ASSESSING THE KNOWLEDGE, ATTITUDE AND PRACTICE OF HEALTH CARE PROVIDERS TOWARDS HEALTH MANAGEMENT INFORMATION SYSTEM (HMIS) IN MUNDRI WEST COUNTY, SOUTH SUDAN.

BY

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ABSTRACT

The Health Management Information System is crucial for evidence-based policy-making, informed decision-making during planning, implementation and evaluation of health programs; and for appropriate use of resources at all levels of the health system. This study explored the knowledge, attitude and practice of health care providers with the aim of improving the health sector in South Sudan. A cross sectional study was conducted in 19 heath facilities in Mundri West County between February and March 2015. A questionnaire was used to interview 73 health care providers on their knowledge, attitude, practice and factors for change on Health Management Information System and booklets from these facilities were reviewed for triangulation. Of all respondents, 82.2% had never been trained on Health Management Information System, 64.4% did not properly define this system, 52.1% didn't know who is supposed to use the information collected and 46.6% did not use the collected data for planning, budgeting and evaluation of services provision. Although the attitude towards the system was positive among 91.8%, the reviewed Health Management Information System booklets were never completed in 57.5% of the facilities. The most common type of booklets never filled were those for deliveries. The gaps in the current Health Management Information System were linked to lack of training, inactive supervision, staff workload pressure and the lengthy and laborious nature of the system. This research shows a state of poor health data collection, lack of informed decision making at the facility level and the factors for change in the county's Health Management Information System. It suggests need for new innovations as well as its incorporation of Health Management Information System in the continuing reviews of the curricula for all cadres of health care providers and development of more user-friendly system.

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ABBREVIATIONS AND ACRONYMS

HMIS:	Health Management Information System
PH:	Public Health
WHO:	World Health Organisation
M & E:	Monitoring and Evaluation
MoH:	Ministry of Health
AMREF:	African Medical and Research Foundation
NGOs:	Non Governmental Organizations
UN:	United Nations
FBOs:	Faith Based Organizations
DHIS:	District Health Information System
CHD:	County Health Department
SMoH:	State Ministry of Health
WES:	Western Equatoria State
RSS:	Republic of South Sudan
CPA:	Comprehensive Peace Agreement
CHMT:	Council Health Management Team
CHWs:	Community Health Workers
SPs:	Supporting Partners
HIS:	Health Information System
PHCC:	Primary Health Care Centre
PHCU:	Primary Health Care Unit
GOSS:	Government of South Sudan
CIP:	County Implementing Partner

MCHW:	Maternal Child Health Worker
DPT:	Diptheria, Pertussis and Tetanus Toxoid
VDRL:	Veneral Disease Research Laboratory (test for syphilis)
TT:	Tetanus Toxoid
BPHS:	Basic Package for Health Services
BCG:	Bacille Calmette-Guérin (Tuberculosis) Vaccine
ANC	Antenatal Care
PNC:	Postnatal Care
MUAC:	Mid-Upper Arm Circumference
OPD:	Out Patients Department

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CHAPTER 1: INTRODUCTION

1.1 Brief background

A health management information system (HMIS) is a process whereby health data are recorded, stored and processed for policy-making, planning, implementation and evaluation of health programs. The system is crucial for evidence-based policy and informed decision-making at all levels from national down to the institutional levels (Nyamtema, 2010). Evidence-based decision making is seriously important for the appropriate use of scarce resources chiefly in resource limited countries like South Sudan. The HMIS in a good number of developing countries are inefficient and are greatly affected by unreliability of data resulting from underreporting (Evans et al, 2003). Reports from sub Saharan Africa specify that vital health decisions, in this context, are made based on crude estimates of disease and treatment burdens (WHO, 1997). Findings from this region indicate that the problem of under reporting is huge and is linked to lack of knowledge and practice amongst the health workers characterized by insufficient analysis skills, training and lack of initiative for using information (Mshana, 2004).

South Sudan has recently acquired statehood. Planning and management of the health care system, based on evidence, requires a constant flow of information from health services. The Division of Monitoring and Evaluation (M&E) of the Ministry of Health developed the framework for the health sector of the country in 2008. At that time data were collected through surveys and assessments. (Laku R. et.al, 2012)

Two health system assessments conducted in 2007 and 2009 in South Sudan highlighted the absence of a working routine HMIS. An M&E Scoping Mission conducted in March 2010 noted the lack of tools and procedures for data collection, the inconsistent data flow and the limited capacity for analysis and use of data for action at all levels of the system. A plan to develop the system based on the '3-ones' strategy (one database, one monitoring system, one leadership) was put in place under the leadership of the Ministry of Health (MOH). The MOH has since developed, tested and refined the tools and procedures for the routine HMIS, produced a comprehensive roll out plan and started the integration of health programmes into the system (Laku et.al, 2012).

The idea of this study is based on the concerns about the poor quality data and inadequate integration of the HMIS despite a number of changes it has undergone since inception and the need to bridge the gaps in the on-going changes in health sector and efforts by the government of South Sudan to optimize the performance of health services at all levels of administration through the timely provision of necessary and sufficient information needed by the health managers to monitor, evaluate and plan their activities in order to accelerate provision of quality primary health care services to all.

1.2 Problem statement

South Sudan is a country coming out of more than two decades of civil war and has a history of marginalization and under development (Laku et.al, 2012). The country has a formidable task in rebuilding a government led health service and improving some of the worst health indicators in the world like Infant mortality is extremely high at 150 deaths per 1,000 live births, maternal mortality ratio estimated at 2,054 maternal deaths per 100,000 live births. There are extremely high rates of teenage pregnancies (300 per 1,000 females aged 15-19). These tell how the health service gap in South Sudan is dire. Preventable and treatable diseases are the leading causes of illnesses and deaths (AMREF, 2014).

In March 2010, a rapid assessment took place in south Sudan to assess the status of the routine Health Management Information System (HMIS). The conclusions were sobering showing that there was not a functional system in place. According to the assessment, data collection was piecemeal and in various formats; the list of indicators to collect were not defined and at times irrelevant reports (when available) were not completed and, when completed, were not understood by the health staff. Furthermore there was a lack of understanding by health workers of basic concepts of data collection, analysis and feedback. Lastly, the majority of available data has been collected through surveys (Multi-Indicator Cluster Survey 2009, Health Facility Mapping 2010) and specific reports from health facilities to health partners such as NGOs, UN bodies and donors. (Carmen et.al, 2010)

Development of the national health information system was also further complicated by fragmented external support as evidenced by 216 health projects implemented through 148 NGOs/FBOS. Each of them with their particular reporting system, such fragmentation

undermined an integrated data collection approach, due to divergent NGO and donor requirements. In addition, NGOs supported systems development at the county-level through management training, support on data collection and data analysis but based on their separate understandings of needs rather than on an integrated approach to support the MoH to track progress (Rajkotia et.al, 2007).

The participatory process to develop the strategic plan of the health care sector of South Sudan highlighted the need for integration of the data collection for relevant information to reach decision makers. The MoH then started the daunting process of building the system. Two actions took place immediately: firstly, the identification of a basic list of "what to collect" (indicators) and the adaptation to the context of data collection tools Secondly, the MoH decided to use a tried-and-tested database, the District Health Information Software (DHIS) as the software for the South Sudan health care system (Ali et.al, 2011).

Despite all the above efforts across the management levels such as; County Health Department (CHD), State Ministry of Health (SMoH) and national MoH; data flow remains a challenge since most times counties and states were bypassed, integration of all reports into MOH system to reduce duplication and workload to health facilities and counties staffs and still get all information needed for action remains a dream and deficit of equipment and tools in rural areas and capacity of and support for the health facility staffs are still an uphill road. It is against these challenges that the study is undertaken to assess the knowledge, attitude and practices of health care providers towards HMIS in Mundri West County with the view that the results of the study may derive solutions to the above challenges so that high quality health data is generated to make good public health decisions which will ultimately save lives and improve the health of the people that use the health facilities daily.

1.3 Research questions

What is the level of knowledge of health care providers on HMIS in Mundri West County, South Sudan?
What is the attitude of health care providers towards HMIS in Mundri West County, South Sudan?

What are the common HMIS practices amongst the health care providers in Mundri West County, South Sudan?

1.4 Research objectives

Broad Objectives

To assess the knowledge, attitude and practice of health care providers towards HMIS in Mundri West County, South Sudan

Specific Objectives

T o assess the knowledge of health care providers on HMIS in mundri west county, South Sudan. To assess the attitude of health care providers towards HMIS in mundri west county, South Sudan
To establish the practices concerning HMIS amongst the health care providers in mundri west county, South Sudan

1.5 Significance of study (Justification)

The study results may help health care providers use the HMIS data collected at the health facility level for planning, budgeting and evaluation of services provision.

This study may be of value in appropriate allocation and use of resources at all levels of the health system in Mundri West County.

The findings may help identify the training needs of the health care providers on HMIS in order to improve data generation and management in the health facilities of Mundri West County through capacity building of the health care providers.

The findings may help CHD/MOH to develop strategies of improving data collection, entry, analysis and feedback on HMIS hence ensuring data flow without bypassing the data management levels.

The study results may help policy makers / MOH to come up with strategies to fill the HMIS gaps in mundri West County, WES, ROSS.

1.6 Operational definitions

Health management information system (HMIS); a system in which health data is collected in quantitative and qualitative form and processed, analyzed, interpreted, disseminated to improve the provision of health services in accordance to priorities identified (RSS MOH, 2011)

Health care providers; are qualified individuals in public health facilities in mundri west county who provides health services to health care consumers.

CHAPTER 2: LITERATURE REVIEW

The signing of the Comprehensive Peace Agreement (CPA) in 2005, which led to a referendum in 2010 and the creation of a new country in 2011, represented the start of South Sudan developing a health service again and building this from almost nothing. However, the development of a HMIS could not happen overnight. (Laku et.al, 2012)

2.1 Knowledge of health care providers on HMIS

Generally, there is limited awareness of the importance of HMIS and its use. This is reflected by the absence of a system aimed at evaluating the accuracy of the information collected by the health units since 1/3 do not use performance. And / or cost monitoring indicators. (Mazzaccara et.al, 2005).

Trainings; In south Sudan there is shortage of skilled personnel with the exception of few high level cadres. Almost all health care providers need intensive training and upgrading as a consequence of both the short and poor quality of their training and year of practice in difficult circumstances. (Mazzaccara et.al, 2005).

Evans et.al, 2013 stated that "HMIS in most developing countries like South Sudan are inefficient and are greatly affected by unreliability of data resulting from under-reporting. findings from this region indicate that the problem of under reporting is huge and is linked to lack of knowledge and practice among the health care providers characterized by insufficient analysis skills, training and lack of initiative for using information (Mshana, 2004).

Given the above findings, reports from sub Saharan Africa indicate that vital health decisions, in this context, are made based on crude estimates of disease and treatment burdens (WHO, 1997).

Supervision; There is weakness of monitoring and supervision (WHO 2004); hence inadequate support supervision on data analysis and utilization of the outputs for planning, forecasting drug or vaccine needs and response to disease outbreaks. (Rajkotia, 2007)

According to study done by Simba et.al 2006 in Tanzania, Supervision, regardless of the reported duration, had been shown to have no relationship with improved data completion. This raises some doubts on the quality of supervision provided by Council Health Management Team (CHMT) to the health facility worker. Except for monitoring the number of visits made by

members of the CHMT to the facilities, there is no mechanism for measuring and monitoring the quality of supervision at health facilities as well as at district level. Thus the ones of ensuring that supervision is done effectively, is left to supervisor (Simba et.al, 2006). It is also probably a manifestation of unwillingness to fill in the forms and lack of commitment and accountability of the poorly supervised health worker. (Simba et.al, 2006)

Education level; the training level of the health personnel both in the county and in the hospital is generally basic and there is low attitude of health workers towards attending Continuing Education courses. (MOH, 2001)

Language; In a quest to improve the HMIS in South Sudan, in 2008, the first version was produced in English but after testing and realizing that the users had limited commands in the language, it was therefore technically changed to Arabic in 2013. The version involved manual data entry into the HMIS booklets. The system covers all health programs and health care services, and requires all health facilities, regardless of ownership, to use this system and report to the County Health Department (CHD) on monthly basis. The overall goal of the system is to optimize the performance of health services at all levels of administration through the timely provision of necessary and sufficient information needed by the health managers to monitor, evaluate and plan their activities. Its success requires a system that is integrated, decentralized, functional and reliable (Health mapping, 2011).

2.2 Attitude of health care providers on HMIS

The current system is based upon health facilities with minimal use of the information at the community level, Low availability of registration books and formats. (Rajkotia, 2007)

The availability of HMIS tools; (forms, patient cards, databases, and manuals) needs further strengthening. Provision of these tools by the MOH seems not to be sustainable as there are frequent shortages. (MOH, 2001)

Workload; HMIS tools form the backbone of the system. It constitutes multitudes of paper tools (request forms, registers, databases and manuals), each containing a specific set of programme information (morbidity, family planning, immunization, equipment inventory, drug available etc). Health workers at the lower levels were supposed to record and compile separately a

number of forms before forwarding them to the centre. Data on deaths in health facilities and inpatient services were supposed to be compiled and reported on an annual basis. Due to the big number of forms and registers, health workers spent a lot of time and effort on tallying and summarizing the different data items and the accuracy of the reports would be jeopardized in the process. The process was labour intensive. Similarly reports would take months to move from the health centres to the districts and finally to the several departments within the MOH. (Kintu et.al, 2004)

2.3 Practices of health care providers on HMIS

South Sudan being a low resourced country after gaining its independence, HMIS sector faced a number of challenges such as; limited computers for data storage, no electricity, limited coverage of cellular networks, no doctors as clinics were basically managed by CHWs, poor road network to most of health facilities and limited capacity building. (Oren, 2014)

MOH been in its infancy, there was not a coordinated approach to collect and report information from health services. Stakeholders 'did their own thing', created their own tools and procedures to collect, transmit and analyze data from health services to their head offices or donors. (Laku et.al, 2012)

Overall, the functioning of the HMIS is limited. Data from health facilities are not always complete or reliable, data collection is delayed and feedback to collecting facilities from MOH, SMOH and CHDs is practically non-existent. FBOs in general comply with national information systems, but many NGOs and private agencies often do not provide required data or information. Disease surveillance is still at infancy. Operational research is under-funded. In general, data are not analyzed, organized or presented in a user friendly way. Interpretation is difficult and therefore there is limited use of data for health planning. Health workers are inadequately trained in all aspects of the data cycle. (Dr Manoja, 2011)

Every person's clinic visit has to be entered into register book and tally's one by one each of the indicators needed in the monthly report in order to get population level data each month, this method to collect health information is arduous and labour intensive. Tallying can take hours each month to complete and often the accuracy of tallying is faulty. Not every facility can deliver the monthly reports on time as the distances are far and the facility is responsible for

funding the delivery of the monthly report to the County Health Department. Most facilities do not have the personal funds to make these deliveries. Some can't even reach the County Health Department as the roads are washed out in the rainy season. (Oren, 2012)

The heavy workload on the few staffs at the health facility, inadequate knowledge of health care staffs on HMIS and complexity of HMIS tools are blamed for not using HMIS. (WHO, 2004)

The data flow (Figure1) follows the management lines of the health care system: Health facilities collect numerical indicators on paper for the CHD; Counties enter data into the DHIS, calculate coverage indicators and send reports to the SMOH, Then SMOH aggregate counties results and send State indicators to the central level.

NGOs operating at county level report to Counties; if operating at State level they send reports to the SMOH M&E Department. Feedback follows an inverse path: from MOH to SMOH, County Health Departments and health facilities.
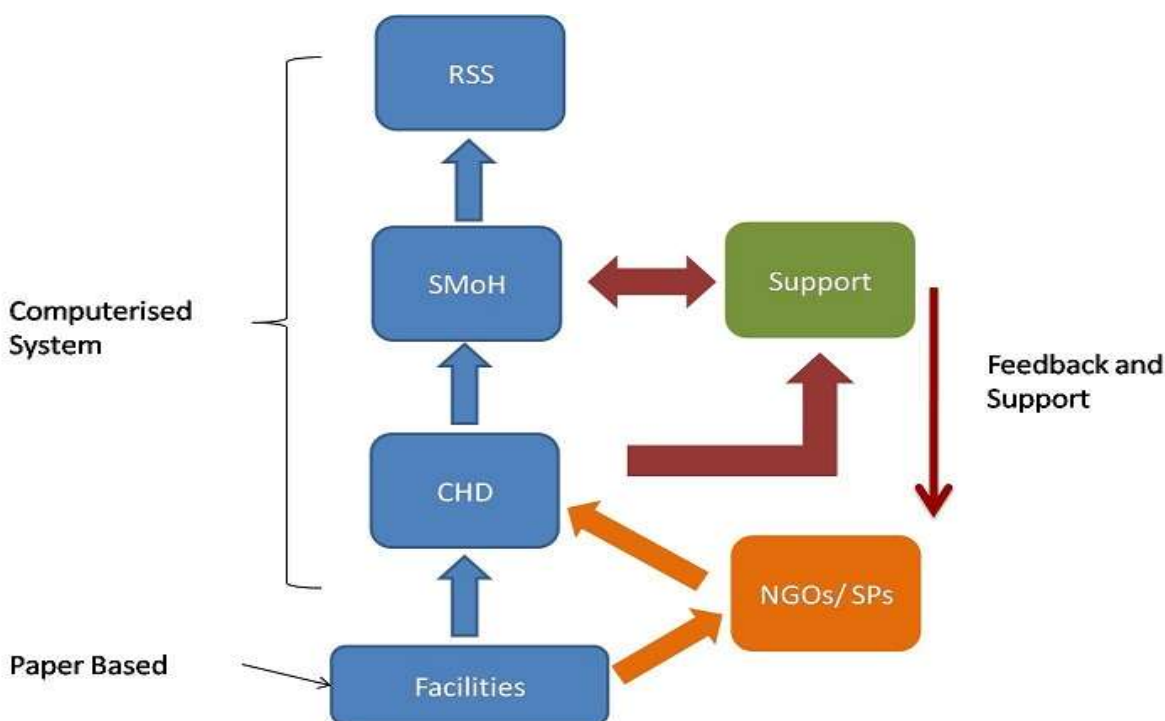
Figure1: Data flow of the routine HMIS

Data flow remains a challenge since most times counties and states were bypassed despite the above established routine HMIS (RSS MOH, 2011)

In March 2010 a rapid assessment took place in South Sudan to assess the status of the routine HMIS – the conclusions were sobering: there was not a system in place – data collection was piecemeal and in various formats; the list of indicators for collection was not defined or not relevant; reports (when available) were often incomplete and, when completed, were not understood by the health staff. (Carmen et.al, 2010) And other problems of Health Information System (HIS) like coverage, desegregation and consistency. (Ledikwe et.al 2014)

This study explores the knowledge, attitude and practice of health care providers on HMIS in Mundri West County and presents a detailed account on how they could be best bridged in the ongoing changes in country's health sector.

CHAPTER 3: METHODOLOGY

3.1 Study design

A cross-sectional descriptive study was conducted in February and March, 2015 in Mundri West County, South Sudan.

3.2 Study population

The study team interviewed all the qualified health care providers in public health facilities in mundri West County including the in-charge of the health facility available on the days of study visit plus the county data clerk officer.

3.3 Study Area

Mundri west is one of the counties in Western Equatoria State, Republic of South Sudan covering an area of 5837.6 sqkm. It's located approximately 115 miles west of Juba, the capital city of Republic of South Sudan; it is divided into two parts by Yei River. It is bordered by Mvolo County to the North, Maridi to the West, Mundri East to the East, Yei and Lainya Counties to the South.

The county is divided into four payams – Bangolo, Mundri, Kotobi and Amadi.

The county has 3 PHCCs (Primary Health Care Centers) that acts as first referral units for 16 PHCUs (primary health care units).

3.4 Data collection methods

Questionnaire; it was used in the study to interview qualified health care providers in mundri West County to assess their level of knowledge, attitudes and practices concerning HMIS and factors for change.

Record review guide; after the interview the research team also requested to see the HMIS booklets in order to review the completeness of records. The parameters mostly not recorded were documented. For recurrent incomplete records, the research team inquired about reasons for the incompleteness. County data clerk officer was also interviewed by the research team for the challenges affecting health information system in Mundri West County.

3.5 Data handling

The questionnaire and record review guide were pre-tested and corrected for some mistakes before the actual facility interview was carried out. Data was reviewed daily after collection.

Data processing was done through manual compilation using master sheets and simple excel master sheets. Data collected from the questionnaire and record review guide was presented using tables or graphically using pie chart, bar chart etc.

3.6 Pretesting

The study instruments (questionnaire and record review guide) were pre-tested in Lui hospital (mundri east county) on a small sample of health care providers outside the study population. This was to further train the interviewers and also to ensure the interview guide met the stated objective. After the pre-testing, problems such as ambiguity associated with the interview guide were modified.

3.7 Ethical consideration

Prior to commencement, Ethical clearance for this study was obtained from County Health Director, Hospital administrators in Mundri West County. In addition, informed consent was obtained from the qualified health care providers in the public health facilities who agreed to be part of the study. Privacy and confidentiality was ensured. The respondent's particulars were not written on the interview guide.

3.8 Study limitation

Not all study population (78) was interviewed because 4 staffs were on leave and one staff was sick during the study period hence a total of 73 respondents were interviewed.

To ensure majority of respondents are interviewed, the researchers didn't do data collection for 1 day but continually for 3 weeks.

CHAPTER 4: RESULTS

4.1 Characteristics of respondents

A total of 73 qualified health care providers out of 78 from 19 health facilities were interviewed.

Table 1: **Characteristics of respondents:**

Professional cadres of respondents	Frequency (n=73)	Percentage (%)
Clinical Officers	7	9.6
Enrolled nurses	15	20.5
Registered midwifes	2	2.7
Enrolled midwifes	8	11.0
MCHW	15	20.5
CHW	15	20.5
Medical Attendants	10	13.7
Data clerk officer	1	1.4

4.2 Training and knowledge on HMIS

More than three quarters (82.2%) of respondents had never been trained on HMIS. Almost two thirds (64.4%) failed to define properly what HMIS is. Of the respondents, only 6.8% mentioned 8-9 booklets, 16.4% mentioned 6-7 booklets, 43.8% mentioned 1-5 booklets and more than one third (32.9%) failed to mention even one out of twelve HMIS booklets. While 52.1% did know who are supposed to use the information collected at the health facility, 42.5% didn't know the importance of HMIS. On the other hand, more than one third (38.4%) of all respondents did not know the HMIS information flow pattern.

Table 2: **Respondents training on HMIS:**

Variable	Frequency (n=73)	Percentage (%)
Training of respondents on HMIS		
Trained on HMIS	13	17.8
Never trained on HMIS	60	82.2

Table 3: **Knowledge of respondents on HMIS**

Variable	Frequency (n=73)	Percentage (%)
Knowledge of respondents on HMIS		
Defined HMIS properly	26	35.6
Failed to define HMIS	47	64.4
Mentioned 8 – 9 HMIS booklets	5	6.8
Mentioned 6 – 7 HMIS booklets	12	16.4
Mentioned 1 – 5 HMIS booklets	32	43.8
Failed to mention any booklet	24	32.9
Knows the users of data collected from the health facility	38	52.1
Didn't know the users of data collected from health facility	35	47.9

Didn't know the importance of HMIS	31	42.5
Knows the importance of HMIS	42	57.5
Did not know the HMIS flow pattern	28	38.4
Knows the HMIS flow pattern	45	61.6

4.3 Attitude towards HMIS

Generally respondents had positive attitude towards HMIS. Since 91.8% agreed that the system (HMIS) was worthy for the time and other resources spent filling and processing data, and that it was important to continue with the system. However, 43.8% of the respondents pointed out that the current HMIS was difficult, complicated and that it needed to be simplified. Although they were generally positive they needed a better system.

Table 4: **Attitude of respondents on HMIS:**

Variable	Frequency (n=73)	Percentage (%)
Attitude of respondents on HMIS		
HMIS is worthy for the time, resources spent and it's important to continue with the system	67	91.8
HMIS is not worthy for the time and resources spent filling and processing data	6	8.2
HMIS is difficult, complicated and needs to be simplified	32	43.8
HMIS is not difficult, complicated and doesn't need to	41	56.2

be simplified		

4.4 Practices on HMIS

Of the respondents 46.6% had never used the HMIS data collected at the health facility level for planning, budgeting and evaluation of services provision. This was attributed by almost three quarters (74.0%) to poor knowledge on data analysis. The other major reasons for failure to utilize the local data were poor quality of data and poor managerial skills reported by 20.5% and 11.0% of the respondents respectively.

Figure 2: **A pie-chart showing respondents utilization of HMIS data for planning, budgeting and evaluation of service provision:**
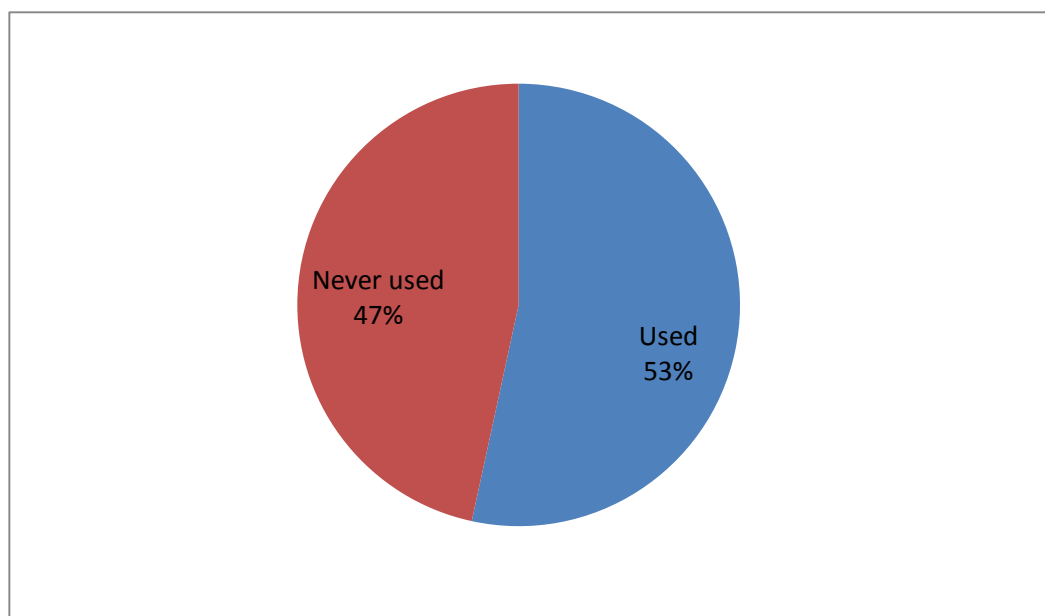
Figure 3: **A clustered cylinder showing respondents reasons for failure to utilize the local data generated from the health facility:**
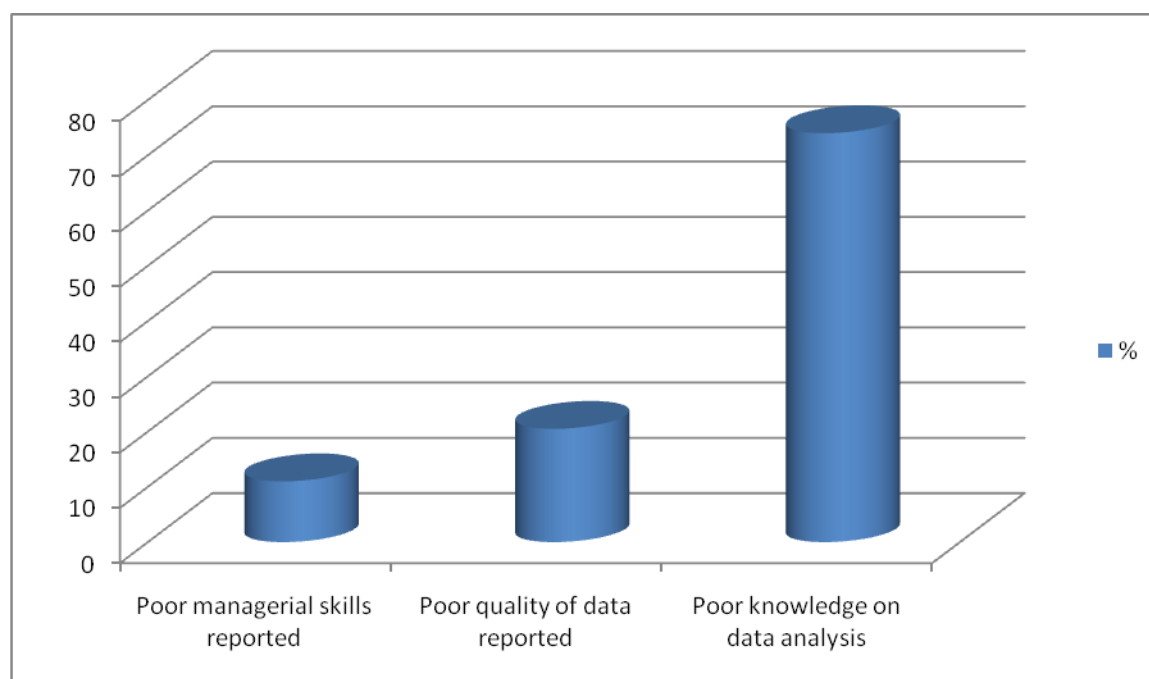
4.5 Completeness of HMIS booklets

The HMIS booklets in the health facilities were 100% according to Basic Package for Health Services (BPHS) for south Sudan, and of all reviewed HMIS booklets only a single delivery register from only one health facility was judged to be 100% complete. These booklets, however, were not filled in as many as 57.5% of the health facilities. The types of information that was found not recorded in the booklets for postnatal services (child vaccination/weight) were measles vaccine, DPT 3, polio vaccine and Vitamin A. These services were not recorded in these booklets despite the fact that it was assumed that these important health interventions had been given to the clients.

The type of information which was mostly not filled in the delivery booklets was the condition of the mother at discharge. The parameters which were commonly missing in the antenatal services' booklets were pregnant mothers' risk factors, VDRL test, TT vaccination and height. Reasons for

such incompleteness found were lack of VDRL reagent, workload pressure, forgetfulness and poor knowledge on data recording.

For OPD under 5 years daily patients register, the type of information which was mostly not filled was Height, Micro-nutrients (Vitamin A or Ferrous Sulphate), Heart rate, Measles, Meningitis, Respiratory rate, MUAC and the number of ORS given, Reasons for such incompleteness found were majorly due to workload pressure, inadequate staffs, forgetfulness, inadequate supervision and poor knowledge on data recording.

Figure 4:

A column 3-D cone showing health facilities in mundri west county filling delivery register
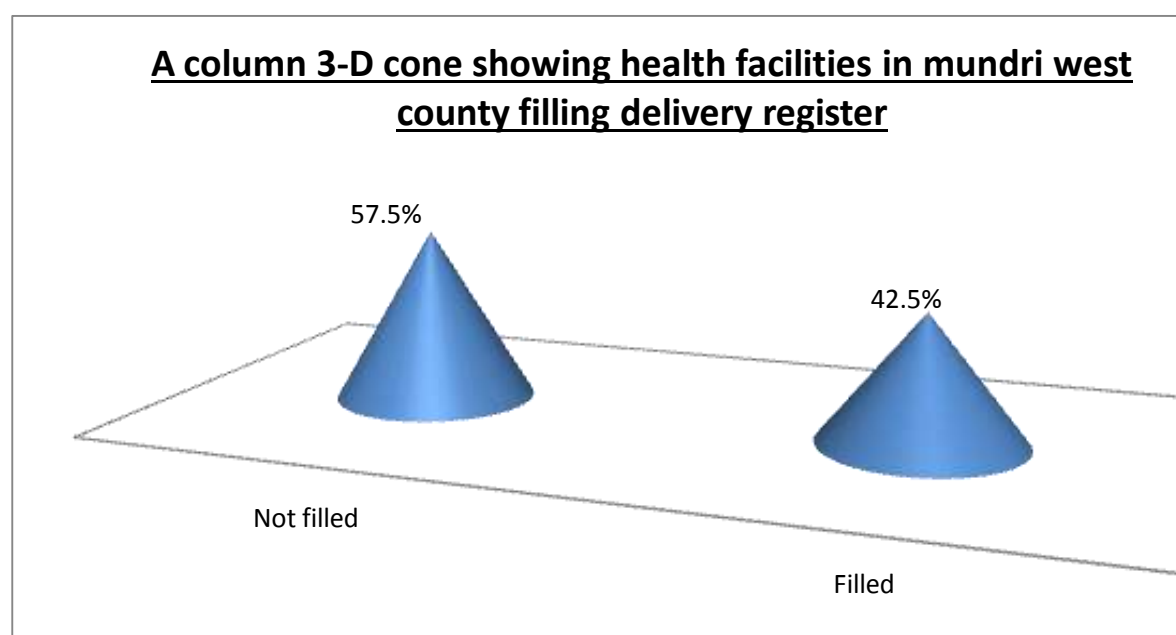
Table 5: **Parameters mostly not recorded:**

Booklets	Parameters
Postnatal care registers	(Child vaccination/weight) measles, DPT3, polio vaccine and vitamin A
Delivery	Condition of mothers at discharge

ANC	Pregnant mothers risk factors, VDRL test, TT vaccination and Height
OPD under 5 years daily patients register	Height, micronutrients(Vitamin A or ferrous sulphate), Heart rate, Measles, Meningitis, Respiratory rate, MUAC and number of ORS given

Table 6**: <u>Reasons for incompleteness of records by respondents;</u>**

Variable	Frequency (n=73)	Percentage (%)
<u>Reasons for incompleteness of records;</u>		
Workload pressure	67	91.8
Inadequate staffs at the health facility	41	56.2
Inadequate Supervision	39	53.4
Poor knowledge on data recording	47	64.4
Complexity of HMIS tools	32	43.8
Forgetfulness	22	30.1
Lack of VDRL reagents	25	34.2

CHAPTER 5:

This chapter presents the discussion of Findings, Conclusions and Recommendations.

5.1 DISCUSSION OF FINDINGS

The findings of this study uncovered a wide range of interlinked factors accountable for the inefficiency and ineffectiveness of the HMIS in Mundri West County. The lack of clear understanding of the purpose, users and flow pattern of health data collection was linked to poor quality of data collection and suggests that decision-making in the county health system may be less than satisfactorily informed. This study has revealed higher proportion (64.4%) of health care providers who failed to define properly what HMIS is than that (52%) reported in previous rapid assessment done by Laku et.al. 2010 in South Sudan. These results suggest a declining knowledge on this important system. On the contrary, even with such low knowledge on HMIS, the majority of the health care providers (91.8%) had positive attitude towards the system, indicating sizeable acceptability, a positive possible factor for improvement. The existing massive gap of knowledge on such significant system can be linked to lack of training which was as high as 82.2% of health care providers. On the other hand the findings suggest lack of emphasis on HMIS in the pre-service curricula and therefore a lack of evidence-based training in medical and paramedical training institutions in the country. Bearing in mind the ongoing process to develop and introduce competence-based educational curricula for all medical and paramedical training programs in the country and the government 10 year program to expand training of health care providers, inclusion of HMIS in the new curricula is very much suggested. The government of South Sudan (GOSS) MOH through its 10 year Strategic Plan for Human Resources (2007-2017), intends to train 5700 health care providers by the year 2017 and improve the provision of health services to the level of every boma and ward (GOSS MOH, 2007). The GOSS MOH believes that incorporation of HMIS in the new curricula will improve not only knowledge, skills, culture and efficiency of HMIS but will also reduce the investment required for on-the-job training for health care providers. However 2500 health care providers were realized in 2010 from the earlier 2023 in 2009 (GOSS MOH)

The failure to collect health data as seen in 57.5% of the health facilities for HMIS delivery booklets indicates the high degree of poor documentation, underreporting and data inaccuracy

from the county up to the national level. The HMIS guidelines necessitate health care providers to complete relevant booklets right away after provision of health care services before the patients or clients leave the facility. The impact of such poor conformity with this system is worrisome and suggests that vital public health decisions are made based on crude area and national estimates of burden of the problems. The failure to use health data collected at the health facility level as reported by 46.6% of care providers indicates that the main purpose of data collection is to report to higher levels signifying a high occurrence of the "mailbox syndrome". The "mailbox syndrome" is an observable fact whereby vital information generated at the health facility level is mailed rather than used locally for quality care improvement (Bergstrom, 2003). This syndrome is dissimilar to the concept of decentralization which is presently implemented in the country. These findings suggest also that the existing HMIS has not been institutionalized in the sense of being incorporated into the everyday activities, an essential factor for its sustainability and dependability.

Similar to many other reports the incompleteness and poor use of health data collected at a health facility, established in this study, can be accredited to poor knowledge on HMIS; inadequate financial, human and technological resource capacity; lack of user-friendly systems; lack of coordination and evaluation, as well as inadequate policies to manage the sustainability of the system (kimaro, 2005). Considering the lengthy and laborious HMIS routine requirements for completion of the booklets and the situation of acute shortage of care providers, adjustment for a more user-friendly system is highly recommended.

The fact that these factors have been documented and remained unattended in South Sudan over many years indicates a high degree of irresponsiveness and unaccountability in the country health system (Carmen, 2010). These findings suggest in part poor leadership performance. Carrying out "business as usual", a static mindset among the key actors and poor supervision of health systems are progress blocking agents which have been reported as the leading factors for poor performance of health sectors in sub-Saharan Africa (Charlesworth, 2003). These findings call for more commitment, dedication and accountability within an HMIS organization (Cibulskis, 2002).

5.2 CONCLUSIONS

This study has revealed a state of poor health data collection, lack of data-based decision-making at all levels and the factors for change in the country's HMIS. It calls for new innovations including incorporation of HMIS in the ongoing reviews of the educational curriculum for all cadres of health care providers and development of more user-friendly system.

5.3 RECOMMENDATIONS FOR HMIS IMPROVEMENT

Almost all respondents (97.3%) recommended training of health care providers in order to improve HMIS.

More than half (52.1%) of respondents recommended for improved supervision and increased staffing levels at the facility level.

Only 21.9% recommended for revision and simplification of the HMIS to be more user-friendly.

The respondent from the CHD reported that the process of health data in the current HMIS was long and difficult, with many booklets and forms with some repeating information. Poor knowledge on HMIS among health workers was linked to lack of training on the system and workload pressure. In view of these gaps the system is recommended for revision.

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ANNEX

1. **Data collection tools**

Questionnaire / Record review guide

Knowledge, attitude and practice of health care providers towards health management information system (HMIS) in mundri west county, South Sudan.

Introduction

This study is being conducted to assess the implementation of HMIS in Mundri West County, and it specifically seeks to understand the factors that may affect its effective implementation at the health facility level. In this interview I am specifically interested in getting your inputs and experiences, the problems you face or you are aware of, success stories and recommendations you have. I will then compile a report that will contain all staff comments without any reference to individuals. Your comments will remain confidential and will not be accessed by any other person except the researcher.

If you agree, I will then proceed with the interview.

Instruction to interviewer

DO NOT READ the coding options for the interviewee. Probe for responses as many as possible.

SN		CODING CATEGORIES	CODE
Part I: Health Facility Information			
1.1	Name of Facility	_____	
1.2	Category of facility	1. Hospital 2. Primary Health Care Centre 3. Primary Health Care Unit	/___/

		4. Clinics	
1.3	Facility ownership	1. Government	
		2. Religious	/___/
		3. Private	

Part II: Interviewee's Background Information			
2.1	Responsibility at the facility level	1. Facility in charge	
		2. Head of unit	/___/
		3. Health care provider	
2.2	Designation	1. Medical Attendant 2. Community Health Worker 3. Maternal Child Health Worker 4. Enrolled Nurse 5. Enrolled Midwife 6. Registered Nurse 7. Registered Midwife 8. Medical Officer/Assistant 9. Hospital/PHCC Administrator	/___/
2.3	Working experience	1.Less than five years	
		2.Five years and above	/___/
2.4	Ever exposed to any formal training on HMIS?	1.Yes	
		2.NO (if NO go to part iii)	/___/
2.5	If Yes in Question 2.4, when did you have your last training done?	1.Less than 5 years	
		2.Five or more years ago	/___/

Part III: Knowledge on HMIS			
3.1	How would you define the term Health Management Information System (HMIS)?	_____ _____ _____ _____ _	
3.2	Can you mention the booklets which are used in HMIS?	1.Yes 2.No	/___/
3.3	If the answer is "YES" in question number 3.2 above mention them [Use the checklist of the booklets]	1. Mentioned all 2. Mentioned 7-9 3. Mentioned 5-6 4. Mentioned 1–5 5. Failed to mention even one	/___/
3.4	What is the importance of HMIS?	1. _____ 2. _____ 3. _____	
3.5	Where is the HMIS information (data) supposed to be sent? Judge whether he/she outlined the information flow pattern correctly, partially, completely incorrectly	1. Correct 2. Partially correct 3. completely incorrect	/___/
3.6	Who is supposed to utilize the information which you always collect and record in the HMIS registers / booklets?	1.Health manager at facility level 2.Facilities health committee 3.Health Managers at county/state	Circle all responses

		level	
		4.Health managers at national level	
		5.Others (specify)	
		_____	
3.7	How frequently is HMIS information / report supposed to be sent to higher levels?	1. Once yearly 2. Twice yearly 3. Quarterly 4. Monthly 5. Other frequencies: specify _____	/___/

Part IV: Attitude of the interviewee towards HMIS

4.1	Considering that health care providers have different feelings about HMIS, do you really feel that HMIS is worthy for the time and other resources spent filling and processing data for?	1.Agree 2.Disagree	/___/
4.2	If Agree / Disagree in question 4.1 above give reasons	1. _____ 2. _____ 3. _____	
	A lot has been said about HMIS by the health care providers, please indicate whether you agree or disagree with the following statements (Read out the statements)		

4.3	It is important to continue with HMIS and associated activities for health care improvement at the health facility level	1.Yes 2. No 3. I Don't know	/___/
4.4	HMIS is meant for health managers at the county, state and national levels and not the health facility.	1.Yes 2. No 3. I Don't know	/___/
4.5	The current HMIS is difficult, complicated and need to be simplified.	1.Yes 2. No 3. I Don't know	/___/

Part V: Practice on HMIS

5.1	Do you collect and record data in the HMIS booklets when attending patients / clients?	1. Yes 2. No	/___/
5.2	Who are the consumers of the data which are always collected and recorded in the HMIS booklets in this facility?	1. Health manager at facility level 2. Facilities health committee 3. Health Managers at county/state level 4. Health managers at national level 5. Others	Circle all responses

		(specify)_____	
5.3	For what purposes do these consumers utilize the data?	1. Policy-making 2. Planning and budgeting 3. Evaluation of health programs 4. Others (specify _____ _	/___/
5.4	From your experience how do you utilize these data in this facility? (Probe the interviewee to give few examples on how they utilized the HMIS data for health care improvement)	1. _____ _____ 2. _____ _____ 3. _____ _____	
5.5	What are the factors, if any that hinder you not to effectively utilize the information recorded in the HMIS register?	1. The current structure of the health system does not encourage local utilization of the data 2. Poor knowledge on the data analysis 3. Poor managerial skills 4. Poor quality of data 5. Other reasons (specify) _____ _____	Circle all responses

5.6	In your opinion (if any) what should be done in order to improve the HMIS?	1. _____ 2. _____ 3. _____ 4. _____

RECORD REVIEW GUIDE

1. Available HMIS booklets used in the health facility according to Basic Package for Health Services (BPHS) for South Sudan

(a) Yes [ ]

(b) No [ ]

2. Completeness of HMIS booklets

(a) Not filled [ ]

(b) Partially filled [ ]

(c) Fully filled [ ]

3. Parameters mostly not documented?

………

………

4. Reasons for the incompleteness of records?

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THANK YOU FOR PARTICIPATING

2. Sketch Map showing health facilities in Mundri West County

SKETCH MAP SHOWING HEALTH FACILITIES IN MUNDRI WEST COUNTY