International Journal of Public Health and Pharmacology
Volume 3, Issue 1, 2023 (pp. 71-91)
www.abjournals.org

Determining the Level of Health Management Information System Data Use in Southern Region of Lesotho

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Cite this article:

Taunyane E.M., Mpati E.F. (2023), Determining the Level of Health Management Information System Data Use in Southern Region of Lesotho. International Journal of Public Health and Pharmacology 3(1), 71-91. DOI: 10.52589/IJPHP-RVH2FVEP

Manuscript History

Received: 3 Feb 2023

Accepted: 21 March 2023

Published: 24 May 2023

ABSTRACT: *Health management information system (HMIS) has been implemented in many countries to promote evidence-based decision making. The aim of this study was to generate information that will help the Ministry of Health (MOH) to improve the use of HMIS data at district level in southern region, Lesotho. This was a descriptive cross-sectional study which employed explanatory mixed methods approach. Quantitative data were collected through records reviews while qualitative data were collected through interviews and records reviews. The findings have shown that DHMTs and district hospitals are using HMIS data quite satisfactorily. Also, data demand by managers and possession of HMIS skills influences the use of data. In conclusion, the main enablers to a satisfactory level of HMIS data use in the southern region were ability of managers to demand data from their subordinates and improved data quality because of intensive interventions aimed at strengthening Lesotho's HMIS by external donors.*

KEYWORDS: HMIS

Article DOI: 10.52589/IJPHP-RVH2FVEP
DOI URL: https://doi.org/10.52589/IJPHP-RVH2FVEP

INTRODUCTION

According to Moukénet (2020), the World Health Organisation (WHO) emphasises the importance of quality of data across nine dimensions: accuracy, validity, reliability, completeness, legibility, timeliness, accessibility, usefulness and confidentiality [3]. However, Health Management Information Systems (HMIS) in many resource-limited settings, do not currently meet these standards [4, 5]

Health Management Information System (HMIS) is a set of data regularly collected at health care facilities to meet the needs of statistics on health services (Mboera et al., 2021). In many low- and middle-income countries, the Health Management Information Systems (HMIS) have been established to enhance routine health facility-based data management. The effectiveness of a health information system depends on collecting, analysing, interpreting, and utilising the information correctly at all levels (Mboera et al., 202. The main users of HMIS are managers and care providers at district level and below. Executive managers, public policymakers and researchers can also use HMIS data for governance and research.

There has been a global consensus that health data should not only be used at the central level, but also at the point where it is generated to guide decision making at the local level (WHO, 2003). For instance, at facility level, health information is needed for effective clinical management and for evaluating the extent to which services are meeting the needs and demands of communities. Managers and planners at district levels need health information for supervising and monitoring performance of health facilities and of the health systems as a whole within their catchment areas. Managers at national level, nonetheless, need health information for making national health policies and strategic planning. Too often, however, lower level managers are required to report massive quantities of data to higher levels, but rarely receive feedback (Nutley & Reynolds, 2013).

In Lesotho, the HMIS is overseen by statistics unit within the department of planning at the Ministry of health (MOH). This unit has been assigned the duty of routinely collecting quality health data for the ministry on service delivery and utilization, and timely give out health statistics reports. HMIS has been found to be lacking sufficient funds (MOH, 2013a). Nevertheless, it has received more external funding over last decade (MOH, 2013a). World Bank and United States of America through President's Emergency Plan for AIDS Relief (PEPFAR) and Millennium Challenge Compact (MCC) have supported HMIS strengthening in a number of ways. Institute of Health Measurement (IHM), which is the main PEPFAR partner, has been providing technical assistance for strengthening the health information system. The World Bank, on the other hand, provided electronic devices for improving the system and recruited District Health Information Officers (DHIOs) to District Health Management Teams (DHMTs) (Mwase et al., 2010). The DHIS 2 was officially launched in 2015. This system is a national data link that has been built to connect all districts to the government data network.

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LITERATURE/THEORETICAL UNDERPINNING

The use of HMIS data

Nutley and Reynolds (2013) define the HMIS data use as the transformation of raw health data into comprehensible health information, and interpretation of what it means in order to make informed decisions. Wickremasinghe et al. (2016) explored ways in which health managers in low and middle income countries are using HMIS information to make decisions. They found that district administrators and health managers are using HMIS information to prioritise health problems that need timely intervention, draw up budgets, allocate resources equitably, make annual health plans and program specific decisions. They also use it to track progress of health plans implementation and achievements of the targets. Nonetheless, countries differ in how they use HMIS information. In Botswana, for example, the use of HMIS information for planning and decision-making for general health services was found to be limited; it was mostly used for monitoring performance in vertical disease programs (Seitio-Kgokgwe et al., 2015). In some countries, local health data is mainly collected for reporting to higher administrative levels where it is combined with data from other service areas, analysed and used to make annual plans and decisions. Feedback about decisions made is sent back to the lower administrative level; mostly being district and health facilities. It is therefore important to take into account the context of each HMIS when assessing how information is being used by health managers. Nutley and Reynolds (2013) add that HMIS information is also used as a tool for advocacy and health policy making.

In their case study to examine the potential of public and private sector health data for district decision making in developing countries, Bhattacharyya et al. (2016) found that health data collected and maintained at district level has potential to aid planning and decision making across all WHO's health systems building blocks. For instance, they noticed that HMIS data can even show the number of supervisory visits from district health management teams to health facilities and thus open opportunities for improving governance in health systems. Harries et al. (2013) and Aqil et al. (2009) also concluded that HMIS data can also serve as a basis for research upon which strategies of improving quality, efficiency, effectiveness and outcomes of health systems in general lie. Since it provides time series data, it can also allow researchers to use quasi-experimental study designs to evaluate effectiveness of health system strengthening interventions by comparing health units that received intervention with those that did not (Iyer et al., 2017).

Some data elements matter most to health managers and the public, and therefore require strict monitoring. These include information about burdensome diseases in the district or coverage of essential services in the catchment area. Analysed data about such indicators need to be displayed either on electronic dashboards and/or display boards in a compelling way for both policy makers and the general public (HMN, 2008). At health facilities, this practice enables quick detection and mapping of disease outbreaks within catchment areas and thereby assisting integrated disease surveillance and response (IDSR) systems. Data display enables managers to track progress of diseases or health programs at a glance. For example, the use of performance dashboards enabled continuous modification of plans during an implementation of a project that aimed at improving the performance of HMIS in Mozambique (Sherr et al., 2013). It was therefore easy to monitor the project and respond quickly to deviations from what was supposed to be done. Aqil et al. (2009) tell that, "…how well data are displayed reflects whether the data have been transformed into information" (p. 221). Information that is

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displayed should be presented in a comprehensible but easily understandable way to potential viewers.

When HMIS data is being used for making plans or reviewing performance; health facility managers, district health administrators and all relevant stakeholders normally come together and proactively review health data to inform any decision to be made. Forums such as meetings and workshops are usually used to discuss about the data and enable stakeholders to reach consensus about which problems need to be addressed, what strategies can be used, what issues need to be given first priority and what decisions are supposed to be made (Wickramasinghe et al., 2016). Consensus reached by the stakeholders is important to ensure that whatever plans are made will have support and be implemented accordingly (Nnaji et al., 2010). To assess whether meetings are being held to discuss HMIS data, it is therefore advisable to observe the minutes of the meeting to confirm that data was indeed discussed and has helped managers to make plans and decisions (Nutley et al., 2014).

Upper administrative levels in the health systems are expected to give feedback to the lower health units after analysis to enable continuous improvement of performance. Studies show that feedback can be given in report form, review meetings or verbally during supervisory visits (Ledikwe et al., 2014; Innocent et al., 2016). Hence, some organisations have developed feedback report templates to be used so that feedback is sent in prescribed format (Nutley, 2012). Some studies, however, show that in developing countries, district health managers and health facility administrators seldom receive feedback about their performance, even when they do it is not timely (Aiga et al., 2008). District health managers in Botswana remarked that they received feedback only when they went for mid-term reviews at MOH's headquarters (Seitio-Kgokgwe, 2015). This denied them opportunities to use HMIS data to make sound improvement plans and policies as feedback was given after a long period of time, and yet they did not analyse data for themselves. Consistent and timely feedback is believed to have improved quality and use of HMIS data in prevention of mother to child transmission (PMTCT) program in South Africa because health facility managers were able to act on the feedback and thus used HMIS information for performance improvement (Mphatswe et al., 2012). What studies have not shown, though, is whether HMIS information can instigate district health managers to take supervisory visits to health facilities to fill observable gaps.

Some studies have found that the level of HMIS data use is very low at lower and middle administrative levels in low and middle-income countries (Avan et al., 2016; Kiberu et al, 2014). Low level of HMIS data use implies wastage of resources that have been used to generate it and thus shows that health systems in those countries are ineffective and inefficient. It is therefore important to study why HMIS information is not being used. Meanwhile, several challenges to the desired use of HMIS data in these countries have been identified. For instance, the degree of decentralisation has been found to have an impact on the ability of district health managers to make decisions using collected HMIS data. In countries whose health systems are more centralised, district health managers do not have autonomy over the use of resources. They cannot make some decisions on their own, hence will have to refer some issues to the higher level for action. Sometimes they are not able to make decisions even when they have evidence for decisions that they could make. This is exemplified by the situation in Ethiopia, whereby district health administrators and managers are strictly guided by national targets, not local context, when making decisions and plans (Avan et al., 2016). Centralised health systems sometimes require data to be collected from health facilities though district level up to the

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national level whereby data will be compiled and analysed. The challenge comes when these central administrative levels take too long to send feedback to the lower levels, and thus rendering feedback useless (Aiga et al., 2008). On the other hand, the feedback has been criticised for having lost its relevance as details needed for local use have been lost during analysis and aggregation with data from other service areas. Contrary to the situation in Ethiopia, in India, the planning process starts at block or council level up to the district level (Avan et al., 2016). Even though planning and decisions are made within budgetary constraints from the central level, health managers have autonomy over how allocated funds can be used. While one would expect Indian district managers to use routine health data in district's annual planning, that is not the case. Annual district health plan based on figures projected from previous year's plan, and this shows that there are other barriers constraining the use of HMIS data despite decentralised autonomy managers have to make decisions.

Other reasons for limited HMIS data use in low and middle income countries include inappropriate indicators for local use (Seitio-Kgokgwe et al., 2015). As mentioned above, this often occurs when data is collected for reporting only, and collected data is normally not applicable to solve local problems. This was observed by Kiberu et al. (2014) in their study from Uganda, immediately after the implementation of DHIS 2. They realised that district health managers were too focused on collecting and reporting data to the ministry of health without using it to address local health problems. The question that has not been answered is what prevents health managers from demanding data that is relevant to them. In Xieng Khouang and Houaphanh provinces, Lao People's Democratic Republic, health facilities are even keeping data for a long period of time and destroy it once a report has been sent to upper administrative levels (Sychareun et al., 2014).

METHODOLOGY

Introduction

This chapter discusses the methodology that was used for this study. It describes the study area, study design, study population, study units and sample size and sampling techniques. It further gives details about study variables, data collection methods and instruments, analysis and presentation, quality control measures, ethical considerations and limitations to the study. Lastly, it explains how the findings of the study will be disseminated.

Study Area

The study was conducted in the Southern region, Lesotho. This region is made up of four districts namely: Mafeteng, Mohale's Hoek, Quthing and Qacha's Nek. This region has been chosen because it was the worst performing region in terms of HMIS utilisation as none of its districts conducted even a single quarterly performance review since 2012/13 financial year (MOH, 2016).

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Study Design

The study used a cross-sectional descriptive design. Both quantitative and qualitative methods of data collection, namely, interviews and records reviews, were used. Quantitative data were collected first, and analysed to show the current level of HMIS data utilisation. Based on the observed level of HMIS data utilisation, the researcher revised appropriate questions to be asked in order to determine the factors affecting utilisation of HMIS data in the southern region, Lesotho. Hence, qualitative data were collected after the analysis of quantitative data. This design was the most appropriate because the researcher aimed to get the snapshot of current level of HMIS data use at DHMTs and district hospitals and understand perspectives of HMIS use stakeholders on factors that are affecting the observed level of HMIS data use. Quantitative data were used to determine the level of HMIS data use while qualitative data were used to assess factors that affect the utilisation of HMIS data in the southern region.

Study Population

The study population for this study was DHMTs, and since district hospitals managers are part of DHMTs, hospitals were also included by default. Each district in the southern region has one DHMT and one hospital.

Study Units

The study units for this study were DHMT and hospital managers who are expected to use HMIS data for evidence based decision making.

Sample Size and Sampling Techniques

Since the southern region has only four districts, all DHMTs and district hospitals in this region were included in the study. However, ten respondents who have a stake in the use of HMIS data from each DHMT were purposefully sampled. These included DHIO, as the HMIS focal person at district level who performs HMIS tasks and transmits HMIS reports to central level, and district health manager, who oversees the district health management team and is responsible for making decisions concerning health services provided in the district. The district pharmacist was included, as the person who is supposed to use HMIS data in the mobilisation of drugs. Similarly, the head of laboratory services was included because he/she is expected to use HMIS data to mobilise laboratory supplies. The manager of nursing services who oversees services related to child, maternal and inpatient health services was also included in the study. Heads of health facilities at district level, that is, the medical superintendent and the public health nurse, were included in the study as well because they are expected to plan and monitor the performance of interventions in the facilities. The other person who was included was a health inspector, whose work involves monitoring, detection and control of infectious disease. This role is expected to rely much on HMIS data. Two more last people to be included were HIV/AIDS coordinator and TB officer as personnel responsible for monitoring and implementing TB and HIV/AIDS programs at district level. For hospitals, unit heads for the following units: nursing, pharmacy and laboratories were included in the study. Hospital data clerks were also included for their vast knowledge in the generation and flow of HMIS in their organisation. However, only 37 respondents were interviewed because the data had reached saturation.

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Study Variables

The study measured the following variables in line with the study objectives. HMIS data use was the dependent variable while technical, behavioural and organisational factors were independent variables.

Variable one: The level of HMIS data use at DHMTs and district hospitals

The level of HMIS data use was measured in relation to the availability of evidence showing that performance indicators have been set to monitor facility's performance with regards to key aspects of the health system namely, child health services, reproductive health, service utilisation, resource utilisation and disease prevention and control. Evidence showing that targets to be achieved for key performance indicators have been set in the previous financial year based on the baselines was also observed. Monitoring of the facility's KPIs through time trend displays and maps was also assessed. The health facility was expected to prove that it keeps track of its performance by analysing and displaying monthly, quarterly and yearly key indicators information and generating performance reports. .

The researcher also sought to see evidence showing that HMIS data is being used to evaluate a facility's performance. This was expected to be in the form of comments or comparison between results obtained by the facility based on the baseline and the target, or comparison among health facilities, or comparison with national score. Other evidence was the facility's appraisal of performance based on the HMIS results.

Lastly, the level of HMIS data use was measured in relation to availability of evidence showing that data is being used to make decisions at the facility. The researcher sought to observe reports showing that HMIS data was used to conduct a situational analysis to assess existing situation of various services provision at the health facility/district and whether HMIS data was used to prioritise allocation of resources to certain departments or services based on need. Evidence was also sought to see if HMIS data is used to monitor staff workload and performance, and to influence policy development. Below is the table summarising how this variable was assessed.

Table 1: Level of HMIS use at the district and health facilities

Indicator	Explanation of indicator	Definition of score
Setting performance indicators	Is there evidence of key indicators set by the health facility or DMHT to monitor/track the district/health facility's performance of the following health system's aspects i. Child health services Immunisation coverage either using DPT3 and Measles ii. Reproductive Health using any of the following indicators a) Contraceptive acceptance rate b) Antenatal care coverage c) Proportion of deliveries attended by skilled health personnel	**Good level of HMIS use per the indicator:** Presence of an indicator for tracking all five of (child health services, reproductive health, disease prevention and control, resources use and services utilisation) key aspects **Promising /moderate level of use per the indicator:** Only four of (child health services, reproductive health, disease prevention and control, resources use and services utilisation) key aspects are tracked with indicators

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Indicator	Explanation of indicator	Definition of score
	iii. Disease Prevention and Control a) New HIV/ AIDS cases per 1000 population b) HIV/ AIDS fatality rate c) New pneumonia cases amongst under 5s per 1000 population under 5 years d) TB case detection rate e) TB cure rate, f) Number of clients receiving VCT services g) Number of PLWHA currently on ART iv. Resources Use a) measured using Tracer drug availability (in stock) v. Services utilisation a) OPD attendance per capita b) In-patient admission rate c) Average length of stay d) Bed occupancy rate	**Low level of HMIS use per the indicator**: Only two-three of the key aspects(child health services, reproductive health, disease prevention and control, resources use and services utilisation) are monitored with any indicator **Very low level of HMIS use per the indicator**: Only one of the key services of (child health services, reproductive health, disease prevention and control, resources use and services utilisation) are monitored with any indicator **No use of HMIS per the indicator:** There are no HMIS indicators for measuring performance of any of the key services mentioned
Setting targets to achieve in a financial year based on the baselines	- Is there a specific, planned level of result to be achieved within a specified time frame (monthly, quarterly and yearly) based on the indicators above? - Are the targets based on the baselines?	**Good level of HMIS use the indicator:** 80-100% of the indicators have set result to be achieved with a baseline and goal to be attained in a specified timeline indicated **Promising /moderate level of use per the indicator:** 50-79% % of the indicators have set result to be achieved with a baseline and goal to be attained in a specified timeline indicated **Low level of use of HMIS use per the indicator:** 30-40 % of the indicators have set result to be achieved with a baseline and goal to be attained in a specified timeline indicated **Very low level of HMIS use per the indicator**: Less than 50% of the indicators have planned result to be achieved set with a baseline and goal to achieve for a specified timeline **No HMIS use:** No evidence of set targets

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Monitoring of performance through report generation and displaying performance of health facility/ DHMT	- Are there HMISs data displays? - Are the 2018 monthly, quarterly and yearly reports prepared and available for the users	**Good level of HMIS use per the indicator:** - Updated monthly, quarterly and yearly performance of all the key indicators set above is displayed using either time trend graphs or maps. - All monthly, quarterly and yearly reports for the 2018 financial year performance of key indicators are prepared and accessible to users
		Promising/moderate level of use per the indicator: - Updated monthly, quarterly and yearly performance of some key indicators set above is displayed using either time trend graphs or maps. - Only two of either monthly, one of 2018 quarterly and yearly reports were prepared and accessible to users
		Low level of HMIS use per the indicator: Performance displays available but not up-to-date. Only one- two of either 2018 monthly, quarterly or yearly reports were prepared and available for users
		Very low level of HMIS use per the indicator: No performance displays -Monthly, quarterly or yearly reports produced but not available for users
		No HMIS use the indicator Health facility is not keeping track of any of the indicators
Using HMIS to evaluate health services performance at the health	i. Is there a comment made by managers on the performance of the health facilities on each of the indicators for the financial	**Good level of HMIS use per the indicator:** If evidence exists for all 5 of the parameters measured
		Promising/ moderate level of use per the indicator:

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facility/DHMT	year 2018 data in comparison with baseline? ii. Is there comparison of performance with other health centres or health facilities in the district or region for the HMIS data of 2018? iii. Is there comment and comparison of 2018 HMIS results with expected/ target service coverage for the health facility or district? iv. Is there a comment on the results of 2018 in comparison with the national score for all key indicators? v. Is there an appraisal of performance of the health facility/district based on HMIS results of the first quarter 2019?	If evidence exists for 3-4 of the parameters measured **Low level of HMIS use per the indicator**: If evidence exists for 2 of the parameters measured **Very low level of HMIS use per the indicator**: If evidence exists for 1 of the parameters measured **No HMIS use per the indicator** There is none of the parameters for evaluation being used
Using HMIS for decision making at the health facility or DHMT	Is there evidence that HMIS data has been used in: i. Conducting situation analysis to assess the existing situation of various services provision at the health facility/district ii. Prioritising resources allocation to certain services based on most leading diseases or public health needs for the financial year? iii. Prioritising provision and allocation of health services in various areas/departments	**Good level of HMIS use per the indicator:** If evidence exists for 5-6 of the parameters measured **Promising/ moderate level of use per the indicator:** If evidence exists for 3-4 of the parameters measured **Low level of HMIS use per the indicator**: If evidence exists for 2 of the parameters measured **Very low level of HMIS use per the indicator** If evidence exists for 0-1 of the parameters measured

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	iv. Assessing the need, quality and monitor staff workload and performance v. Allocation of resources during strategic planning (3-5 year plans) vi. Development of policy at district or facility level	**No HMIS use per the indicator** No evidence of decision making is being influenced by HMIS as per the parameters of assessment

Green– good level of use of HMIS per the specific indicator **(A)**	**Yellow – Promising/moderate level of use of HMIS per the specific indicator** **(B)**	**Blue-** **Low level of HMIS use per the specific indicator** **(C)**	**Pink** **Very low level of HMIS use per the specific indicator** **(D)**	**Red-** **No use of HMIS data as per the specific** **(E)**

Overall level of HMIS use will be measured as (A=4, B=3, C=2, D=1 and E=0)

Table2: Grading of HMIS data use at a district or Hospital

Grade	**Score)**	**Description**
- Good	16-20	The level of use of HMIS by the health facility/district is outstanding
- Encouraging	11-15	The use of HMIS data is satisfactory
- Low	6-10	HMIS use in the health facility is marginal
- Very low	1-5	The use of HMIS in the health facility/district is occasional
- No use if it scores	0	The health facility/district doesn't use HMIS

Table3: Grading of HMIS data use by facilities per indicator

Grade	**Score)**	**Description**
- Good	13-16	The level of use of HMIS by the health facility/district is outstanding
- Encouraging	9-'12	The use of HMIS data is satisfactory
- Low	5-8	HMIS use in the health facility is marginal

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- Very low	1-4	The use of HMIS in the health facility/district is occasional
- No use if it scores	0	The health facility/district doesn't use HMIS

Table4: Grading of overall HMIS data use in the region

Grade	**Score)**	**Description**
- Good	60-80	The level of use of HMIS by the health facility/district is outstanding
- Encouraging	40-59	The use of HMIS data is satisfactory
- Low	20-39	HMIS use in the health facility is marginal
- Very low	1-20	The use of HMIS in the health facility/district is occasional
- No use if it scores	0	The health facility/district doesn't use HMIS

Variable two: Behavioural factors affecting the use of HMIS data in southern region

Behavioural factors were assessed qualitatively in relation to staff's motivation to carry out HMIS tasks and use data, ability to demand HMIS data and confidence in performing HMIS tasks through key informant and in-depth interviews. Questions were asked to ascertain whether DHMT members and hospital staff have enough motivation, and confidence to check quality of data, calculate indicators, plot, interpret and use data. Other questions to assess values and attitudes of individuals towards HMIS data analysis and use were also asked.

Questions were also asked to see whether DHMT members and hospital unit heads actively request for data that they need to make decisions and plans. Since this can be done through policy directives specifying what that data is supposed to be collected or requests for special analyses of data, the researcher first asked questions to find if data being generated meets DHMTs' and hospital unit head's information needs and probed to find out if specific data has been requested from health facilities and data clerks.

Variable three: Technical factors affecting the use of HMIS data in southern region

Technical factors were assessed in relation to the system's ability to combine data from other stand-alone information systems, and whether users find the system easy to use using key informants and in-depth interviews. HMIS design was also assessed on whether it captures all information that gives a comprehensive picture of health system performance and whether such information is easily accessible to all health managers at district level and unit heads at the hospital. The competence of staff to perform HMIS tasks was assessed.

The researcher assessed quality of data in terms of whether respondents have ever faced problems with using data because of its quality, and further investigated if respondents had confidence in the quality of data. To assess this, the researcher probed for information related to timeliness, completeness, accuracy and relevance of HMIS data available to its prospective users.

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The study further assessed whether HMIS processes such as information sharing, accuracy checking, analysis, adaptation to meet users' need and data discussion exist; through key informant and in-depth interviews, and review of documents. With regard to information sharing, the researcher asked questions to find out if information is being distributed to all people who need to use it and probed to see if DHMTs and hospital unit heads send feedback in time to health facilities or subordinates. Routine data quality assessment reports were observed to show if data is being checked for accuracy from both district and health facility level, as DHMTs are supposed to verify that health facilities are reporting accurately. Questions were also asked to find out if HMIS data is being analysed and presented in formats that are easily understood by the recipients.

Variable four: Organisational factors affecting the use of HMIS data in southern region

Organisational factors were assessed qualitatively in relation to the DHMT's autonomy to make decisions and plans for the districts; availability of HMIS resources including the staff; training of staff on HMIS processes and use; culture of information and HMIS governance. Data were collected through key informant interviews and observation of documents. HMIS governance was assessed in terms of presence and clarity of HMIS standard operating procedures and guidelines. Documentation which shows a distribution list of the past monthly/ quarterly HMIS reports at DHMT, including feedback to health facilities was reviewed to assess how data is being used for reporting. To assess whether the DHMT and district hospitals have been training their staff to improve their HMIS skills and use of HMIS information; the presence of HMIS training manual, training guideline for managers and a schedule for next training sessions were observed. The presence of HMIS related expense registers, HMIS monthly/ quarterly reports and long-term financial plan for supporting HMIS activities were observed to see whether attention is being paid to HMIS financial needs. This showed whether HMIS information is being valued or not at both DHMTs and hospitals. To assess whether there is promotion of culture of information, questions were asked to assess this construct along four dimensions, namely: use of information, emphasis on data quality, evidence based decision making and feedback. More questions were also asked to find if HMIS indicators have ever been reviewed in the last five years to ensure that all team members received all HMIS information that they need. The availability of resources needed for running HMIS such as equipment, utilities, registers and competent human resources was assessed using a checklist through observation. It was also investigated whether the DHMTs and hospitals have introduced performance-based financing and whether planning is bottom up or top-down.

The researcher also asked questions to investigate potential organisational strategies that can be implemented to improve the use of HMIS data utilisation.

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Table 5: The summary of study variables, their indicators, data collection methods and tools

Objective	Variable	Indicator	Data Collection Method	Data collection Tools
To determine the level of HMIS data use in the southern region	The level of HMIS data use	•Setting performance indicators • Setting targets to achieve in a financial year based on the baselines • Using HMIS for decision making at the health facility or DHMT • Monitoring of facility's performance •Using HMIS data use for evaluation of health services performance	Interview and observation	Checklist
To assess behavioural factors affecting the use of HMIS data	Behavioural factors affecting the use of HMIS data	Level of: •Motivation, •Confidence, •Data demand •Values towards HMIS data, •Attitudes	Interview	Interview guides
To assess technical factors affecting the use of HMIS data	Technical factors affecting the use of HMIS data	•User-friendliness of HMIS •Integration level of HMIS with other systems •Data accessibility •HMIS knowledge and skills •Perceived quality of data: ● Relevance ● Timeliness ● Completeness ● Accuracy •HMIS design •Data analysis •Data adaptation to meet user needs	Interview and observation	Interview guides and checklist

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To assess organisational factors affecting the use of HMIS data	Organisational factors affecting the use of HMIS data	•Decision making power •Clarity of HMIS guidelines and SOPs •HMIS financing •Training of staff •Availability of HMIS resources and staff •Culture of information	Interviews and observation	Interview guides and checklist

Data Collection and Study Instruments

Checklists were used first to observe availability of records showing evidence of HMIS data use and determine its level quantitatively. After the analysis of quantitative data, interview guides were then used to collect qualitative data from purposefully selected DHMT members, hospital unit heads and data clerks. All interview sessions were recorded while notes were being written down on a notepad simultaneously. A checklist was also employed to tease out evidence for some organisational and technical factors.

Data Analysis and Presentation Methods

The quantitative data were analysed first using Microsoft Excel version 2010 and presented into interpretable tables. The qualitative data, on the other hand, were analysed through constant comparison analysis. The researcher began by repetitively listening to recorded interview sessions and transcribed them into Microsoft word version 2010, aided by notes written down during the same sessions. The researcher then identified meaningful excerpts from the data and assigned codes to them in Microsoft Excel version 2010. Consequent excerpts were then compared with the already coded ones so that those similar could be assigned the same codes. After coding the data, similar codes were then grouped together so that themes and subthemes could be identified. The researcher interpreted the themes in line with the study objectives.

Quality Control

The tools were pretested in Maseru district to identify questions that needed to be adjusted to fit the local context before data collection. One research assistant was trained on how to administer the tools to ensure that relevant data was collected. The researcher and research assistant ensured that collected data is complete and accurate before they left the respondents.

Ethical Considerations

The study proposal was reviewed by the board of Faculty of Health Sciences, Uganda Martyrs University, to ensure that all potential ethical issues have been properly addressed. The researcher was then given an introductory letter to prove authorization by the university to conduct the study. The similar approval was also sought from Lesotho's MOH Research and Ethics committee, as the DHMTs are under the stewardship of the MOH. The researcher and research assistant clearly explained to the respondents about the aim and objectives of the study and asked them to participate in the study through a process of informed consent.

Article DOI: 10.52589/IJPHP-RVH2FVEP
DOI URL: https://doi.org/10.52589/IJPHP-RVH2FVEP

Confidentiality and anonymity of respondents was maintained throughout the study by ensuring that no personal information was recorded on data collection tools. The final report of the study was shared to all DHMTs and hospitals that participated in this study.

Limitations of the study

Not all key informants were available to be interviewed on the days of data collection as some had gone for leaves. Due to the health workforce crisis in Lesotho, some positions were also vacant.

Dissemination of results

Copies of the final study report will be shared to all DHMTs that took part in this study and the MOH. The other copy will be submitted to Uganda Martyrs University, where it will probably be placed in the library for other students to access it. If suitable, the results of the study will be sent for peer-review in an internationally recognized journal to be appraised for publication.

RESULTS/FINDINGS

The level of HMIS use in DHMTs and District Hospitals

The study measured the level of HMIS data use in DHMTs and district hospitals per five HMIS data use indicators. The level of HMIS data use was measured on a scale of 0 to 4, whereby 0 indicated no use of HMIS data by the facility while 4 indicated good use of HMIS data by the facility. The scores were also colour coded to enable easy analysis of the results. Green (4) signified good use, yellow (3) moderate use, blue (2) low use, pink (1) very low use and red (0) no use of HMIS data at all by the facility.

The overall level of use by each facility, however, was rated on the scale of 0 to 20 whereby a score of zero indicated no use of HMIS data, 1-5 very low use, 6-10 low use, 11-15 satisfactory use and 16-20 outstanding use of HMIS data by the facility. The overall level of use per each indicator by all facilities (DHMTs/ hospitals) was expected to be 16, whereby a score of 0-4 showed no use or very low use of HMIS data, 5-8 low use, 9-12 satisfactory use and 13-16 outstanding use of HMIS data.

Overall performance score of HMIS data use in the region was expected to be 80, whereby a score of 60-80 indicated outstanding use of HMIS data, 40-59 satisfactory use, 20-39 low level of HMIS data use and 0-20 very low or no use of HMIS data use. Average scores were also calculated to determine the overall rating of HMIS data use in the region, and per the indicators.

The results showing the level of HMIS data used in DHMTs are presented below.

Article DOI: 10.52589/IJPHP-RVH2FVEP
DOI URL: https://doi.org/10.52589/IJPHP-RVH2FVEP

Table 6: The level of HMIS data use at DHMTs

Indicator	DHMT A	DHMT B	DHMT C	DHMT D	Total score	Average score
Setting performance indicators for the district	4	4	4	4	16	4
Setting targets to achieve in a financial year based on the baselines	3	4	2	2	11	2.8
Monitoring of performance through report generation and displaying performance of the district	2	4	2	3	11	2.8
Using HMIS to evaluate health services performance at the district	3	4	0	2	9	2.3
Using HMIS for decision making at the district	3	4	0	2	9	2.3
Overall performance	15	20	8	13	56	14

Table 6 shows that one DHMT has an outstanding level of HMIS data use while two DHMTs have satisfactory level of HMIS data use. One DHMT has a low level of HMIS data use. All DHMTs make good use of HMIS for setting key performance indicators. They also use HMIS data satisfactorily for target setting, monitoring of performance, evaluation of health services performance and decision making. The overall level of HMIS data use in the region is satisfactory.

The level of HMIS data use at district hospitals was measured in the same manner as above. The results showing level of HMIS data use at district hospitals are also tabulated below.

Table 7: The level of HMIS data use at district hospitals

Indicator	Hospital A	Hospital B	Hospital C	Hospital D	Total score	Average score
Setting performance indicators	4	4	4	4	16	4
Setting targets to achieve in a financial year based on the baselines	3	3	2	2	8	2.5
Monitoring of performance through report generation and displaying performance of the hospital	3	4	1	3	11	2.8
Using HMIS to evaluate health services performance at the hospital	3	4	0	2	9	2.3
Using HMIS for decision making at the health hospital	2	4	0	1	7	1.8
Overall performance	15	19	7	12	53	13.2

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Table 7 shows that one district hospital has an outstanding level of HMIS data use while two district hospitals have satisfactory level of HMIS data use. The results also show that one district hospital has a low level of HMIS use. All hospitals make good use of HMIS for setting performance indicators. However, the use of HMIS data for setting targets and making decisions is quite low while it is satisfactory for monitoring performance and evaluating health services. The overall level of HMIS data used by district hospitals in the region is satisfactory as well.

DISCUSSION

The findings have shown that both DHMTs and district hospitals are using HMIS data satisfactorily. This is contrary to findings of several studies which were conducted in developing countries whereby the level of HMIS data found to be generally low (Avan et al., 2016; Seitio-Kgokgwe, 2015; Kiberu et al., 2014). This is possibly due to numerous interventions which have been taken in the last decade to improve the performance of the HMIS in Lesotho. The findings in both DHMTs and district hospitals also look similar because most DHMT members head different units in the district hospitals due to the health workforce crisis in Lesotho. In addition, DHMT offices are found in district hospital's yards.

While the results showed that all DHMTs and hospitals have set key indicators to be used to track performance across key aspects of the health system, objective and target setting for the KPIs still needs more improvement. In line with the findings of Avan et al. (2016) from their study in Ethiopia, district and hospital managers are being guided mostly by national targets. They have not been trained how to set targets for themselves, and also do not have autonomy to do so. This has resulted in some data elements being routinely collected without being used to monitor their intended KPIs, and thus implying failure to maximise organisations' resources. Due to inadequate target setting for KPIs, the use of HMIS data for monitoring of performance also needs to be improved in some districts. This was revealed by the fact that some core indicators were neither displayed nor included in the quarterly performance reports. Those that were displayed were mainly of particular interest to donors or those selected for facility's appraisal in the PBF program.

Managers in both DHMTs and district hospitals do not comment on or interpret most KPI data displays and charts or tables presented in performance reports. This raised questions about whether they do understand what the analyses mean or not, because it is clear that managers will only use data if they understand what it means (Nutley et al., 2014). It was therefore clear that the use of HMIS data for evaluation of performance still needs improvement in order to maximise the benefits of HMIS. Nonetheless, it was also evident that those who analysed data for themselves understood it better than those who relied on data clerks and DHIOs to assist them with data analysis. Inadequate interpretation of analyses surely contributed to low HMIS data use for decision making in district hospitals. Similar to the findings of Thomas (2016), it was also apparent that DHMTs do not have autonomy to make strategic plans and policies for the districts because such are made from the national level. Decisions about strategic plans are quite centralised and this hampers the ability of managers to prioritise resource allocation to certain services or departments as instigated by local HMIS data. Contrary to the findings of Avan et al. (2016), managers still proved to be using HMIS data to conduct situational analyses

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of certain services or public health problems and make decisions without having to refer them to the central level.

IMPLICATION TO RESEARCH AND PRACTICE

The MOH may consider creating a budget vote specifically for HMIS to support it with financial resources needed to improve its performance. Moreover, the ministry should absorb data clerks into their public service force and make their positions permanent to maintain the quality of data and perhaps assist in-charge nurses with data analysis and use for local decision making. Individuals who use HMIS data more could be awarded to encourage others to do the same. The awards should not necessarily be monitory, but even mere recognition could motivate the managers. Performance appraisal of health managers could also assess the level of HMIS use by individuals.

CONCLUSION

This study was set out to identify enablers and constraints to the effective use of HMIS in the southern region, Lesotho. This was done by determining the level of HMIS data use and factors responsible for the observed use in DHMTs and district hospitals. It was found that HMIS data is being used satisfactorily by both DHMTs and hospitals for evidence based decision making. The level of its use is associated with behavioural, technical and organisational factors.

Future Research

For further research around this topic, researchers could assess in depth how the level of decentralisation affects the use of HMIS data at district level. Future studies may also evaluate the contribution of a well performing HMIS to the overall performance of the health system.

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