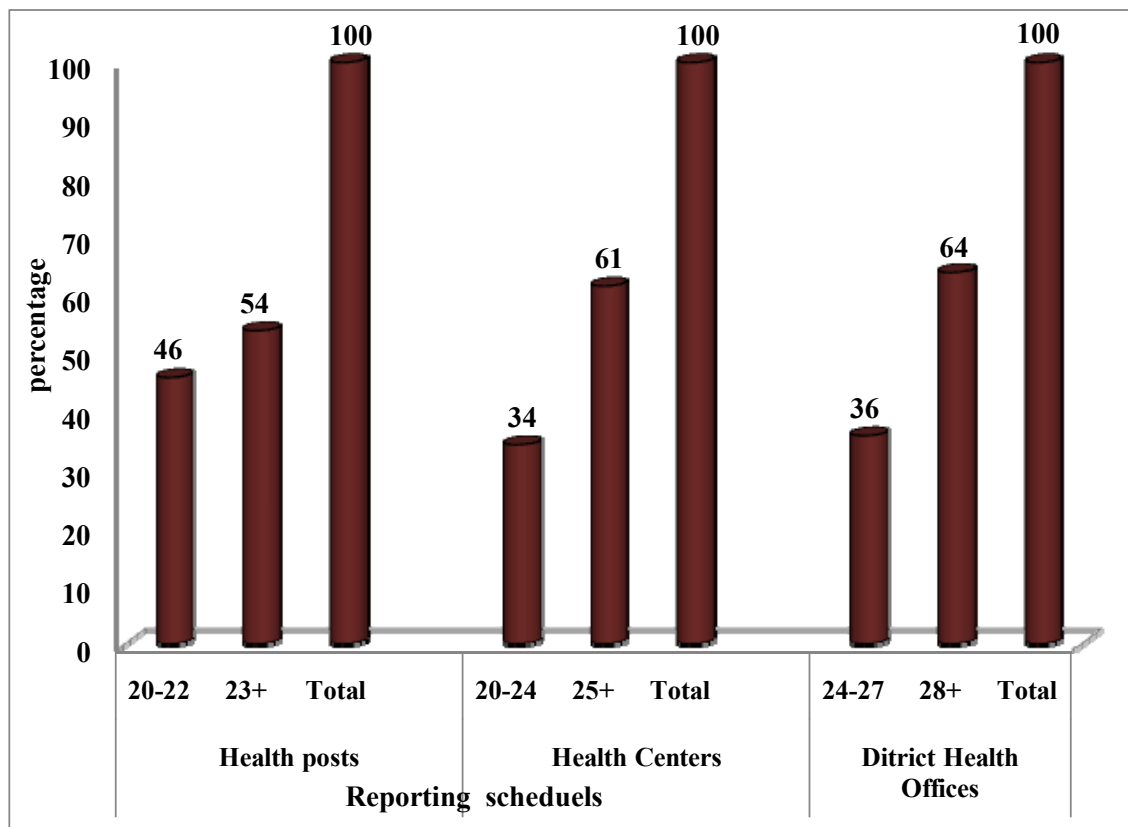

Figure 1. Schedule of reporting HMIS data by units/departments of Health Posts, Health Centers and   District Health Offices in Jimma Zone, April 2009

Among 332 individuals participated from Health Center and District units/departments 127(38.3%) revealed inconsistency of reports and 86(26.0%) ambiguity of the report formats and International Classification of Disease (ICD) codes. Moreover, 78(23.5%) of them mentioned that the formats were not updated and does not consider newly emerging diseases. In addition, 38(11.2%) of them claimed that the formats were incomplete and redundancy like reporting by different formats to different bodies, while 3(1.0%) of them complained lack of supportive supervisions and timely feedbacks.

The study identified how the units/departments of Health Centers and District Offices keep their data and their records in 2006 and 2007. Out of the total 332 observed units/departments, 236(71.0%) keep their reports and registrations in well organized hard copy form. Seventy nine (24.0%) units/departments did not have well organized data, while 17(5.0%) secured data in both hard and soft copy form (Fig 2).
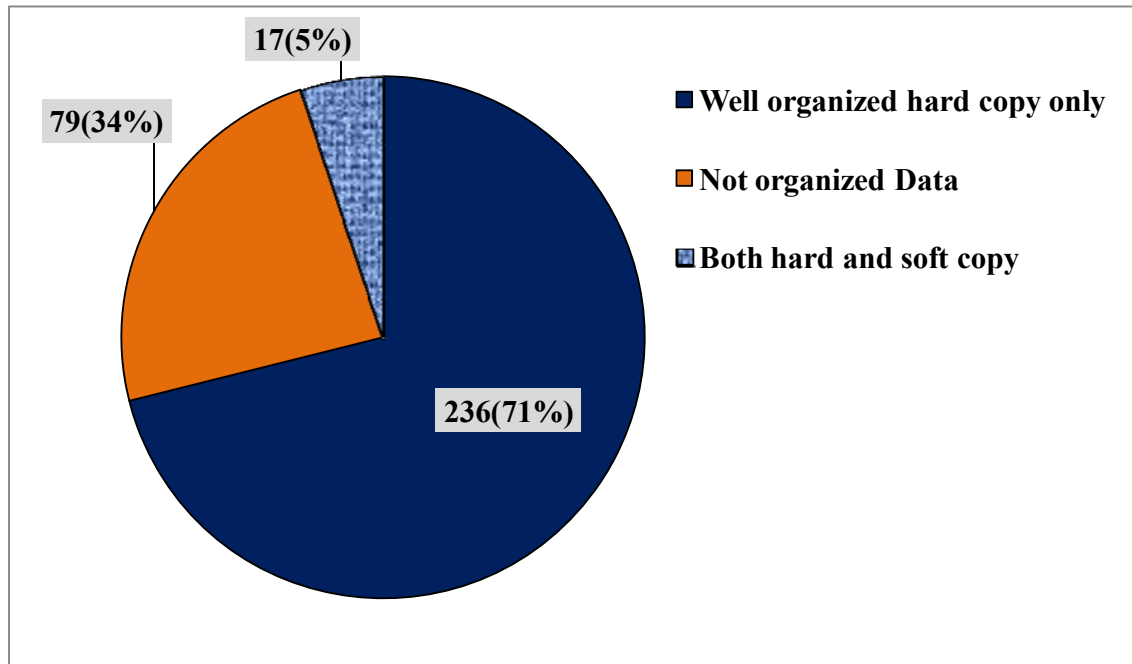
Figure 2. Observation of documentation of reports and registration books at the Health
Centers and   District health offices in Jimma Zone, April 2009

Among 332 individuals from Health Centers and District Offices interviewed to assess their feelings on data generation 170(51.2%) reported that there was lack of training and technical support on HMIS, 91(27.4%) complained lack of computer skills and unavailability of computer, while 71(21.4%) claimed inconsistency and incompleteness of the reports.

In the first quarter of 2009, out of 182 units/departments of the Health Centers 93(51.1%) were visited at least once by their Districts. Similarly among 150 units/departments of District Health Offices 130(87.0%), were supervised

minimum once by the Zonal Health Department. However supervisions feedbacks were given orally in the visit and District review meeting for 91(50.0%) units/departments of Health Centers. In the case of District Health Offices feedbacks was given orally in the visit and Zonal review meeting.

Based on the set criteria, the utilization of collected health data/information at units/departments were 8(26.7%), 57(31.3%) and 54(36.0%) for Health Posts, Health Centers and District Health Offices respectively. The cumulative utilization of data in study area was 119(32.9%) (Fig 3).

Figure 3: Utilization of health data/information in the units/departements in District Offices of Jimma zone, April 2009
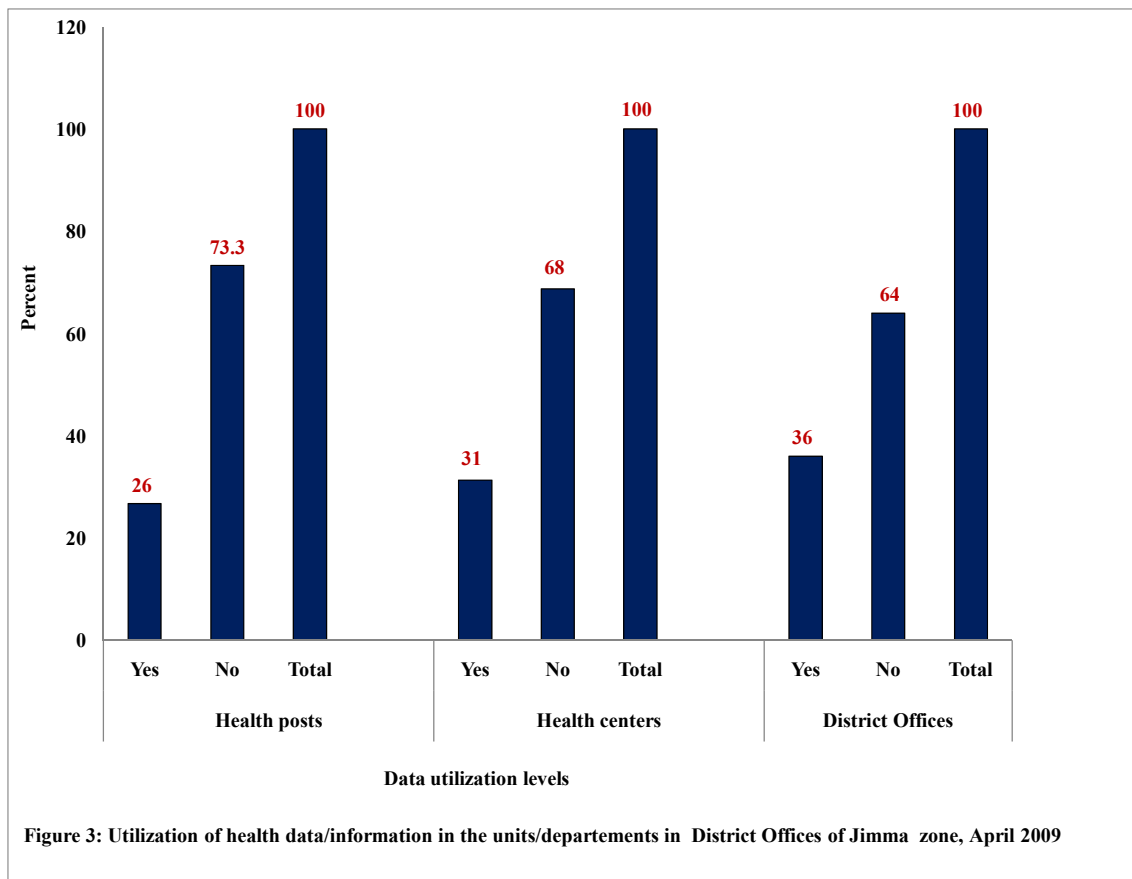
Majority of the staffs feel that analysis and direct utilization of health data/information were left for higher levels and their duty were only collecting and passing the data to the next levels.

 '…we are playing data relay because in most cases we are concerned how to take and pass to the next levels all the times….' a 39 years old male statistics unit worker from district health office.

Among 182 units/departments of Health Centers, only 5(3.0%) had computers. While from the total of 150 units/departments of Districts Health Offices except 10(7.0%) all of them had at least one computer. However all the facilities compiled, analyzed and calculate the coverage of different essential services manually. Even those which had computers lacked skilled personnel. Only three of the districts head found with backup their reports in soft copy by the assistance of their secretary.

Utilizations of information were computed with socio-demographic characteristics such as sex, age, salary, professions and service years of individuals using descriptive statistics and binary logistic regression to see their association. In descriptive, chi-square tests salary and service years were significant. However by the logistic regression test none of them were found statistically significant (Table 2).

Table 2. Socio-demographic characteristics and utilization of health data/information at units and Departments of District Health Offices, Health Centers and Health Posts in Jimma zone, April 2009

Variables	Utilization of information	Yes	No	Crude OR (95% CI)	Adjusted OR (95% CI)
Sex distributions	Male	76	152	1.06(0.67,1.67)	1.12(0.56,2.24)
(N=362)	Female	43	91		
				1.00	1.00
Age	20-24	43	78	0.84(0.53,1.33)	2.42(00,-)
(N=362)	25-29	41	110	1.57 (1.0,2.48)	1.70(00,-)
	30-34	11	24	1.16(0.51,2.28)	3.54(00,-)
	35-39	11	16	0.69(0.31,1.54)	1.12(00,-)
	40-44	10	11	0.52(0.21,1.25)	8.40(00,-)
	45+	3	4	0.52(0.14,2.94)	-
				1.00	1.00
Salary	400-800	22	33	0.69(0.38,1.25)	00(00,-)
per months	801-1200	46	109	1.29(0.83,2.02)	00(00,-)
(N=362)	1201-1600	14	62	2.57(1.37,4.81)	00(00,-)
	1601-2000	36	39	0.44(0.26,0.74)	00(00,-)
	2001+	1	0	0.33(0.28,0.38)	-
				1.00	1.00
Profession	First degree	18	30	1.27(0.67,2.38)	0.61(0.22,1.64)
(N=362)	Diploma	72	176	1.72(1.08,2.72)	1.13(0.48,2.64)
	Juniors	6	0	0.32(0.27,0.37)	4.44(00,-)
	10th /12th complete	15	15	0.46(0.22,0.97)	2.75(0.93,8.10)
	HEW	8	22	1.38(0.60,3.20)	-
				1.00	1.00
Service years	1-5	62	116	0.84(0.54,1.30)	0.53(0.07,3.89)
	6-10	28	74	1.42(0.86,2.36)	0.38(0.05,2.82)
(N=362)	11-15	9	23	1.28(0.57,2.86)	0.39(0.05,3.22)
	16-20	10	20	0.98(0.44,2.16)	0.50(0.06,4.09)
	21-25	8	8	0.47(0.17,1.29)	1.00(0.11,8.95)
	26^{+}	2	2	0.49(0.07, 3.49)	-
				1.00	1.00

Key: OR – Odds Ratio
     CI - Confidence Interval

In this study we tried to look for the relation between some selected variables and utilization of information and documentation of data both hard and soft copies, availability of catchment profiles, availability of quarter plan and performance, and availability of chart of prevalence of malaria were statistically significant in logistic regressions (Table 3).

Table 3. Relationship between selected variables and utilization of information at units/departments of district health office, health centers and health posts in Jimma zone, April 2009.

Variables		Utilization of Information		Crude OR (95% CI)	Adjusted OR (95% CI)
		Yes	No		
Knowledge on Data Collection Tools(N=332)$^{\Omega}$	Yes	132	63	1.08(0.65, 1.78)	1.00(0.58, 1.73)
	No	104	33	1.00	1.00
How HMIS was documented (N=332) $^{\Omega}$	Well organized Hard copy	77	159	1.13(0.69, 1.87) 1.00	1.28(0.68, 2.39) 1.00
	Both hard and Soft copy	14	3	0.15(0.03, 0.34) 1.00	10.69(2.53, 45.23)$^{\odot}$ 1.00
	Not organized Hard copy	20	59	1.66(0.94, 2.93) 1.00	- -
Conducting supervisions In the first quarter of 2001 E.C (N=332) $^{\Omega}$	Yes	80	115	1.26(0.88, 1.99)	1.09(0.47, 2.55)
	No	66	71	1.00	1.00
Feedback from their Next higher levels (N=332)$^{\Omega}$	Yes	111	84	1.28(0.81,2.02)	1.01(0.43, 2.60)
	No	61	76	1.00	1.00
Availability of supervision visit books (N=332) $^{\Omega}$	Yes	8	3	0.76(0.199, 2.92)	11.4(0.29, 15.85)
	No	99	152	1.00	1.00
Availability of key indicators by charts &tables (N=362) $^{\clubsuit}$	Yes	169	87	56(1.06, 2.93)	0.71 (0.37, 1.39)
	No	38	68	1.00	1.00
Continuous quality Assurance of data (N=332) $^{\Omega}$	Yes	26	66	0.83(0.499, 1.39)	1.20(0.721, 2.01)
	No	82	155	1.00	1.00
Availability of Catchment Population profiles Charts (N=362) $^{\clubsuit}$	Yes	112	53	1.09(0.77, 1.71)	2.52(1.086, 5.85)$^{\odot}$
	No	95	155	1.00	1.00
Availability of Quarter plan and performance (N=362) $^{\clubsuit}$	Yes	89	67	1.64(1.05, 2,55)	0.43(0.22, 0.85)$^{\odot}$
	No	118	88	1.00	1.00
Availability of routine report submission check lists (N=362) $^{\clubsuit}$	Yes	186	146	1.28(0.81, 2.02)	1.06(0.43, 2.60)
	No	21	9	1.00	1.00
Availability of Ten top Morbidity (N=332)$^{\Omega}$	Yes	70	36	0.80 (0.34, 1.88)	0.65(0. 31, 1.35)
	No	137	119	1.00	1.00
Availability of EPI Monitoring charts (N=332) $^{\Omega}$	Yes	111	84	1.42 (0.85, 2.37)	0.96(0.28, 2.13)
	No	61	76	1.00	1.00
Availability of Charts on Prevalence Of malaria (N=362) $^{\clubsuit}$	Yes	17	144	0.80 (0.34, 1.88)	3.77 (1.12, 12.71) $^{\odot}$
	No	190	155	1.00	1.00

Key: OR - odds ratio

CI - confident intervals

$^{\odot}$ - Significance at (p-value 0.05)

$^{\Omega}$ - Those units/departments from HCs and District

$^{\clubsuit}$ - Those units/departments from HPs, HCs and Districts

DISCUSSION

The overall utilization of information in the study area was about 32.9% which is higher as compared to the study in Ghana and Uganda which was 10% and 20 % respectively in 2005(9,10) and 22.5%, in the study conducted in North Gondar in 2006 (14). The survey conducted by Essential Services of Health for Ethiopia in Amhara Regional state reported that utilization of information at district and health facilities level was partial and uneven (13). The increment in this study is due to frequent supervision and follow-up down to the Health Posts.

One of the major challenges to use data for decision-making is its timeliness and appropriateness. According to HMIS Reference Guideline of Southern Nations, Nationalities and Peoples Region (19) in this assessment, 46%, 38.46% and 36% units/departments of Health Posts, of Health Centers, and of District Health Offices respectively reported to their next levels. Meanwhile overall 38.12% of health institutions reported according to their respective schedule. The study conducted in North Gondar, showed that 33.90% and 38.36% of the units/departments at the Health Centers and District Health Offices respectively reported within their schedules (14). Study conducted in Uganda, showed that an average 88% of the Districts reported in their schedules (16). The study conducted in Papua New Guinea showed that in 2004 reporting rates were 73% (17).

This study was comparable to that of the North Gondar, however majority of the reports arrives late, and the delay was significant upward from Health Posts to Districts. This is due to loss of timely concrete feedbacks, scarcity and non standardized tools, lack of HMIS guidelines, manually filled formats, absence of access for data network/means of data transmission, lack of commitments by the staff.

In this assessment data handling was observed, in 2007 to 2008 and over all 71% of the data was documented in the form of hard copy, 24% was not well documented while 5% had data in both hard and soft copy form. Documentation of data with utilization of information was statistically significant at P = 0.001, AOR = 10.685 and 95% CI: (2.525, 45.227). According to study conducted in Tanzania and Mozambique reported that (93%) of the data registers were not available all the time (18). The North Gondar study showed that in the year 2005 to2006, 28% of the data were not available, 58% not well documented and 13.2 % well documented (14).

Relatively data handling of the study area was observed better than their findings this is due to the reason that most of the Districts had tried to duplicate formats for their facilities. Though the reports were sent late there is trend of continuous follow-up and performance audits of facilities at District level and this has resulted positive effects on data handling.

In this study it was found that 8(26.7%), 57(31.3%) and 54(36.0%) units/departments of Health Posts, Health Centers and District Offices respectively tried to change data into information, while cumulatively, (32.9%) units/departments of health facilities used their data/information for decision making, planning, budget and M&E of their activities. The study conducted in North Gondar, showed that out of 45 HIV/AIDS units only 17.7% changed their data into information at District and facility level, and used for immediate decision making (14). The finding of the study area appears to be better as compared to that of the North Gondar. This is due to the fact that this study employed cumulative ratio which include EPI and family health services and vertical programs like malaria, HIV/AIDS and TBL services. However in both cases the utilization of health information was very far below that of 75% which is the national expectation.

The result of this study indicated that, data/information generated at the health institution and District level from routine reports and vertical programs/activities. All the data was collected using manually filled formats and registrations and only hard copy were sent to the next levels.

The study confirmed that poorly coordinated processes, no capacity building activities on HMIS absence of supplies like guidelines, and lack of interaction with private, NGOs and other sectors. Data production, documentation and transfer were not fully supported by information technologies. The study also identified that data were provided by the lower levels of the health system and most often analyzed at the top/central levels. This practice is paradoxical in the context of decentralization which increases the demand of data for decision-making at the districts and facilities.

Therefore, continuous in-service training and updating of the staffs involved in HIS at District Offices, facilities and stakeholders needs urgent attention for better understanding and support of HMIS. Utilization of standardized data tools like tally sheet, registers and formats should get emphasis in order to assure standard source and ensure data quality at all levels.

Strengthening health information system inputs, like information technology, and skilled workforce is essential to improve information systems by using electronic data managements. District offices and facilities should get guidelines of HMIS. Moreover sustained efforts for supportive supervisions with timely and concrete feedbacks are required with establishment of functional HMIS review team at Districts and facilities.

ACKNOWEDGEMENTS

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