FACTORS ASSOCIATED WITH PERFORMANCE OF HEALTH MANAGEMENT INFORMATION SYSTEM AMONG SELECTED HEALTH FACILITIES IN HAI DISTRICT, TANZANIA

FAUSTINE MFUNGO PAMBA

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN MONITORING AND EVALUATION (MAME)

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CERTIFICATION

The undersigned certifies that he has read and here by recommends for acceptance by the Open University of Tanzania a dissertation entitled; “Factors associated with performance of health management information system among selected health facilities in Hai district, Tanzania” in partial fulfilment of the requirements for the award of Degree of Masters of arts in Monitoring and evaluation (MAME).

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Prof. Emmanuel Nyankweli

(Supervisor)

……..……

Date

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DECLARATION

I, **Faustine Mfungo Pamba,** declare that, the work presented in this dissertation is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfilment of the requirement for the Degree of Masters in Monitoring and evaluation.

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Signature

15/05/2025

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Date

DEDICATION

This work is dedicated to my beloved wife Crecensia Msuya and our beloved daughters Bertha, Charity and Shine. Without their support it would not have been possible to complete this dissertation.

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The evaluation report is a product of various inputs from different stakeholders. In sight of the fact that the space does not permit to reveal all of them, I am grateful to everybody who in one way or the other contributed to the achievement of this work. However, I would like to mention a few individuals whose contribution amounted to the production of this report.

With heartfelt thanks to everyone, and in no particular order, I would like to mention these few on behalf of the rest: First, Prof. Emmanuel Nyankweli my major supervisor, for his regular guidance throughout the entire period of the study. Second, Dionis Mnyinga, District Executive Director, Hai District Council; Dr Itikija Msuya, District Medical Officer, for accepting my request for field attachment at their organizations. Special thanks are also due to all participants, who devoted their valuable time to participate in this evaluation.

ABSTRACT

HMIS is a comprehensive data management system designed to collect, store, analyse, and disseminate health-related information. Understanding the HMIS is essential for addressing healthcare challenges, particularly those intensified by limited resources, as it has the potential to enhance healthcare delivery. Therefore, this study aims to assess the factors associated with HMIS performance among selected health facilities in Hai District. Specifically, identifying technical, organizational, and behavioural factors influencing HMIS performance. The study adapted to a quantitative and qualitative design targeting 57 health facilities. The sample size of the study was 35 health care providers from sampled 9 health facilities. Data was collected through questionnaires and structured interview guide. Analysis of quantitative data was analysed through descriptive statistics using the aid of Statistical Package of Social Sciences, while qualitative data was analysed through thematic content analysis. Quantitative data was presented in form of tables, percentage, means and standard deviations. The study found out that health facilities have access to HMIS documentation materials. It was concluded that technological factors were statistically significant to the performance of HMIS within Hai District. Regarding, organization factors it was concluded that organizational factors were significantly associated with the performance of HMIS system among the healthcare workers. Also behavioural factors associated with HMIS performance were not considerable factors influencing healthcare workers. It was recommended that policy makers and stakeholders should ensure that health facilities are equipped with up-to-date technology and a reliable power supply, alongside ongoing training for healthcare workers.

Keywords: *Performance, Health, Information System, Hai District.*

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LIST OF ABBREVIATIONS AND ACRONYMS

CMO	Chief Medical Officer
DEAT	Data Entry and Analysis Tool
EDP	Essential Drugs Programme
HMIS	Health Management Information System
RMIS	Routine Health Information System
HSSP	Health Sector Strategic Plan
IHRDC	Ifakara Health Research and Development Centre
LGA	Local Government Authority
MOHSW	Ministry of Health and Social Welfare
MTUHA	Mfumo wa Taarifa za Uendeshaji Huduma za Afya
NACP	National AIDS Control Program
NGOs	Non-governmental organizations
OBAT	Organization and Behaviour Assessment Tool
PRISM	Performance of Routine Information System Management
PRISM	Performance of Routine Information System Management
SWAP	Sector Wide Approach
UDSM	University of Dar es Salaam
UiO	University of Oslo

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter covers the general introduction about the Health Management Information System (HMIS) which includes, background of the study, statement of the problem, the main objective, specific objectives, research questions, the scope of the study, limitations, significance, and the organization of the study. HMIS is one of the six fundamental health system building blocks identified by the World Health Organization (WHO). HMIS is a structured system that facilitates the collection, storage, compilation, transmission, analysis, and application of health data to support decision-making (Mboera, et al., 2021).

1.2 Background of the Study

Health Management Information Systems (HMIS) play a pivotal role in effectively delivering health services, particularly in resource-limited settings (Dakika & Saronga, 2024). HMIS is a comprehensive data management system designed to collect, store, analyse, and disseminate health-related information (Agago, et al., 2019). These systems facilitate the collection, analysis, and dissemination of data, enabling healthcare providers to make informed decisions, allocate resources efficiently, and improve patient outcomes (Mboera, et al., 2021).

Understanding the Health Management Information System (HMIS) is essential for addressing healthcare challenges, particularly those intensified by limited resources, as it has the potential to enhance healthcare delivery through improved data management practices. This, in turn, contributes to better health outcomes for the

community. However, the data usage in many sub-Saharan African (SSA) countries, including Tanzania, is shallow, affecting the HMIS's performance.

A Health Information System (HIS) denotes the main idea of a formal and organized system established to aid and enhances health management decision-making across various health system levels. Globally, studies have shown that the integration of technology, user training, and stakeholder engagement are critical for successful HMIS implementation (Kanjo et al., 2022). In the study by Moukénet et al (2021), it was suggested that the HMIS data quality may be improved by the improvement of working conditions for health personnel. Further, in Malawi, Kanjo et al, (2022) indicated that at national and district level, there is an aggregated health management information system (HMIS); while at health facility level, there are different information systems and different electronic medical records systems (EMRs).

In the East African context, studies have identified challenges such as inadequate infrastructure, lack of trained personnel, and insufficient funding as major barriers to effective HMIS performance (Dakika & Saronga, 2024). Moreover, Meghani et al (2021), revealed several reasons associated with the unsatisfactory quality and performance of HMIS, including technical reasons, inadequate staff, and healthcare providers' behaviours. Furthermore, Nshimyiryo, et al., (2020) in Rwanda recommended that data quality assessments and training could be done address gaps and to help improve HMIS data quality.

Tanzania as one of developing countries, Health systems significantly trail behind those in the developed world when it comes to utilizing HMIS (Kuwawenaruwa, et

al., 2023). In Tanzania, health care is provided through a decentralized system. The Prime Minister's Office, Regional Administration, and Local Government are in charge of service delivery through health facilities such as primary healthcare dispensaries, health clinics, and district hospitals (MTUHA Guideline, 2017). These serve as the first line of defense against illness and diseases.

Various efforts have been invested in improving healthcare services globally. Improving the quality of health service, for instance, is a significant component of the Millennium Development Goals (MDGs) (Bahreini et al., 2021). However, there are several factors affecting the performance of HMIS that limit the improvement of health care delivery. Several studies have highlighted barriers and factors associated with the performance of the HMIS. In Tanzania, factors such as insufficient human and financial resources, a lack of incentives and supervision, and the absence of standard operating procedures for data management significantly affected the performance of the HMIS (Mboera, et al., 2021).

Furthermore, lack of skills for data interpretation and utilization, policy guidelines on information for local action and human capacity building as well as a lack of flexible systems were among the factors associated with poor HMIS performance (Kimaro HC, Twaakyondo HM 2015). HMIS offers chances to support health decision-making at every level of the health system (Qian et al., 2023). Its value is only recognized when it turns the data collected into useful information and knowledge that leads to action. Despite the growing body of literature, there is an absence of focused studies that delve into the specific technical, organizational, and behavioural factors affecting HMIS performance. Most existing research tends to

generalize findings across broader contexts, often overlooking the unique challenges and dynamics present in Tanzania. This gap underscores the need for localized studies that will inform stakeholders about the specific factors associated with HMIS performance among health facilities in Tanzania. Therefore, this study seeks to identify the factors associated with the performance of HMIS among selected health facilities in the Hai District, Tanzania.

1.3 Statement of the Research Problem

An effective Health Management Information System (HMIS) is essential for delivering healthcare efficiently, particularly by ensuring high data quality and facilitating informed decision-making. However, in many low- and middle-income countries (LMICs), including Tanzania, the performance of HMIS remains inadequate, significantly affecting both data quality and the utilization of health information. This deficiency hinders critical decision-making processes necessary for improving health outcomes.

Research conducted in various regions of Tanzania, such as Arusha, Lindi, and Geita, has highlighted that healthcare providers often lack the skills needed to analyze and utilize family planning data effectively (Mackfallen et al., 2019). Additionally, studies indicate that Tanzanian health providers face challenges in data management, analysis, and interpretation (Rumisha et al., 2020). In Kenya, similar findings reveal low capacities among healthcare providers in data processing, which impedes their ability to leverage data for planning and decision-making (Nyatogo, et al., 2023). In Rwanda, the limited use of data in health facilities has been attributed to a top-down approach in setting targets and planning (Nisingizwe, et al., 2014).

Several studies have identified barriers affecting HMIS performance. A recent investigation in Tanzania revealed that a significant proportion (41.4%) of health facility personnel had not received training on HMIS. Furthermore, less than half (42%) of facilities reported that district supervisors provided supportive oversight on HMIS usage, and only 54% of participants received feedback on reporting quality, primarily in oral form (Rumisha et al., 2019). This indicates poor data quality among selected health facilities, with both Mbulu and Hai Districts showing particularly low performance.

Inconsistencies in findings across these studies may stem from variations in data collection tools and methodologies. Therefore, this study aims to assess the factors associated with HMIS performance among selected health facilities in Hai District. Specifically, it will identify technical, organizational, and behavioral factors influencing HMIS effectiveness, utilizing a standardized PRISM toolkit for comprehensive evaluation.

1.4 Research Objectives

1.4.1 General Objectives

The main objective of this study was to assess the factors associated with health management information system (HMIS) performance among selected health facilities in Hai district.

1.4.2 Specific Objectives

i. To identify technical factors associated with health management information system (HMIS) performance among selected health facilities in Hai district.

ii. To identify organizational factors associated with health management information system (HMIS) performance among selected health facilities in Hai district.

iii. To investigate behavioral factors associated with health management information system (HMIS) performance among selected health facilities in Hai district.

1.5 Research Questions

1.5.1 Broad Research Question

What are the factors associated with health management information system (HMIS) performance among selected health facilities in Hai District?

1.5.1.1 Specific Research Questions

i. What are the technical factors associated with health management information system (HMIS) performance among selected health facilities in Hai district?

ii. What are the organizational factors associated with health management information system (HMIS) performance among selected health facilities in the Hai district?

iii. What are behavioral factors associated with health management information system (HMIS) performance among selected health facilities in the Hai district?

1.6 Significance of the Study

HMIS is crucial in facilitating health management decision-making at different health system levels. Therefore, this study will provide baseline information on

factors associated with HMIS performance to HMIS in primary health care in Tanzania. In a previous study by Rumisha, et al., carried out in different health facilities in Tanzania, data utilization and quality were among the significant problems identified. So, the current study will evaluate the factors associated with HMIS performance in the selected health facilities in the Hai district council. The study's findings and recommendations would contribute to the ongoing efforts to develop a better HMIS. Specifically, the results of this study would assist facilities and institutions in recognizing their shortcomings in implementing HMIS and suggest better methods to enhance data quality and usage.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

A health management information system (HMIS) is a structured system designed to gather, store, assemble, transmit, analyze, and use health data to help make decisions. A Health Information System (HIS) is defined by the World Health Organization (WHO) as a structured and organized system meant to enhance health management decision-making at various levels of the health system (WHO, 2004). It was designed to manage both epidemiological data (such as health prevalence, incidence, mortality, and morbidity statistics) and administrative data (resource and service consumption).

HMIS comprises both Routine and Non-Routine Systems. Routine Health Information Systems collect continuous data on health status, interventions, and resources. Examples include facility-based service statistics, vital event registration, and community-based information sources. . The collected data must be processed to generate information, which is essential for decision-making at every level of health service.

2.2 Conceptual Definitions

2.2.1 System

A "system" is simply described as a collection of components that collaborate to achieve a common goal. In the case of a health information system, its objectives are to improve health services administration through appropriate information assistance (Lippeveld, et al., 2000).

2.2.2 Health System

Health system: This term refers to any actions whose primary goal is to promote, restore, or maintain health (WHO, 2000). According to (DHIS 2, 2017) A health system is the arrangement of people, institutions, and resources that provide healthcare services to address the health needs of specific populations. In this case, the health system is the way resources and people are organized to provide health services. Its main purpose is to meet the health needs of the people who are receiving these services. This means making sure that the right services are available and easy for the community to access.

2.2.3 Information

Information: Information is the meaningful gathering of facts or data. In other words, it is data that has been reduced, summarized, and organized. Data itself is a collection of facts and observations that have little significance when viewed on their own (Ignou, 2017).

2.2.4 Information System

Information system: A system that supports decision-making at all organizational levels by supplying data. An information system is defined here as one that is designed to collect, process, store, and distribute health data in order to facilitate decision-making.

2.2.5 Health Information System

Health Information System: A system that combines data collection, processing, reporting, and the use of information needed to enhance the effectiveness and efficiency of health services through better management at every level of healthcare (Ignou, 2017). Health information system is a prerequisite for increasing the

efficiency of health services.

2.2.6 Management Information System

Management information system: A formal method of making available accurate and timely information to management that is necessary to facilitate the decision-making process and enable the organization's planning, control and operational functions to be carried out effectively.

2.2.7 Health Management Information System

The application of information system management ideas to health care systems is known as the health system for management information is an information system created specifically to help with health program administration and planning rather than actual care delivery. Producing high-quality data and using it to inform management choices to enhance the delivery of health services is the ultimate objective of the Health Management Information System (HMIS) (MTUHA Guideline 2017).

2.3 Critical Review of Supporting Theories

This study was grounded by Systems theory developed by Ludwig von Bertalanffy in the 1940s. System theory emphasizes the importance of understanding complex phenomena by viewing them as integrated wholes rather than merely as the sum of their individual parts. By focusing on the relationships and interactions among components, Systems Theory provides a framework for analysing how various elements within a system influence one another. Systems Theory is built on assumptions that systems must be viewed in their entirety to fully understand their

functioning. Further, it posits that components within a system are interdependent; changes in one part can significantly affect the entire system. Additionally, Systems Theory recognizes that systems are dynamic, constantly interacting with their environment and adapting over time. Furthermore, it emphasizes that systems are open, exchanging information, energy, and materials with their surroundings, which can influence their development and operations.

2.3.1 Strengths and Weaknesses of Systems Theory

One of the primary strengths of Systems Theory is its comprehensive perspective. This theory is highly interdisciplinary, applicable across various fields such as biology, sociology, and management, thus facilitating insights that can be beneficial in different contexts. Moreover, the emphasis on relationships and interactions can lead to more effective problem-solving and decision-making processes. However, Systems Theory is complex, making it challenging to identify specific causes and effects, complicating analysis and intervention strategies.

2.3.2 Relevance of Systems Theory

In the context of assessing the performance of Health Management Information Systems (HMIS) among selected health facilities in Hai District, Systems Theory holds significant relevance. This study recognizes that HMIS is not merely a collection of isolated data points but a complex system influenced by a multitude of technical, organizational, and behavioral factors. By applying Systems Theory, the research identified how these different factors (behavioral, technological, and organizational) interact and contribute to HMIS performance. Further, understanding these interconnections is essential for developing effective interventions. By

recognizing the adaptive nature of health information systems, the study proposed strategies that respond to the evolving challenges faced by HMIS. Ultimately, leveraging Systems Theory enhanced the understanding of HMIS performance in Hai District, enabling targeted strategies that address root causes of inefficiencies and improve health outcomes for the population.

The PRISM conceptual framework and tools help identify the strengths and weaknesses of Routine Health Information System (RHIS) performance and related factors. These tools can be used to create a new system, assess an existing one, or measure the effects of interventions on RHIS.

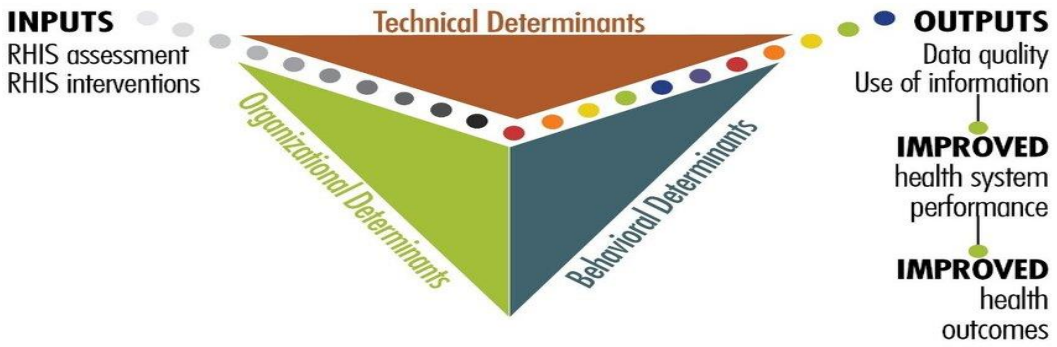

Figure 2.1: Conceptual Framework of the HMIS Performance

The conceptual framework presented highlights the relationship between the Performance of Health Management Information Systems (HMIS) and Factors associated with performance of HMIS. Understanding these relationships is crucial for enhancing the effectiveness of HMIS in improving health outcomes. At the core of the framework is the Performance of HMIS, which serves as the dependent variable. This performance encompasses how effectively the system collects, manages and utilizes health data to support informed decision-making. High-performing HMIS are characterized by accurate data collection, timely reporting, and effective data

utilization, all of which are essential for improving health outcomes in the population served.

The independent variables are the factors associated with the performance of HMIS. The first factor, Technical Determinants, includes the technological infrastructure and tools available for data management. This encompasses the quality of software and hardware, as well as the training provided to healthcare staff in using these technologies. Enhanced technical capabilities lead to improved data accuracy and usability, which are vital for effective health information management. Further, Organizational Determinants refers to the structural and policy aspects within health facilities that support HMIS. Factors such as leadership commitment, resource allocation, and the presence of supportive supervision play a critical role in fostering an environment conducive to effective HMIS operation. A strong organizational framework ensures that the necessary resources and support are available, promoting better data practices and accountability among staff.

Lastly, Behavioral Determinants focuses on the attitudes, skills, and practices of healthcare providers who utilize the HMIS. Training and ongoing capacity building are essential to equip staff with the skills needed for effective data management and analysis. Positive behaviors toward data use, such as recognizing its importance in patient care and program planning, further enhance overall system performance.

2.4 Empirical Analysis of Relevant Studies

Health Management Information System

A system that is designed to facilitate the gathering, storing, compiling, transmitting,

analyzing, and using health data for decision-making is known as a health management information system, or HMIS. The term "health information system" (HIS) refers to the widely accepted idea of a formal, structured system of health data that is designed to assist and enable decision-making related to health management at various levels of any health system, especially primary health care. It was intended to hold administrative data (utilization of resources and services) as well as epidemiological data (statistics on health prevalence, incidence, death, and morbidity) (Mwangu MA, 2005).

Both non-routine and routine systems are included in HIS. Regular Health Information Systems comprise continuous data gathering of health status, health interventions, and health resources, such as vital event registration, facility-based service statistics and community-based information systems sources. Data collected need to be processed to provide information that is crucial for decision-making at all levels of health service (Mucee, 2016).

HMIS in Developing Countries

Health systems in many developing countries fall significantly behind those in the developed world when it comes to using Health Management Information Systems (HMIS). The World Bank, along with other international donor organizations, is often asked to offer technical and financial support in this area, but successful examples are still uncommon. For instance, in certain developing countries like Uganda, an HMIS performance assessment was conducted to highlight the need for HMIS. The identified problems were the lack of data ownership at the level of health facilities, lack of funding, and lack of capable human resources, thus impairing

healthcare delivery (Umezuruike C 2017).

Furthermore, in Kenya, with the technical assistance of the University of Oslo, the Ministry of Health and its donor partners supported the implementation of a district health information system (DHIS2) with the expectation that it would increase the use of information in health services management at the local level (Dehnavieh R 2019). DHIS2 is a cloud-based application used for collecting and analyzing health data. Following the devolution in 2010, the Government of Kenya established 47 counties that replaced the previous districts and provinces. Each county government was accountable for supporting DHIS2 in its region and had complete control over how to use health data to manage its services.

Data collected at health facilities were entered into DHIS2 at sub-county and county levels and made accessible to all HIS users in the country. Some HIS officers recalled how hard it was to be involved in health management teams before devolution. By contrast, after devolution, the impact of DHIS2 and the use of health information were more evident in those counties where HIS officers and health management teams worked hand-in-hand, as a national HIS officer suggested (Sabrina Bonomi, 2019).

Health Information System Decentralization in Tanzania

The lack of reliable health information at the lower levels of the health system was a key reason why the Ministry of Health, with help from donor agencies, established the HMIS. They believed that by decentralizing the Health Information System, the use of health data to manage and deliver local health services would improve.

Several studies show the HMIS performance in Tanzania could be better in terms of data quality and usage, which warrants further studies (Dehnavieh, 2019).

2.5 Research Gap

In Tanzania, the HMIS is the primary information system, and it was established during the early 1990s. It comprises facility-based health records used for routine health services management, providing indicators for data on morbidity, mortality, health infrastructure, and service coverage. Despite huge investments made in this direction, these systems have not made any radical impact on the delivery of healthcare for local communities. Recent studies in Tanzania revealed that HMIS's poor data utilization and quality, thus impairing the performance of HMIS in proper evidence-based decision-making (Simba & Sukums, 2022). Strong HMIS has been identified as critical for addressing health challenges and improving health service delivery at all levels of the health system. Therefore, the current proposed study aims to find factors influencing the performance of the HMIS in selected health facilities in Hai district, Kilimanjaro region.

2.6 Conceptual Framework

The conceptual framework outlines the parameters used to evaluate the performance of Health Management Information Systems (HMIS), focusing on two key dimensions: Data Quality and Information Use. Data Quality is essential for reliable HMIS performance and includes three main parameters: Accuracy ensures that data accurately reflects events at healthcare facilities; Completeness assesses whether all necessary data elements are reported and whether all facilities participate in data reporting; Timeliness evaluates whether data is submitted by required deadlines, as

delayed reporting can hinder effective decision-making; and the Information Use which refers to how the data generated by HMIS is applied in decision-making and strategic planning. Key activities include the production of regular health service reports, supportive supervision from health authorities, and revising strategies based on data insights. Effective information use also facilitates resource mobilization and advocacy for more resources, while promoting transparency through information dissemination.

The relationship between data quality and information use is cyclical and interdependent. High-quality data enhances effective information use, leading to improved decision-making and resource allocation. Conversely, effective information utilization can highlight data quality issues, prompting necessary improvements. Together, these dimensions contribute to the overall performance of HMIS and facilitate better health outcomes for the population served. Figure 2.2 shows the parameters used to evaluate the performance of the HMIS.

Figure 2.2: Parameters used to evaluate the Performance of the HMIS

Independent and Dependent Variables

The assessment of Health Management Information Systems (HMIS) performance involves a clear distinction between independent and dependent variables, as illustrated in Figure 2.3. Understanding the relationship between these variables is essential for evaluating how various factors influence HMIS effectiveness. Independent Variables are those factors that can influence or predict changes in the performance of HMIS. In this framework, independent variables are categorized into three main groups: Technical Factors, Organizational Factors, and Behavioural Factors.

Technical Factors include elements such as the complexity of the system, the design of HMIS, and the intricacies of information technology (IT). These factors determine how easily users can interact with the system and the overall functionality of the HMIS. Further, Organizational Factors encompass the internal structures and processes within healthcare organizations. This includes management functions, resources available for training, financial support, and the distribution of information. These factors affect how effectively the HMIS is implemented and utilized.

On the other hand, the Dependent Variables represent the outcomes or results that are influenced by the independent variables. In the context of HMIS performance, these dependent variables include data quality, information use, and Information Use. Data Quality refers to the accuracy, completeness, and timeliness of the data collected within the HMIS. High data quality is essential for reliable decision-making and effective healthcare delivery. Further, Information Use encompasses how effectively the data generated by the HMIS is utilized for decision-making,

strategic planning, and resource allocation. Effective information use contributes to improved health service performance and better health outcomes.

The relationship between independent and dependent variables is dynamic and interdependent. Improved technical factors, such as a user-friendly design and robust IT support, can lead to enhanced data quality and more effective information use. Similarly, strong organizational factors can foster an environment where data quality is prioritized and information use is maximized.

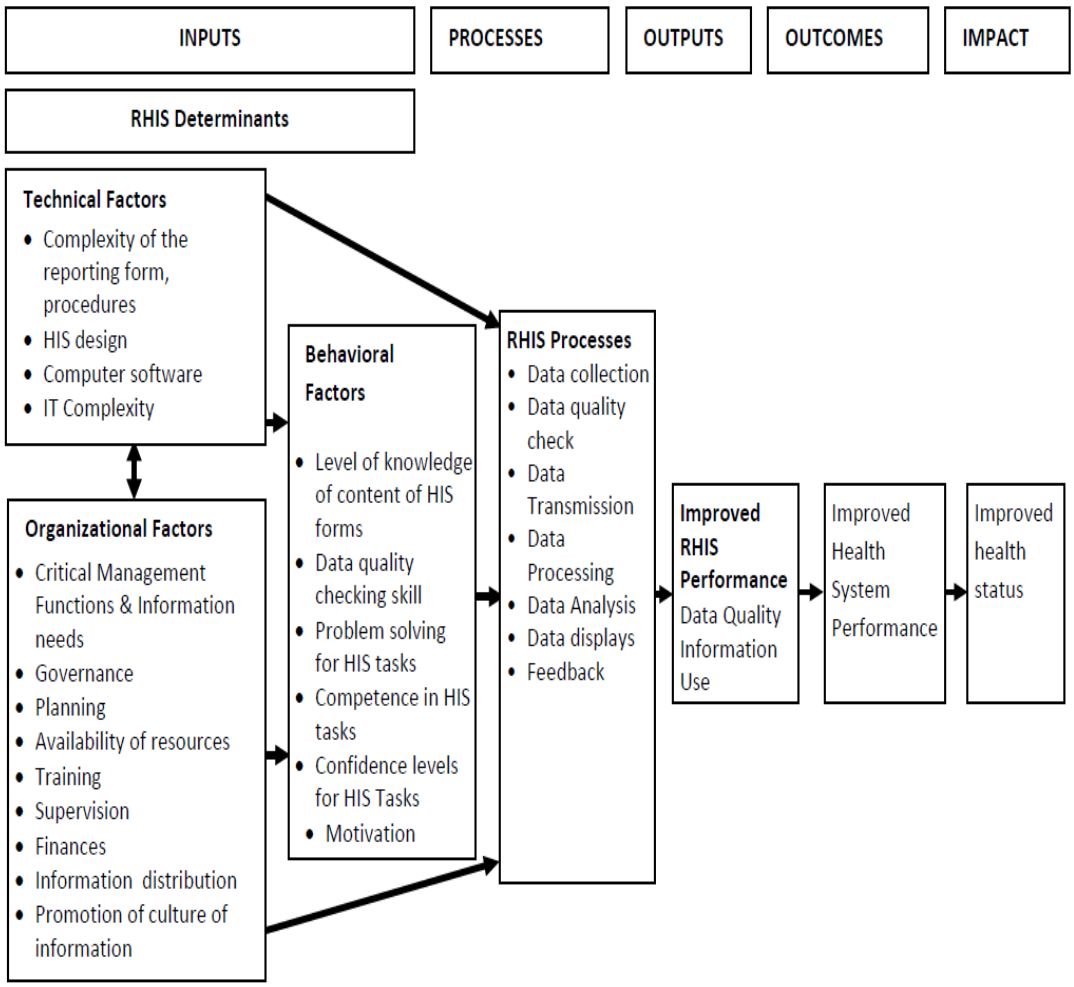

Figure 2.3: Conceptual Framework of the HMIS Performance
Source: Adopted from Measure Evaluation for RHIS

2.7 Theoretical Framework

2.7.1 Technical Factors associated with Health Management Information System (HMIS) Performance

The most obvious determinants of health management information system performance relate to the technical aspects of the system. These are the nuts and bolts of the system and are typically where information system developers focus their energy. Technical determinants include establishing a standard set of indicators, ensuring that people are trained to complete the appropriate forms, designing data collection forms that streamline the amount of data collected, providing appropriate technology for data analysis, transfer, and presentation, providing user-friendly forms for reporting results, so that the information is easy to visualize, understand, and interpret (Simba D. 2019).

A recent study on the data quality and factors influencing the performance of HMIS in Tanzania showed a poor utilization of data. This study identified technical factors associated with the poor performance of the HMIS, which were inadequate training, lack of standard procedures, and lack of HMIS tools for data management. Other studies in Tanzania showed the low utilization of the HMIS data tools and thus led to poor HMIS performance in terms of data quality. This has led to poor utilization of the data in health-related decision-making. Other findings were seen in other studies carried out in low and middle-income countries (Karuri J 2014).

The findings of these studies are inconsistence which necessitates further studies. The possible explanations can be the differences in technological advancement, socio-cultural system, the tool/methodology used to conduct a study, and the level of

socio-economic status of the particular country.

2.7.2 Organizational Factors Associated with Health Management Information System (HMIS) Performance

Organizational determinants are also known as environmental or systemic factors. These elements affect the context in which data collection, management, and use occur. A culture of information refers to an organization's ability to encourage values and beliefs among its members, enabling them to collect, analyze, and use information to achieve the organization's goals and mission. This requires commitment and support from the organization. Organizations need to dedicate various resources, including human resources, RHIS forms and supplies, and infrastructure like utilities, transportation, and information and communication technology (ICT). In most the low and middle-income countries, the organizational determinants of HMIS are sub-optimal (Simba D. 2019).

Several studies have highlighted the organizational factors that influence the performance of the HMIS in Tanzania. Lack of supportive supervision was among the organizational factors revealed by (Mboera et al., 2020). In Ethiopia, adequate supportive supervision was associated with good HMIS performance. The findings of these studies are inconsistence and the possible explanation could be the differences in acceptance of the HMIS, socio-cultural systems, and economic status,
Good quality information and well-organized with good HMIS performance are required to monitor health, as well as to evaluate and improve the delivery of healthcare services. However, there is a significant disparity in the accessibility and availability of such information in many low and middle-income countries.

2.7.3 Behavioral Factors Associated with Health Management Information System (HMIS) Performance

Behavior determinants refer to individual behavior of people who are meant to collect, manage, and use data. Implementing HMIS always requires changes in the way people behave. People need to be motivated to use data. When they value data, they are more likely to care about its quality. Health workers and managers need to TRUST the data enough to make decisions based on information rather than relying on old decision-making habits (i.e., political and experiential). Well-trained workers must have the confidence to use data to make decisions (Mboera, et al., 2019).

Several studies have reported on the influence of behavioral factors on the performance of the HMIS. Studies in Ethiopia reveal that poor HMIS performance could be attributed to poor information use practice, as some of the healthcare workers were unable to interpret the information collected in HMIS. In Liberia, healthcare workers had poor problem-solving capacity, poor confidence to carry out the given task, and poor motivation. Furthermore, a recent study in Tanzania showed that poor supportive supervision on the use of HMIS could contribute to poor performance as well as a lack of data usage culture.

Among these studies, their findings are inconsistent. This could be explained by the differences in technology advancement, socio-cultural systems, and tools and methodology used during the survey. Using data for evidence-informed decisions is still limited in many low- and middle-income countries. In 2011, MEASURE Evaluation created the Performance of Routine Information System Management (PRISM) Framework and a set of tools for global use. These tools help assess the

reliability and timeliness of routine health information systems, support evidence-based decision-making, and identify gaps that need to be addressed to improve the system and achieve better health outcomes.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Strategies

The research design is the plan or strategy that uses proven methods, rules, and guidelines to help carry out a study. Researchers decide on the design before they submit their study for ethical approval and begin collecting data. (Majid et al., 2018). This study aims to assess the knowledge, attitudes, and practices (KAP) of healthcare providers at the facility level about using HMIS data for decision-making. Stratified sampling involves dividing the population into different groups and then randomly selecting samples from each of those groups.

A subgroup consists of related items. Stratified sampling is commonly used when there is significant variation within a population. The goal is to make sure that each subgroup is properly represented (Taherdoost, 2016). Purposive sampling is a method where specific people, settings, or events are chosen intentionally to gather important information that might not be available through other methods. In this approach, the researcher selects participants they think are valuable for the study (Taherdoost, 2016).

Purposive sampling was used to obtain a sample of healthcare providers from selected health facilities who participated in the study. Quantitative data were collected using adopted questionnaires from the PRISM toolkit that was designed for the evaluation of HMIS performance. Assessment of the technical, behavioral and organizational factors was conducted by administering different tools as stipulated by the PRISM framework. In-depth interviews (IDIs) with one selected healthcare

worker were used to collect qualitative data. A structured IDI guide was administered by trained researchers on qualitative research methods to ensure the quality of the data collected.

3.2 Survey Population

This study involved five health facilities that were selected using stratified random sampling to ensure the actual representation of 57 health facilities that participated in the study. These facilities included one hospital (government-owned), two health centers (owned by the government), and two dispensaries (owned by the government).

3.2 1 Inclusion Criteria

The criteria for participation include healthcare providers who have regularly interacted with clients and have provided services for a significant period. These individuals often collect health data and make most decisions regarding health service delivery at the facility level. Participants must have at least six months of experience before the survey period.

3.2.2 Exclusion Criteria

Job experience less than six months and those who will fail to consent.

3.3 Area of the Research

This study was carried out in Hai District in the Kilimanjaro region. Hai District was split from Moshi District in the year 1975. It had an area of 1,075 square kilometers and a projected population of 270,330 by December 2023. There were 64 health facilities, including 2 hospitals, of which 1 was a government hospital and 1 was a CDH, 8 health centers (7 government and 1 private), and 57 dispensaries, of which

29 were government-owned, 13 were FBO, and 15 were private. The council had a total of 345 health workers against the 817 required. The availability of health workers was 48.3%, while the shortage of health workers was 52.7%. Among these 345 health workers, 278 (82%) were skilled health workers trained in various health disciplines (Figure 3.1).

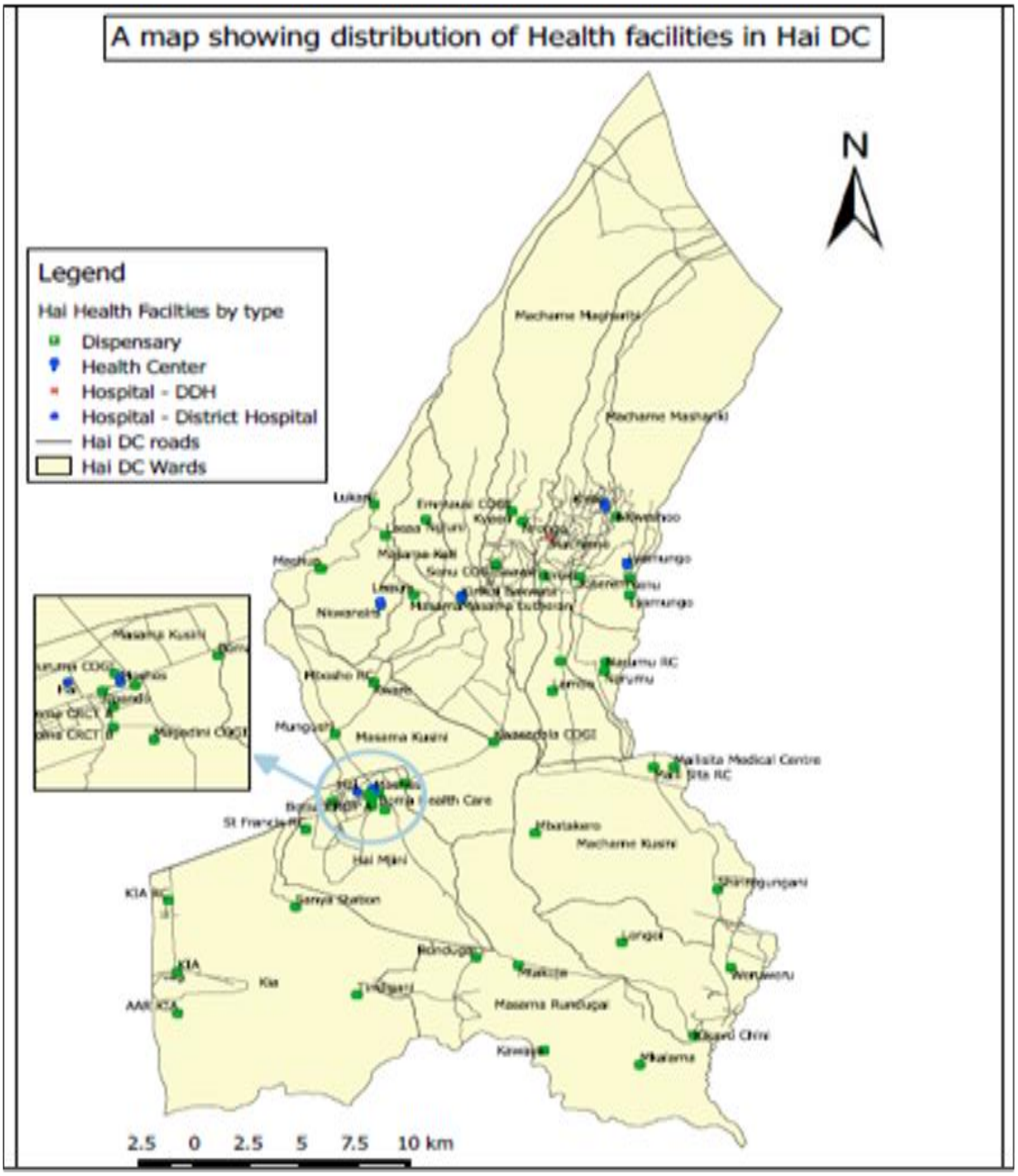

Figure 3.1: Hai District Map showing the Distribution of Different Health Facilities

In 2017, Hai district was involved in a cross-sectional study involving 11 districts randomly selected in 1-2 geographical regions. The study aimed to determine the data quality and usage of the information collected through HMIS at health facilities. In this study, Hai district was among the rural districts with good HMIS performance. Therefore, the study area was purposefully chosen to determine the factors associated with HMIS performance using a standard tool for HIMS performance evaluation.

3.4 Sampling Design and Procedures

The sampling design is a plan that uses evidence-based methods, protocols, and guidelines to guide a research study. Researchers choose the sample design as a methodological decision before they submit it for ethical review and begin collecting data (Majid, et al., 2018). This study aims to evaluate the knowledge, attitudes, and practices (KAP) of healthcare providers at the facility level concerning the use of HMIS data in decision-making to enhance health services in Hai District Council.

3.4.1 Stratified Random Sampling

Stratified random sampling involves dividing the population into distinct groups, or strata, based on specific characteristics. In this study, the population consists of healthcare providers from 61 health facilities in the Hai District. To achieve a representative sample, healthcare facilities were categorized into different strata, including hospitals, health centers, and dispensaries. A stratified random sampling technique was then employed to select participants from each of these groups, ensuring that all types of health facilities were adequately represented in the study.

3.4.2. Simple Random Sampling

After the strata were established, simple random sampling was applied within each

stratum to select healthcare providers. This method ensures that every individual within the strata has an equal chance of being selected, thereby minimizing bias. A total sample of 35 healthcare providers was drawn from 9 selected health facilities using this combined approach. The distribution of respondents included 11 healthcare providers form hospitals, 9 healthcare providers form health centres, and 15 healthcare providers form dispensaries. Figure3.2: Schematic sampling procedure presentation of study facilities and respondents

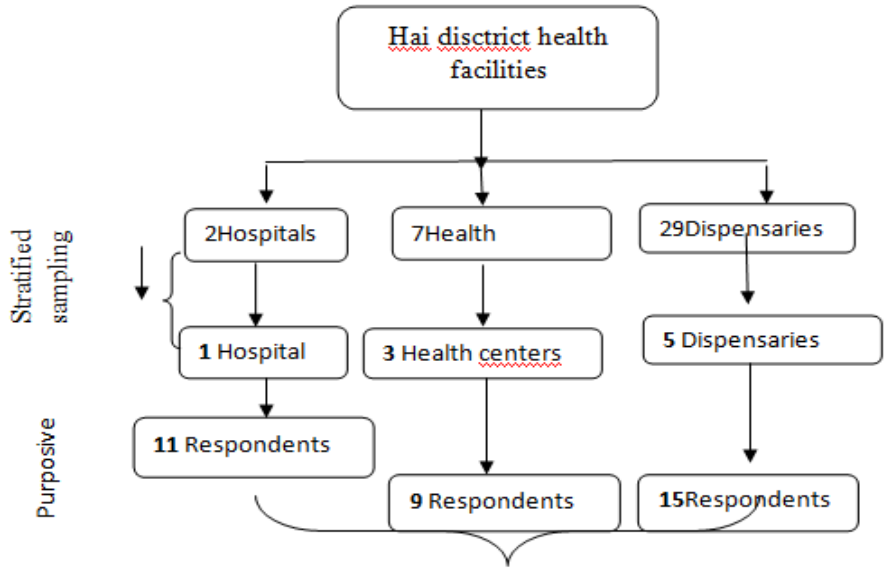

Figure 3.2: Sampling Methods

3.5 Variables and Measurement Procedures

Quantitative data will be collected using adopted questionnaires from the PRISM toolkit that was designed for the evaluation of HMIS performance. Assessment of the technical, behavioral, and organizational factors will be conducted by administering different tools as stipulated by the PRISM framework as follows;

Performance diagnostic tools will be administered to assess the HMIS performance in terms of data quality and use of information. The questionnaire will be administered to selected health facilities in charge to ascertain the level of HMIS

performance. Management assessment tools will be used by reviewing or observing important documents, including an office organogram, HMIS health sector plans and reports, standard operating procedures (SOPs), training plans, manuals, and supervision tools.

A facility checklist will be utilized to assess the availability and condition of resources at health facilities. It will evaluate whether essential equipment, such as computers, printers, backup units, and utilities like electricity, as well as registers and forms, are present. Organizational and behavioral assessment tools will be employed to determine if the necessary structures are established to achieve the desired outcomes in HMIS performance. These tools evaluate the promotion of an information-driven culture and individual behaviors, as well as measure staff performance within the HMIS. In-depth interviews (IDIs) with one selected healthcare worker will be used to collect qualitative data. A structured IDI guide will be administered by trained researchers on qualitative research methods to ensure the quality of the data collected.

3.6 Methods of Data Collection

Quantitative data were collected using adapted questionnaires from the PRISM toolkit, specifically designed for evaluating HMIS performance. The assessment focused on technical, behavioral, and organizational factors, with different tools administered as outlined in the PRISM framework. Healthcare providers were given these questionnaires to complete, allowing for the systematic collection of data. Additionally, the researcher conducted observations using a physical guide to evaluate the tools and processes employed in the HMIS. A structured IDI guide were

administered by trained researchers on qualitative research methods to ensure the quality of the data collected.

3.7 Preliminary Examination of Data

The section outlines the process of screening and cleaning the raw data before analysis. It focuses on addressing two main types of issues: those related to individual data points, such as ensuring the accuracy of data entry, handling missing observations, and identifying and managing outliers (Jassim & Abdulwahid, 2021).

3.7.1 Data Screening

The study made sure that the data were cleaned and prepared before performing additional statistical analyses. This process involved checking the questionnaires, editing the data, and addressing any missing values.

3.7.2 Questionnaire Checking

The researchers used a pre-test and pilot study to evaluate the quality of the questionnaire. The pre-test was conducted to ensure the statements in the questionnaire were clear, concise, focused, and appropriate for the respondents. This pre-testing process helped assess whether the questions were well-formulated and suitable for the target audience (Virgilio, et al, 2022).

3.7.3 Data Editing

Data editing was conducted both in the field and after data collection. Field editing included a careful review of the completed questionnaires. As a result, the process of analyzing the raw survey data began right away to identify any errors. This allowed

for potential corrections to be made after receiving the completed questionnaires from the respondents. The goal was to identify and address any issues with the data before proceeding with the full analysis. During the field checks for minor errors right after collecting the questionnaires, if any questions were found to be improperly completed by the respondents, they were asked to fill them in or make corrections.

In cases where the handwritten responses in the questionnaires were not easily readable, the researchers would reach out to the respective residents and ask them to clarify their answers. This approach ensured the researchers had a clear understanding of what the respondents had written, rather than having to make guesses. This helped maintain the integrity and rationality of the study. Additionally, after the fieldwork was completed, the researchers conducted a central editing process where they reviewed all the questionnaires. Any errors that were identified were corrected accordingly before the coding and data entry phase. This meticulous review and correction of the raw data helped prepare the questionnaires for the subsequent data analysis.

3.7.4 Missing Values

The dataset for this study was complete, with no missing values. Throughout the data collection and entry process, the researchers took care to ensure that all questionnaires were thoroughly reviewed and any incomplete or unclear responses were clarified with the participants. This meticulous approach to data quality control resulted in a complete dataset, with no instances of missing data for any of the variables included in the analysis. Since there were no missing values present in the

dataset, no imputation techniques were required. The analysis was conducted using the full, intact dataset without the need to handle or replace any missing information. This allowed the researchers to proceed with the planned statistical analyses without any concerns about the potential biases or limitations that missing data can introduce.

3.8 Data Analysis

Once the questionnaire is completed by the respondents at health facilities, the collected raw data will be organized systematically to aid in analysis. The researcher checked the data for accuracy and completeness. Following this, the data were entered into the Statistical Package for Social Science (SPSS) for analysis, focusing on generating frequency counts. Descriptive statistics, including frequencies, means, and standard deviations, was computed. The results were then displayed in tables, accompanied by explanations.

For the qualitative data, thematic content analysis was applied to examine the in-depth interviews. The researcher transcribes and translates the interviews into English. They then conducted a manual analysis by creating a code list after reading the transcripts multiple times. This was followed by open coding to identify key themes and sub-themes that arise from the data, which will be connected to the specific objectives of the study.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Overview

This chapter shares the findings and discussions about the factors related to the performance of health management information systems (HMIS) in selected health facilities in Hai district. The presentation and analysis of the data focused on evaluating the factors related to health management information system (HMIS) performance. The results are organized according to the specific research objectives.

Therefore, the findings are organized into the following subsections: technical factors related to health management information system (HMIS) performance; organizational factors influencing HMIS performance; and behavioral factors affecting HMIS performance. Before presenting the findings, the socio-economic characteristics of the respondents are shared to give readers an understanding of the individuals involved in the study.

4.2 Demographic Information

4.2.1 Social Economic Information of the Respondents

In this study results from Table 4.1 shows that the largest age group is 31-40 years old, comprising 36.1% of the respondents. The next largest groups are 41-50 (27.8%) and 21-30 (25.0%), while the smallest group is those over 51 years old at 11.1%. This suggests the respondent pool is relatively weighted towards middle-aged individuals, with relatively fewer younger and older participants represented. In terms of gender, the respondent demographic pool is heavily dominated by females, who make up 80.6% of the respondents. Males account for 16.7%, while a small

percentage (2.8%) did not specify their gender. This significant gender imbalance may limit the generalizability of the study findings if the topic has significant gender differences.

Table 4.1: Demographic Characteristics of the Respondents

Demographics		Frequency	Percent
Age	21-30	9	25.0
	31-40	13	36.1
	41-50	10	27.8
	v. > 51	4	11.1
	Total	36	100.0
Gender	Male	6	16.7
	Female	29	80.6
	8	1	2.8
	Total	36	100.0
Designation	Physician/Clinician	7	19.4
	Nurse, midwife, nurse/midwife	20	55.6
	Medical attendant	4	11.1
	Laboratory personnel	3	8.3
	7	2	5.6
	Total	36	100.0
Years in Service	1-2	5	13.9
	3-4	4	11.1
	5-6	3	8.3
	7 & above	24	66.7
	Total	36	100.0
Your facility type	Available	13	36.1
	Non-Available	10	27.8
	3	13	36.1
	Total	36	100.0

Source: Field Survey, 2024.

Regarding designation, the largest group represented is Nurses/Midwives at 55.6%. Physicians/Clinicians make up 19.4% of the respondents, followed by smaller proportions of Medical attendants (11.1%), Laboratory personnel (8.3%), and other designations (5.6%). This indicates the respondent pool is heavily weighted towards nursing and midwifery staff, with less representation from other healthcare roles. Further, the majority (66.7%) had 7 or more years of service. The remaining participants have 1-2 years (13.9%), 3-4 years (11.1%), and 5-6 years (8.3%) of

experience. This suggests the perspectives collected may be more informed due to the respondents' substantial tenure, but could also introduce potential biases from long-serving staff.

Finally, the facility type of the respondents is somehow balanced, with 36.1% reporting available facilities, 27.8% reporting non-available facilities, and 36.1% not specifying their facility type. This mixed representation of facilities resources could provide insights into how resource availability impacts the study topic, although the large proportion without specified facility type may limit the interpretability of this demographic.

4.2.2 Cross Tabulation between Age and Years in Service Cross Tabulation

Cross-tabulation is a powerful analytical tool that allows researchers to examine the relationship between two or more categorical variables (Dibekulu, 2020). In the context of this study, cross tabulating the respondents' age against their years of service helps to understand the relationship between age and years of service which can inform the development of targeted interventions. Including tailored training programs, mentorship initiatives, or succession planning strategies, to address the specific needs and challenges faced by different cohorts of healthcare professionals.

The cross-tabulation results from Table 4.2 indicate a relatively experienced workforce, with a significant proportion of mid-career and senior-level professionals. The distribution of age and years of service may indicate potential opportunities for knowledge transfer, mentorship, and succession planning within the organization since the cross-tabulation results reveals that the 31-40 age groups has the highest

representation across all years of service categories, indicating a presence of mid-career professionals.

The 41-50 age group and the seven and above years of service category have the same number of respondents (10 each), suggesting a substantial proportion of experienced and senior-level professionals. Furthermore, the 21-30 age group is more evenly distributed across the years of service categories, reflecting a mix of early-career and more experienced individuals within this age range. The over-51 age group has the lowest representation, with most of these respondents having either 1-2 or 7 and above years of service, indicating a smaller proportion of late-career professionals.

Table 4.2: Cross Tabulation between Age and Years in Service

		Number of years in service				Total
		1-2	3-4	5-6	7 & above	
Age in years	21-30	3	2	2	2	9
	31-40	1	1	1	10	13
	41-50	0	0	0	10	10
	> 51	1	1	0	2	4
Total		5	4	3	24	36

Source: Field Survey, 2024.

4.2.3 Cross Tabulation between Designation and Years in Service Cross Tabulation

Cross-tabulation is a powerful analytical tool that allows researchers to examine the relationship between two or more categorical variables (Dibekulu, 2020). Cross-tabulating the respondents' designation (job title or position) with their years of service can reveal the extent to which certain designations are associated with specific years of service, suggesting the types of skills, expertise, and institutional

knowledge that are typically required for different roles.

The cross-tabulation results from Table 4.3 indicate that physicians/clinicians are a more experienced group, with the majority 4 out of 7 having seven or more years of service. Similarly, the largest proportion of Nurses, Midwives, and Nurses/ Midwives, 15 out of 20, have 7 or more years of service, suggesting a relatively experienced nursing workforce. The majority of Medical Attendants, 3 out of 4, also have seven or more years of service, implying a core group of long-serving support staff. The same pattern is observed for Laboratory Personnel, with 2 out of 3 respondents having seven or more years of experience, indicating a stable and experienced laboratory team. The other designations category shows a more even distribution across the years of service groups.

Further, the majority of respondents, 24 out of 35, have 7 or more years of service suggesting an experienced and tenured workforce. The remaining respondents are distributed among the 1-2 years, which had five respondents, 3-4 years, which had four respondents, and 5-6 years, which had three respondents of service categories. This cross-tabulation indicates that the healthcare facility has a core group of experienced personnel, particularly in the Physician/Clinician, Nursing, and Medical Attendant roles. This experienced workforce may possess valuable institutional knowledge and contribute to the overall quality of healthcare services. However, the relatively lower representation in the 1-2 and 3-4 years of service categories suggests potential challenges in staff retention or the need for targeted recruitment and training initiatives to build a pipeline of younger or less experienced personnel.

Table 4.3: Cross Tabulation between Designation and Years in Service

		Number of years in service				Total
		1-2	3-4	5-6	7 & above	
Designation	Physician/Clinician	0	2	1	4	7
	Nurse, midwife, nurse/midwife	3	1	1	15	20
	Medical attendant	1	0	0	3	4
	Laboratory personnel	0	1	0	2	3
		1	0	1	0	2
Total		5	4	3	24	36

Source: Field Survey, 2024.

4.3 Data Analysis

4.3.1 Technical Factors Associated with Health Management Information System (HMIS)

This section of the research objective aims to identify the technical factors associated with health management information system (HMIS) performance among selected health facilities in the Hai district. The data gathered are summarized in Table 4.4. The data in Table 4.4 shows that 100% of the respondents indicated that book 1 (MTUHA/HMIS Guideline) is available for health facilities in Hai District. Further, this indication was obtained to have a mean of 1.00, which suggests that the health facilities in Hai District are well equipped with the necessary HMIS guidelines to support the implementation and use of the health management information system.

Also, book 1 had a standard deviation of 0.00, which means that there is variability in the availability of Book 1 across the health facilities in Hai District. These findings align with the findings by Bogale (2021), who revealed that the overall implementation status of HMIS in South West Shoa Zone hospitals was 58%, with 58% availability and 55% compliance with guidelines. These findings imply that

health facilities in the Hai District have a strong foundation and resource base for HMIS implementation, with universal access to the key HMIS guideline book.

Data reveals that 100% of the respondents indicated that Book 4 Ledger book (pharmacy) is available for health facilities in Hai District. Further, it was revealed that it had a mean of 1.00 with a standard deviation of 0.00 which indicates that there is universal access to this HMIS resource and indicates that there is no variability in the availability of this ledger book across the health facilities in Hai District. These results indicate that health facilities in Hai District are very well equipped with the necessary pharmacy ledger book (Book 4) to support the implementation and use of the Health Management Information System. The findings support what was obtained by Rubona (2022); the Ledger Book has been available in supporting the implementation and use of the Health Management Information System. Hai District is well-positioned to leverage its HMIS infrastructure to improve healthcare service delivery, planning, and decision-making processes.

Data in Table 4.4 reveals that 97.3% of the respondents indicated that book 6. Antenatal care (register, tally sheet & summary form) is available for health facilities in Hai District. Further, the availability of register, tally sheet, and summary form had a mean of 1.03, which indicates that ally sheet and summary form for antenatal care are generally available in the health facilities. Also, the standard deviation of 0.17 indicates that there is relatively low variability in the availability of the antenatal care register, tally sheet, and summary form across the health facilities in Hai District. These results indicate that the antenatal care data collection and reporting system in Hai District is functioning effectively, with the key register, tally

sheet, and summary form resources being available for the majority of health facilities. These results support the study findings by Edison & Timothy (2022), who revealed that the new antenatal management information system in Uganda has made data collection, search, and analysis faster, more convenient, and more efficient. This implies that antenatal care monitoring and evaluation processes have been available for health facilities in Hai District.

Data reveals that 97.2% of the respondents indicated that Book 8. Family planning (register, tally sheet, summary form) has been available for health facilities in Hai District. Further, the availability of book 8 family planning had a mean of 1.03 which suggests that there is a standardized process for ensuring these resources are present and utilized across the district's health facilities. Also, it had a standard deviation of 0.17, which indicates that there is relatively low variability in the availability of family planning documentation materials across the health facilities. Overall, these results indicate that Hai District has established availability and a well-functioning family planning data management system that supports effective program planning, implementation, and evaluation.

These findings are opposite to what was obtained by Moloko & Ramukumba (2022), who indicated that low quality of family planning data has negatively impacted policy development and decision-making, highlighting the need for capacity building and training. These findings imply that family planning data management capacities and systems are available for health facilities in the Hai District. Further, table 4.4 revealed that 97.2% of the respondents indicated that Book 9 diarrhea treatment corner (register, tally sheet, summary form) is available in health facilities in the Hai

district.

Further, the availability of book 9 was indicated to have a mean of 1.11 which indicates that there is a high level of standardization and consistent availability of these diarrhea treatment documentation materials across the district's health facilities. Also, it had a standard deviation of 0.17, which means that there is relatively low variability in the accessibility of the diarrhea treatment documentation materials across the different health facilities. These results indicate that Hai District has established a robust and well-functioning data management system for diarrhea treatment through the availability of Book 9. Implying that Hai District has put in place robust processes and mechanisms to ensure the systematic collection, reporting, and utilization of comprehensive and reliable diarrhea-related data.

Table 4.4 revealed that 88.8% of the respondents indicated that Book 10 Yearly report book (summary form) is available for health facilities in Hai District. The yearbook availability had a mean of 1.06, which means that Book 10: Yearly Report Book (summary form) is consistently and widely available across the majority of the health facilities. Further, through a standard deviation of 0.32, it reinforces that there is a high level of standardization in the provision and use of the Yearly Report Book (Book 10) across the healthcare facilities and a low variability among respondents. This result indicates that the Yearly Report Book (Book 10) is an available and standardized system for health facilities in Hai District.

The data reveals that 94.4% of the respondents indicated that Book 12. Labor and Delivery is available for health facilities in the Hai District. This indicates that the

majority of health facilities in the Hai District (94.4%) have access to and are utilizing Book 12. Labor and Delivery. Further, the availability of book 12. Labor and Delivery had a mean of 1.03 and a standard deviation of 0.23. The mean indicates that on average, the health facilities in the Hai District have very high access to Book 12 Labor and Delivery. Also, the standard deviation of 0.23 means that there is little variability in the availability of this book across the different health facilities. These results align with what was found by Newell et al (2017) that the labour and delivery is available for women in rural Uganda. This indicate that health facilities in the Hai District are well-equipped to support maternal health by providing access to essential resources like Book 12.

These findings imply that Hai District has established an equitable system for distributing and utilizing Book 12. Labor and Delivery across its network of health facilities is a positive indicator of its commitment to strengthening maternal healthcare services and outcomes. Data in Table 4.4 reveals that 97.2% of the respondents indicated that Book 13 Postnatal is available in the health facilities in Hai District. This high percentage suggests that the majority of health facilities in the Hai District have access to and are utilizing this critical resource for postnatal care.

Further, this indication is supported by a mean of 1.03 and a standard deviation of 0.17, which indicates that the health facilities in the Hai District have very high access to Book 13 Postnatal with little variability in the availability of this book across the different health facilities in the Hai District. However, this was quite opposite with the observation by Serbanescu, et al., (2023) who revealed that Postnatal care (PNC) is an underused service in the continuum of care for mothers

with low rate of 15.9%. This indicates that despite the high reported availability of Book 13 Postnatal in the Hai District, there may still be challenges related to the actual utilization of postnatal care services. This implies that Hai District has established a robust and equitable system for distributing and utilizing Book 13 Postnatal across its health facilities, which is a positive indicator of its commitment to strengthening the continuum of maternal and child healthcare services and outcomes.

Data in Table 4.4 shows that 88.9% of the respondents indicated that death forms are available for health facilities in Hai District. This indicates a strong system in place for documenting and reporting deaths occurring within the healthcare facilities in Hai. Further, this indication is supported by a mean of 1.08 and a standard deviation of 0.28, indicating that the high average availability of Death Forms across the health facilities and the relatively low standard deviation suggests there is little variability in the availability of these forms among the different facilities.

Moreover, in Afghanistan it was reported by Maruf (2021) that there are considerable gaps in quality of recordkeeping for maternal deaths in healthcare facilities like underreporting, misclassification, and incompleteness. This indicates that while health facilities in the Hai District demonstrate a strong capacity for documenting and reporting deaths, as evidenced by the high availability of death forms, there may still be underlying issues that could affect the quality of data collected. These results imply that there is available of equitable system available for documenting and reporting deaths within the Hai District healthcare facilities.

Data in Table 4.4 reveals that 91.7% of the respondents indicated that computers and Internet are available in health facilities in Hai. This result suggests a strong technological infrastructure and capacity within the healthcare system in Hai District. Also, the same indication had a mean of 1.14 which indicates that on average, the availability of computers and internet across the health facilities in Hai District is quite high. This further reinforces the interpretation of a strong technological infrastructure. Further, a standard deviation of 0.35 indicates that there is little variability in the availability of computers and the internet among the different health facilities in the Hai District. This point to a fairly consistent and equitable distribution of these technological resources across the healthcare system.

This result is supported by Malembela, et al., (2024), who revealed that effective utilization of ICT healthcare management systems is necessary for the performance of health facilities. These findings imply that Hai District has established a well-integrated technological infrastructure within its healthcare facilities. The data in Table 4.4 reveals that 86.1% of the respondents indicated that printers are available for health facilities in the Hai district. This suggests a strong focus on ensuring that the necessary hardware and tools are available for the healthcare providers and administrative staff.

Also, the same indication had a mean of 1.06, which further reinforces the interpretation of a strong focus on providing the necessary hardware and tools to the healthcare system. A standard deviation of 0.23 suggests that the Hai district has made a concerted effort to ensure that the necessary hardware, such as printers, is widely available and consistently distributed across its healthcare facilities. These

results support what was obtained by Malembela, et al., (2024) who revealed that availability of necessary hardware and software significantly and positively related to the effective utilization of ICT in healthcare management systems at Kilwa Road Police Hospital.

The data in Table 4.4 reveals that 94.4% of the respondents indicated that stationery is available for health facilities in Hai District. These results suggest a very high level of availability of essential office supplies and materials for healthcare providers and administrative staff. Also, the same indication had a mean of 1.03, which indicates that the availability of stationery across the health facilities in Hai District is exceptionally high. This further reinforces the interpretation of a strong focus on providing the necessary office supplies to support the healthcare system. And a standard deviation of 0.17 which indicates that there is minimal variability in the availability of stationeries among the different health facilities in the Hai District.

Further, the results from Table 4.4 portray that 97.2% of the respondents indicated that power supplies (electricity and solar power) are available for health facilities in Hai District. This result suggests an extremely high level of access to reliable power sources across the healthcare facilities in the district. Also, the same indication had a mean of 1.06, which indicates that the availability of power supply (electricity and solar power) across the health facilities in Hai District is quite high. A standard deviation of 0.23 indicates that there is little variability in the power supply availability among the different health facilities in the Hai District.

Data in Table 4.4 reveals that 94.4% of the respondents indicated that notice boards/Data Display Dashboards are available in the health facilities of Hai District.

These results suggest that health facilities in Hai indicated a very strong emphasis on providing visual communication and information display tools within the healthcare facilities. Also, the same indication had a mean of 1.06, reinforcing that the availability of notice boards/data display dashboards across the health facilities in Hai District is high. Further, the standard deviation of 0.17 means that there is minimal variation in the availability of notice boards/data display dashboards among the different health facilities in the Hai District. Findings by Rabiei & Almasi (2022) indicated that use of dashboards have been potential to accelerate data collection, reduce cognitive burden, and reduce errors.

Table 4.4: Availability of Tools and Materials for HMIS/MTUHA Data use at the Facility

	Available		Non-Available			
	f	%	f	%	M	Std
Book 1 (MTUHA/HMIS Guideline)	36	100.0	0	0.0	1.00	0.00
Book 4. Ledger book (pharmacy)	36	100.0	0	0.0	1.00	0.00
Book 5. Outpatient (register, tally sheet & summary form)	35	97.2	1	2.8	1.03	0.17
Book 6. Antenatal care (register, tally sheet & summary form)	35	97.2	1	2.8	1.03	0.17
Book 7. Child health (register, tally sheet & summary form)	36	100.0	0	0.0	1.00	0.00
Book 8. Family planning (register, tally sheet & summary form)	35	97.2	1	2.8	1.03	0.17
Book 9. Diarrhoea treatment corner (register, tally sheet & summary form)	35	97.2	1	2.8	1.11	0.17
Book 10 Yearly report book (summary form)	32	88.9	4	11.1	1.06	0.32
Book 12. Labor and delivery (register, tally sheet & summary form)	34	94.4	2	5.6	1.03	0.23
Book 13 Postnatal (register, tally sheet & summary form)	35	97.2	1	2.8	1.03	0.17
Tracer Medicine Form (summary form)	35	97.2	1	2.8	1.11	0.32
Death Form (summary form)	32	88.9	4	11.1	1.08	0.28
Computer + Internet	33	91.7	3	8.3	1.14	0.35
Printer	31	86.1	5	13.9	1.06	0.23
Stationaries	34	94.4	2	5.6	1.03	0.17
Power supply. (electricity/solar power)	35	97.2	1	2.8	1.06	0.23
Notice boards/Data Display Dashboards	34	94.4	2	5.6	1.06	0.17

Source: Field Survey, (2024).

HMIS Tool uses

The section focuses on assessing the healthcare providers' practices regarding the uses and purposes of the HMIS/MTUHA tools and data uses. Table 4.5 shows that the Pearson chi-square statistic is 8.656 with 2 degrees of freedom. The corresponding p-value is 0.013, which is less than the commonly used significance level of 0.05. This indicates that there is a statistically significant association between the HMIS tools used and the type of facility in Hai District.

The chi-square statistic for the Linear-by-Linear Association is 6.505 with 1 degree of freedom. The p-value is 0.011, which again is less than 0.05. This suggests that there is a significant linear relationship between the HMIS tools used and the types of health facilities. These results of the chi-square test demonstrate a statistically significant association between the variables related to the different uses of the HMIS tools (Register, Tally Sheet, and Client Card) for different health facilities in Hai District.

Table 4.5: Chi-square Test Availability of HMIS/MTUHA Tools and Materials among the Different Facility Types

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.656[a]	2	.013
Likelihood Ratio	9.600	2	.008
Linear-by-Linear Association	6.505	1	.011
N of Valid Cases	35		

a. 3 cells (50.0%) have expected count less than 5.
b. The minimum expected count is 1.14.
Source: Field Survey, (2024).

Assessment of Practice of Health Care Workers in HMIS/MTUHA and Data use

This section aimed to examine healthcare workers' knowledge, attitudes, and behaviours regarding the use of HMIS/MTUHA tools and the application of data for decision-making. Data gathered are summarized in table 4.10 as follows: Data in

Table 4.6 indicates that 97.1% of respondents said yes to the statement that HMIS/MTUHA has the ability to fill a complete register. This data indicates the majority of respondents believe the HMIS/MTUHA system is highly effective at capturing and recording health data in the relevant registers. This means that healthcare workers find the HMIS to be efficient, reliable, and able to meet their data management requirements. This implies that the HMIS/MTUHA is perceived to be comprehensive, user-friendly, and well-integrated with the data entry and record-keeping needs of healthcare providers for health facilities workers in Hai District.

Data indicates that 88.6% of respondents said that HMIS/MTUHA can fill the complete tally sheet. This result suggests that most respondents believe the HMIS/MTUHA system is effective at capturing and recording health data through tally sheets, which are commonly used in healthcare settings to track and monitor various metrics and indicators. The high percentage of respondents who responded yes indicates a positive sentiment towards the capability of the HMIS/MTUHA system to fully document the necessary data on tally sheets for health facilities in Hai District. Further, the study by Lisu, et al., (2024) underscored the importance of accurate and timely health information in guiding decision-making processes and improving healthcare delivery. These findings imply that the HMIS/MTUHA system is generally perceived as a reliable tool for health data management, which is crucial for effective healthcare delivery in the Hai District.

Table 4.6 shows that 97.1% of respondents said yes to that HMIS/MTUHA has the ability to fill out a complete summary form. This result indicates that an overwhelming majority of the respondents believe that the Health Management

Information System (HMIS) or Mfumo wa Taarifa za Afya Tanzania (MTUHA) can completely fill or populate the summary forms used in the healthcare reporting system. The results imply that the HMIS/MTUHA is perceived as an effective tool for ensuring comprehensive data capture and reporting at the summary level. The study by Mboera, et al., (2021) further revealed that inadequate analysis and poor data utilisation practices in Tanzania's health management information system are influenced by inadequate human and financial resources, lack of incentives, supervision, and lack of standard operating procedures.

Data indicates that 91.4% of respondents said yes to the statement that HMIS/MTUHA can fill client cards. This result suggests that the majority of respondents believe the HMIS/MTUHA system is effective in comprehensively capturing and documenting all the necessary client information. This implies that there is a high level of confidence in the system's ability to provide complete and accurate record-keeping for patients and clients served by the healthcare facilities utilizing this information management system. These findings indicate that the HMIS/MTUHA is perceived as a reliable tool for maintaining comprehensive client/patient data, which is a key aspect of effective healthcare service delivery and monitoring.

Data indicates that 82.9% of respondents said that HMIS/MTUHA has the ability to summarize and present data in graphs/charts and tables. The high percentage of responses indicated that the majority of healthcare workers in Hai District feel confident in the HMIS/MTUHA system's ability to support the summarization and visualization of data. This suggests that the system has robust data presentation capabilities, which can help healthcare workers quickly and effectively communicate

trends to decision-makers, stakeholders, and the broader community for health facilities in Hai District.

The data in Table 4.6 reveals that 71.4% of the respondents said yes to the statement that HMIS/MTUHA has the ability to perform Trend Analysis. This indicates that a majority of the healthcare workers surveyed feel they have the capacity to analyze data trends over time using the HMIS/MTUHA system. The relatively high percentage of responses suggests that many healthcare workers are confident in their ability to leverage the HMIS/MTUHA system to conduct this type of analysis for health facilities in Hai District. Lastly, Table 4.6 indicates that 82.4% of respondents said yes to the statement that HMIS/MTUHA can compare present and preview data. This indicates that the majority of healthcare workers reported that HMIS/MTUHA can compare current data with past data. The results suggest that healthcare workers generally feel confident in their skills to review and compare current and historical data from the HMIS/MTUHA system.

Table 4.6: Assessment of Practice of Health Care Workers in HMIS/MTUHA and Data Use

	Yes		No	
	f	%	f	%
Ability to fill completely register	34	97.1%	1	2.9%
Ability to fill completely tally sheet	31	88.6%	4	11.4%
Ability to fill completely summary form	34	97.1%	1	2.9%
Ability to fill completely client cards	32	91.4%	3	8.6%
Ability to summarize & present data in graph/charts, tables	29	82.9%	6	17.1%
Ability to perform Trend Analysis	25	71.4%	10	28.6%
Ability to compare present & previous data	29	82.9%	6	17.1%

Source: Field Survey, (2024).

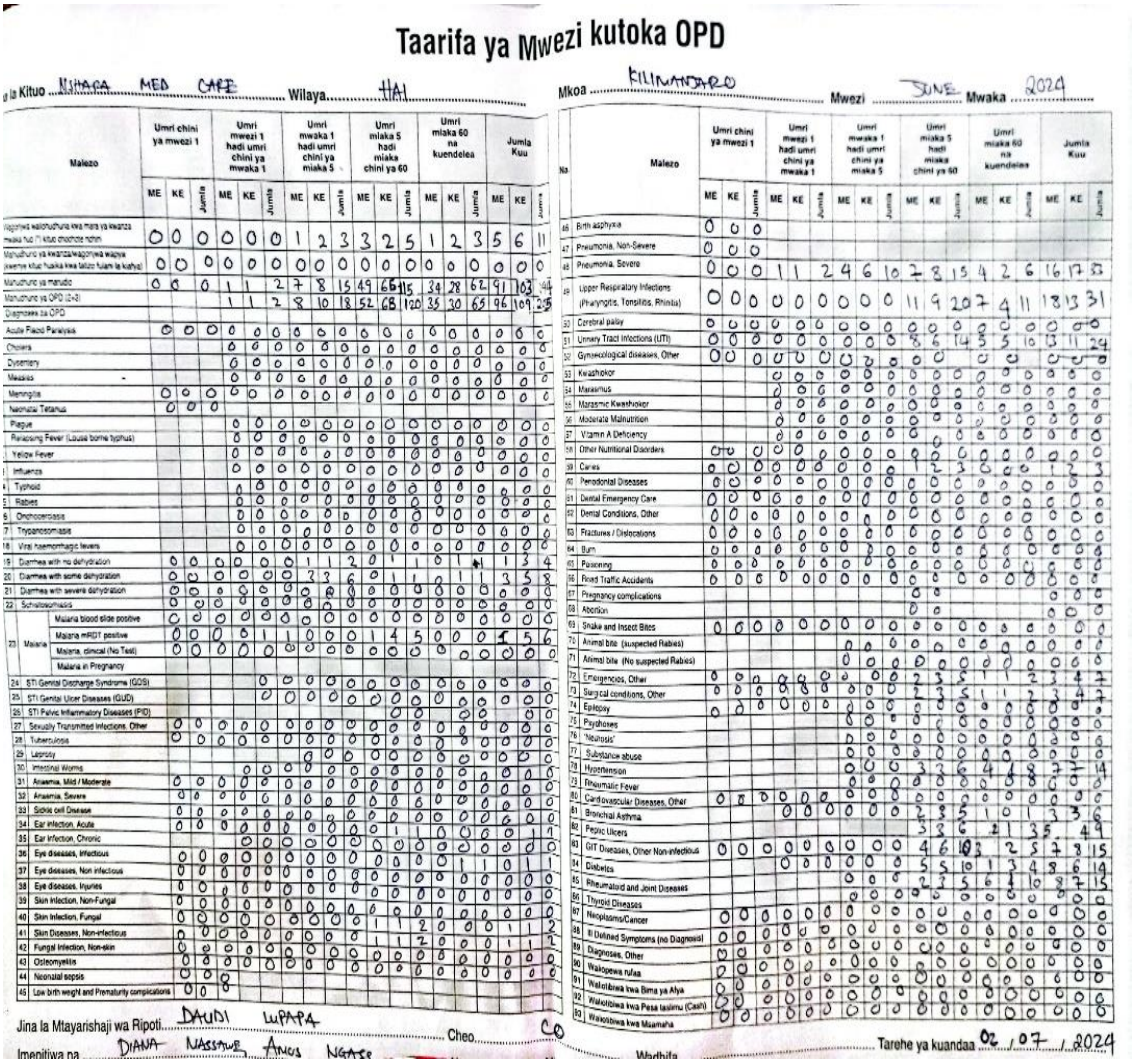

Figure 4.1: Practices of Public Dissemination of Information
Source: Field Data, (2024).

Facility Display Information on Notice Board

This section examined the extent to which healthcare facilities are displaying important health information and updates on their public notice boards. The responses gathered from the healthcare workers among health facilities in Hai District were summarized and presented in Table 4.7 The data in Table 4.7 reveals that 82.9% of respondents indicated yes to the statement that the top 10 diseases at the facility over the previous two quarters, while 17.1% of respondents indicated that facilities do not display this information. This indicates that the majority of the

health facilities are making this important health information visible and accessible on the notice boards for the public and the facility staff. However, a minority of health facilities do not proactively share the top 10 diseases at the facility. These results imply that most health facilities in Hai District are meeting the expectation of displaying the top 10 diseases.

Data shows that 80.0% of respondents indicated that HMIS (Health Management Information System) indicators from the previous two quarters, presented in graphs, charts, or tables, are displayed on the notice board. While 20.0% of respondents indicated that the facilities do not display indicators from the two previous quarters to show performance. These results suggest that the majority of health facilities are actively sharing performance data and trends on key HMIS indicators with the public and facility staff. Displaying this information can help improve transparency, accountability and engagement around healthcare service delivery. Implying that most health facilities in Hai District are meeting the expectation of displaying HMIS performance data.

Figure 4.2: Availability of Notice Boards and Data Display Dashboards within Health Facilities
Source: Field Data, (2024).

Data in Table 4.7 shows that 94.3% of the respondents indicated that the catchment served by the facility are displayed on the notice bored, while 5.7% of the respondents indicated that catchment served by the facility are not displayed. This results suggests that the majority of health facilities are transparently sharing information about the geographic area and population they are responsible for serving. Overall, the findings imply that the majority of health facilities in Hai District are meeting the expectation of displaying the catchment population information, which is a positive indicator of transparency and community engagement.

Data reveal portrays that 82.9% of the respondents indicated that allocation of medicines and supplies are displayed on the notice body of health facilities. While 17.1% of the respondents indicated that the health facilities do not display the allocation of medicines and supplies on the notice boards. This results suggests that most facilities are prioritizing transparency in how they manage and distribute essential medicines and supplies. However, some of facilities are not sharing allocation of medicines and supplies. These findings imply that it is importance for health facilities in Hai District to maintain transparent and accessible communication about their operational practices, particularly when it comes to the distribution of critical medical supplies.

Lastly, the data in Table 4.7 shows that 88.6% of the respondents indicated that revenue collection, received funds and expenditures are displayed on the facilities notice boards, while the remaining 11.4% of the respondents indicated that the revenue collection, received funds and expenditures are not displayed on the facilities notice boards. The high percentage suggests that most facilities are

prioritizing transparency around their financial management and resource utilization.

Table 4.7: Facility Display the following Information on Notice Board

	Yes		No	
	f	%	f	%
The leading Top 10 Diseases at your facility from the previous two quarters	29	82.9%	6	17.1%
Displayed information (Graph, charts or tables) on any HMIS indicators from the previous two quarters to show performance or trend.	28	80.0%	7	20.0%
Catchment population served by the facility	33	94.3%	2	5.7%
Allocation of medicines & Supplies	29	82.9%	6	17.1%
Revenue collection, received funds and expenditure	31	88.6%	4	11.4%

Source: Field Survey, (2024).

A relatively small percentage does not publicly share revenue collection, received funds, and expenditures. These findings imply that consistently displaying details about revenue, funding, and expenditures of health facilities in the Hai District enhances public trust, promotes accountability, and enables better-informed community engagement.

4.3.2 Organizational Factors Associated with Health Management Information System (HMIS) Performance

This section examines the attitude of health care providers on the HMIS/MTUHA and their data use practices within health facilities in Hai district. The data gathered are summarized as explained through the chi-square tests. The chi-square test in Table 4.8 was conducted to examine the association between the healthcare providers' attitudes and their demographic genders. The Pearson chi-square statistic of 5.729 with 6 degrees of freedom and the associated p-value of 0.454 indicates that there is no statistically significant association between the healthcare providers' attitudes and their gender. In other words, the attitudes towards the health

management information system (HMIS) and data use do not appear to differ significantly between male and female healthcare providers.

Further, the Likelihood Ratio chi-square test and the Linear-by-Linear Association test corroborate this finding, with p-values of 0.424 and 0.293, respectively. They suggest that healthcare providers' attitudes are independent of their gender. However, table 4.8 footnote highlights that 75% of the cells have an expected count of less than 5, which violates the assumptions of the chi-square test. However, overall, the chi-square test results suggest that there is no statistically significant association between healthcare providers' attitudes towards HMIS/MTUHA and data use and the genders of the respondents.

Table 4.8: Chi-Square Test between Attitude Responses and the Demographic Variables

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.729[a]	6	.454
Likelihood Ratio	5.989	6	.424
Linear-by-Linear Association	1.104	1	.293
N of Valid Cases	36		

a. 9 cells (75.0%) have expected count less than 5.
b. The minimum expected count is .11.

Source: Field Survey, (2024).

4.3.3 Behavioral Factors Associated with Health Management Information System (HMIS) Performance

This section of the research objective one which aims at identifying the knowledge on factors associated with health management information system (HMIS) performance among selected health facilities in Hai district. The data gathered are summarized in Table 4.9, Table 4.10 and Table 4.11.

Knowledge of HMIS/MTUHA and Data Use

Table 4.9 indicates that there are six males and 29 females in the sample. The mean knowledge score for males is 5214.17, and the mean knowledge score for females is 6604.00, suggesting that females scored higher on the knowledge assessment than males. Further, the standard deviation of the male knowledge score is 6071.97, and the standard deviation of the female is 6498.61. These results indicate that there is much variability in the knowledge scores for both genders. Also, males had a standard error mean of 2478.87, and females had a standard error mean of 1206.76, indicating that the mean estimates are less precise for the male group due to the smaller sample size.

Table 4.9: Knowledge Score of the Respondents

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Knowledge Score	Male	6	5214.1667	6071.97228	2478.87230
	Female	29	6604.0000	6498.60956	1206.76150

Source: Field Survey, 2024.

Further, interpret these results, additional statistical analysis, such as a t-test, has been used to determine if the difference in mean knowledge scores between males and females is statistically significant in Table 4.10. Table 4.10 presents the results of an independent samples t-test, which was used to compare the mean Knowledge Score between two groups, presumably males and females. Levene's test has a p-value of 0.021, which is less than the commonly used significance level of 0.05. This indicates that the assumption of equal variances between the two groups is violated.

Further, the t-statistic shows that p-values for the tests are 0.633 and 0.629, respectively, for males and females, both of which are greater than the commonly used significance level of 0.05. This suggests that the difference in mean Knowledge Score between the two groups is not statistically significant. Overall, the results suggest that the difference in mean Knowledge Score between the males and females is not statistically significant, even though the mean score for females appears to be higher than the mean score for males.

Table 4.10: Independent Samples Test

		Levene's Test		t-test for Equality of Means						
		F	Sig.	t	df	Sig	Mean D	Std. Error D	95% Confidence Interval	
									Lower	Upper
Knowledge Score	Equal variances assumed	5.90	.02	-.48	33	.63	-1389.83	2886.43	-7262.32	4482.65
	Equal variances not assumed			-.50	7.57	.63	-1389.83	2757.00	-7810.16	5030.49

Source: Field Survey, (2024).

Table 4.10 shows the independent sample effect size; it reveals that Cohen's d-point estimate of the effect size is -0.216, with a 95% confidence interval ranging from -1.095 to 0.666. This suggests a small to medium-sized effect, with the mean Knowledge Score for one group being approximately 0.216 standard deviations lower than the other group. Further, the Hedges' correction effect size, which accounts for small sample bias, has a point estimate of -0.211 with a 95% confidence interval of -1.070 to 0.651, indicating also a small to medium-sized effect.

The Glass's delta effect size, which uses the standard deviation of the control group as the standardizer, has a point estimate of -0.214 with a 95% confidence interval of -1.093 to 0.669. This is also consistent with the Cohen's d and Hedges' correction results, further confirming the small to medium-sized effect. These results are

suggesting that the difference in Knowledge Score between male and female is not statistically significant. This is consistent with the results drawn from the independent samples t-test results.

Table 4.11: Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Knowledge Score	Cohen's d	6435.78	-.216	-1.09	.67
	Hedges' correction	6586.82	-.211	-1.07	.65
	Glass's delta	6498.61	-.214	-1.09	.67

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.
Source: Field Survey, 2024.

CHAPTER FIVE

SUMMARY OF THE FINDINGS

5.1 Introduction

This chapter presents a discussion of the key findings regarding the factors associated with the performance of the Health Management Information System (HMIS) in selected health facilities within the Hai district. The discussions are structured around the specific research objectives, providing a detailed analysis of the technical factors, organizational factors, and behavioral factors that influence HMIS performance.

5.2 Summary of the Study

This study assessed the factors associated with health management information system (HMIS) performance among selected health facilities in Hai district. The first objective of this study was to identify technical factors associated with HMIS performance among selected health facilities in Hai district. The second objective was to identify organizational factors associated with HMIS. The third objective to investigate behavioral factors associated with HMIS performance among selected health facilities in Hai district. Therefore, this chapter is going to present summary of the findings that was observed from the results with respect to the research questions for this study.

5.3 Demographic Characteristics of the Respondents

Basing on the demographic results, it is revealed that respondent pool is relatively weighted towards middle-aged healthcare workers, with fewer younger and older participants represented. The respondents are mostly female, which limits the

generalizability of the findings if the topic under investigation has significant gender differences. The designation of the respondents is heavily tilted towards Nurses/Midwives, with smaller representations from Physicians/Clinicians, Medical attendants, Laboratory personnel, and other designations. This demographic composition suggests that the perspectives collected are more reflective of the nursing and midwifery staff. In terms of years of service, the majority of the respondents have 7 or more years of experience, indicating that the collected perspectives were informed by substantial occupation. Finally, the facility type of the respondents is balanced, with reporting available facilities, reporting non-available facilities, and some who did not specify their facility type.

5.4 Technical Factors Associated with Health Management Information System (HMIS)

The objective was to identify technical factors associated with health management information system (HMIS) performance among selected health facilities in Hai district. Discussions of these findings are summarized for this section. Based on the results of the majority of health facilities have access to and are utilizing critical HMIS documentation materials such as the MTUHA/HMIS Guideline Book, Pharmacy Ledger Book, Antenatal Care documentation, Family Planning documentation, Diarrhoea Treatment documentation, and Yearly Report Book. This indicates a strong foundation for HMIS implementation.

The health facilities also have very high access to and utilization of documentation materials for labor and delivery (Book 12) and postnatal care (Book 13), suggesting a strong and equitable system for maternal and child healthcare service delivery,

planning, and reporting. Additionally, the majority of health facilities have access to death-reporting forms, indicating a well-functioning system for documenting and reporting deaths within the healthcare facilities.

The healthcare facilities in Hai District have a strong technological infrastructure, with high availability of computers, internet, printers, and other essential office supplies and equipment, implying a well-integrated technological capacity within the healthcare system. The health facilities also have access to reliable power sources, including electricity and solar power, with minimal variability across the different facilities, suggesting a robust and equitable power supply system supporting the healthcare operations. Lastly, the majority of health facilities have access to notice boards and data display dashboards, indicating a strong emphasis on visual communication and information sharing within the healthcare system.

Based on the HMIS tool uses, it was revealed that the chi-square test indicates a statistically significant association between the HMIS tool uses and the type of facility in Hai District. Specifically, the Pearson chi-square statistic and the Linear-by-Linear Association statistic both demonstrate a significant relationship between the variables related to the different uses of the HMIS tools, like Registers, Tally Sheets, and Client Cards, and the types of health facilities in the district. These results suggest that the utilization of the HMIS tools and the purposes for which they are used vary across different types of healthcare facilities in Hai District. The significant linear relationship between the HMIS tools uses and the facility types imply that the practices and the application of the HMIS tools are not uniform across the healthcare system, but are influenced by the specific characteristics and needs of

the different types of facilities.

Regarding the assessment of the practice of health care workers in HMIS/MTUHA and data usage, it was revealed that the majority of respondents believed the HMIS/MTUHA system is highly effective in capturing and recording health data, including the ability to fill registers, tally sheets, summary forms, and client cards, suggesting the system is comprehensive, user-friendly, and well-integrated with the data management needs of healthcare providers. Healthcare workers feel confident in the HMIS/MTUHA system's ability to support the summarization and visualization of data through graphs, charts, and tables, indicating robust data presentation capabilities.

The majority of healthcare workers feel confident in their skills to review and compare current and historical data from the HMIS/MTUHA system, enabling them to track progress and identify trends. Most health facilities display important information on their public notice boards, including the top 10 diseases, HMIS indicators, catchment population, allocation of medicines and supplies, revenue collection, received funds, and expenditures, indicating a commitment to transparency and community engagement. Overall, the assessment highlights the perceived effectiveness and utility of the HMIS/MTUHA system among healthcare workers in Hai District, as well as the general adherence to best practices regarding data management, analysis, and public dissemination of information.

5.5 Organizational Factors Associated with Health Management Information System (HMIS) Performance

The objective was to identify organizational factors associated with health management information system (HMIS) performance among selected health

facilities in Hai district. Discussion of these findings is summarized in this section. Based on the results of the organizational factors associated with HMIS, it was revealed that there was no statistically significant association between the attitudes of healthcare providers towards the HMIS/MTUHA system and data use and their gender. This suggests that the attitudes and perceptions of the organization system's effectiveness and utility are not influenced by the gender of the healthcare workers.

The chi-square test results indicate that the healthcare providers' attitudes are independent of their gender, with the Pearson chi-square, Likelihood Ratio chi-square, and Linear-by-Linear Association tests all showing no significant association. Overall, the findings highlight that organizational factors, such as gender, do not appear to be significantly associated with the performance and utilization of the HMIS/MTUHA system among the healthcare workers in Hai District. This suggests that the system is perceived as effective and useful regardless of the gender of the healthcare providers.

5.6 Behavioral Factors Associated with Health Management Information System (HMIS) Performance

The objective was to investigate the behavioral factors associated with health management information system (HMIS) performance among selected health facilities in Hai district. Discussions of these findings are summarized for this section. The analysis examined the differences in HMIS/MTUHA knowledge scores between male and female respondents. Based on the behavioral factors associated with HMIS, the results indicated that, on average, female participants had higher knowledge scores compared to males.

Specifically, the mean knowledge score for females was 6604.00, while the mean for males was 5214.17. Implying that the difference in mean knowledge scores between males and females was not statistically significant. Further, the independent samples t-test showed p-values greater than the significance level of 0.05, indicating that the observed difference could have occurred by chance. Further, Cohen's d, Hedges' correction, and Glass's delta suggested a small to medium-sized effect, with the mean knowledge score for one group being approximately 0.2 standard deviations lower than the other group. These findings suggest that the difference in Knowledge scores between males and females is not statistically significant.

The results show a high variability in individual knowledge scores, as indicated by the large standard deviations (6498.61 for females and 6071.97 for males). This further suggests that the gender differences in HMIS/MTUHA were not found to be substantial within the sample. The smaller sample size for males also resulted in less precise mean estimates, as indicated by the higher standard error.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the overall conclusions drawn from the research findings on the factors associated with the performance of the Health Management Information System (HMIS) in the selected health facilities of Hai district. The chapter also outlines key recommendations based on the study's conclusions.

6.2 Conclusions

6.2.1 Technical Factors Associated with Health Management Information System (HMIS)

Based on the findings, the study concluded that technical factors are associated with the performance of HMIS within health facilities in Hai District. There is a statistically significant association between the HMIS technical tools used and the type of facility in the district. Further, it was concluded that HMIS is a well-established system for data management and reporting. It was concluded that the healthcare facilities in Hai District have a high availability of computers, internet, printers, and other essential office supplies and equipment.

Regarding access to reliable power sources, including electricity and solar power, it is concluded that health facilities in Hai District are equitable with power supply systems that support healthcare operations. Furthermore, it is concluded that the HMIS/MTUHA system is effective among the healthcare workers in the Hai District. Additionally, the HMIS is user-friendly and well-integrated with the data management needs of healthcare providers within Hai District.

6.2.2 Organizational Factors Associated with Health Management Information System (HMIS)

Based on the findings, the study concluded that organization factors are associated with the performance of HMIS within health facilities in Hai District. The study also concluded that organizational factors are significantly associated with HMIS/MTUHA system performance among the healthcare workers in Hai District. It was further concluded that attitudes and perceptions of the organization system's effectiveness and utility are not influenced by the elements of the healthcare workers.

Furthermore, it was concluded that the HMIS/MTUHA system is well-integrated and accessible to healthcare workers in the health facilities of Hai District. Lastly, Hai District health facilities have a well-designed and inclusive organizational environment supporting the effective implementation and use of the health information management system (HMIS).

6.2.3 Behavioral Factors Associated with Health Management Information System (HMIS)

Based on the findings, the study concluded that behavioral factors associated with HMIS performance do not appear to be considerable factors influencing healthcare workers in Hai District. It can be further concluded that users' knowledge of HMIS performance is not statistically significant among the healthcare workers within health facilities in Hai District. Also, it is concluded that there is considerable variability in users' knowledge of the behavioral factors associated with HMIS performance in Hai District.

6.3 Recommendations

Based on the conclusions, the study recommends the following:-

6.3.1 Recommendation for Policymakers

Policymakers should ensure that health facilities in Hai district are equipped with up-to-date technology to improve the performance of the HMIS. Further, policymakers are obliged to improve power reliability that will help avoid disruptions in HMIS operations, like backup generators or solar panels. Additionally, policymakers should prioritize training initiatives for healthcare workers in Hai district to accommodate varying levels of technical expertise.

6.3.2 Recommendation for Health Facilities in Hai District

Health facilities in Hai district need to take a proactive approach to optimizing their HMIS. They should establish routine checks and maintenance schedules for their systems to prevent technical issues that could hinder the system's performance.

6.3.3 Recommendation for Healthcare Workers in Hai District

Healthcare workers should take an active role in mastering their knowledge of HMIS to enhance its effective performance. Also, healthcare workers in Hai district should use available technical support to resolve any issues they encounter with HMIS. Furthermore, healthcare workers are recommended to provide feedback regarding any challenges or suggestions they have regarding HMIS so as to improve the system's performance.

6.3.4 Recommendation for Health Administrators in Hai District

Health administrators should facilitate access to training and technical support for

healthcare workers in the Hai district to ensure that the system is used efficiently. Administrators need to monitor how well the HMIS is integrated into the organizational workflow and address any barriers to its use. Further, health administrators are recommended to create a positive environment for users (health care) workers to encourage effective use of the HMIS within the district.

6.3.5 Recommendation for Further Studies

Also, this study recommends an area for further research, namely investigating how organizational cultures influence the adoption and use of HMIS for health facilities in Tanzania. This study will contribute to the broader knowledge base and help to guide future efforts to strengthen the effective implementation and use of health information management systems (HMIS).

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APPENDICES

APPENDIX 1: RESEARCH WORK PLAN AND BUDGET

WORK PLAN

Research activities	Time/Months																								Budget (TZS)
	March, 2024				April, 2024				May, 2024				June,2024				July, 2024				August, 2024				
	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	
Proposal development																									-
Development of data collection tools																									-
Data collection																									-
Data analysis																									-
Report writing																									-
Draft Report submission																									-
Final report submission																									-
TOTAL																									**1,870,000**

APPENDIX II: ESTIMATED RESEARCH BUDGET

Participants	Quantity	Justification	Number Of Days	Rate Per Day	Total
Printing and photo copy	1	Data collection tools	1	200,000	200,000.00
Transport	1	Fuel/l	30	3,400	102,000.00
DMO	1	District medical officer incharge	2	10,000.00	20,000.00
DHIS2 Coordinator	1	District data focal person	10	10,000.00	100,000.00
Ffacility charge	5	Data supervisor at the facility level	5	10,000.00	250,000.00
Health workers	15	Facility data aggregator	10	10,000.00	1,500,000.00
GRAND TOTAL					**1,870,000.00**

APPENDIX III: QUESTIONNAIRE

Dear respondent

This questionnaire is to collect data for a study of Technical, Organizational and Behavioral factor towards Health Information Management System (HMIS) data use at facility level among health care providers in Hai district council. Please answer the questions to enable me successfully complete the project. Every information volunteered will be purely for academic purpose and shall be strictly confidential.

Thanks for your cooperation.

Section A: Demographic information of respondents.

Please tick (√) on the appropriate box.

1. Age in years:
   - i. <20 ☐
   - ii. 21-30 ☐
   - iii. 31-40 ☐
   - iv. 41-50 ☐
   - v. > 51 ☐
2. Gender:
   - i. Male ☐
   - ii. Female ☐
3. Your Designation:
   - i. Physician/Clinician ☐
   - ii. Nurse, midwife, nurse/midwife ☐
   - iii. Medical attendant ☐

iv. Pharmacist/druggist ☐

v. Laboratory personnel ☐

vi. Health Officer/environmental health officer ☐

vii. Social welfare officer ☐

viii. Others ☐

4. Number of years in service (in years):

i. ½ - 1 ☐

ii. 1-2 ☐

iii. 3-4 ☐

iv. 5-6 ☐

v. 7 & above ☐

5. Your facility type:

i. Hospital ☐

ii. Health Center ☐

iii. Dispensary ☐

iv. Maternity homes/primate ☐

Section B: Availability of tools and materials for HMIS/MTUHA data use at the facility

Please tick (√) which material/tool that is available in your facility for HMIS data use

Tick as much as are available.

Sn	Materials/Tools for HMIS/MTUHA Data Use	Available	Non-Available
1	Book 1 (Mtuha/HMIS Guideline)		
2	Book 4. Ledger book (pharmacy)		
3	Book 5. Outpatient (register, tally sheet & summary form)		
4	Book 6. Antenatal care (register, tally sheet & summary form)		
5	Book 7. Child health (register, tally sheet & summary form)		
6	Book 8. Family planning (register, tally sheet & summary form)		
7	Book 9. Diarrhoea treatment corner (register, tally sheet & summary form)		
8	Book 10 Yearly report book (summary form)		
9	Book 12. Labour and delivery (register, tally sheet & summary form)		
10	Book 13 Postnatal (register, tally sheet & summary form)		
11	Tracer Medicine Form (summary form)		
12	Death Form (summary form)		
13	Computer + Internet		
14	Printer		
15	Stationaries		
16	Power supply. (electricity/solar power)		
17	Notice boards/Data Display Dashboards		

Section C: Knowledge on HMIS/MTUHA and Data use

Question K 1. The meaning of HMIS/MTUHA

a) Do you agree that the meaning of HMIS is "the system designed to collect facility-based health and health related data, compile, store and retrieve for data analysis to produce report which in turn inform service providers, health managers, decision markers/policy makers and the public to make informed decision on health planning, monitoring and evaluation?" (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

b) Do you agree that HMIS in Tanzania in Kiswahili is called MTUHA which is the acronym for 'Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya'? (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

Question K 2. Reports generated by HMIS/MTUHA

What type of report does the HMIS designed to generate? (*You can tick (√) more than one answer/box*)

i. ☐ Monthly reports

ii. ☐ Quarterly reports

iii. ☐ Yearly reports,

iv. ☐ Weekly IDSR reports

Question K 3. HMIS/MTUHA Tools

How many sets of Tools does HMIS/MTUHA has which are used in health

facilities? (*Please tick (√) the appropriate box*)

i. Five ☐

ii. Four ☐

iii. Three ☐

iv. Two ☐

v. One ☐

Question K 4. HMIS/MTUHA books

How many books are in HMIS/MTUHA? (*Please tick (√) the appropriate box*)

i. Twelve (12) ☐

ii. Ten (10) ☐

iii. Eight (8) ☐

iv. Six (6) ☐

v. Four (4) ☐

Question K 5. HMIS/MTUHA Data Uses

At your facility level, HMIS/MTUHA data are needed to: (*You can tick (√) more than one answer/box*)

i. Plan and develop interventions ☐

ii. Identify clients in need of services and/or referrals ☐

iii. Inventory resources to determine what to order and when ☐

iv. Monitor and evaluate quality of care ☐

v. Improve efficiency through administrative organisation ☐

Question K 6. HMIS/MTUHA Data use core competencies:

Do you know how to analyze, interpretate, synthesize and present the data you

generate on your daily service provision? (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

Question K 7. Training on the data recording and analysis

a) Did you receive training on the data recording and reporting tools? (This can be either formal training from MoHCDGEC or IP, OR on-the-job training). (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

b) Did you receive training on the data analysis, interpretation and presentation? (This can be either formal training from MoHCDGEC or IP, OR on-the-job training). (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

Section D: Attitude on HMIS/MTUHA and data use at the facility level among health care providers

Question A 1. Using HMIS/MTUHA at facility

Perceived benefits of HMIS/MTUHA

Do you think using HMIS/MTUHA at your facility in recording your client's detail is waste of time? (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

Perceived barriers of HMIS/MTUHA

Do you think recording clients details in tally sheet, register book and summary form

is difficult task? (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

Question A 2. HMIS/MTUHA data ownership

Do you think the data you produce at your facility is owned by who? (*Please tick (√) the appropriate box*)

i. Facility level ☐

ii. District level ☐

iii. Regional level ☐

iv. National level ☐

Question A 3. HMIS/MTUHA data use

Do you think is important to use data to Plan and develop interventions at your facility? (*Please tick (√) the appropriate box*)

i. Yes ☐

ii. No ☐

Question A 4. Responsibility of HMIS/MTUHA data analysis

Whom do you think is responsible for HMIS/MTUHA data analysis, interpretation and presentation? (*Please tick (√) the appropriate box*)

i. Staffs at your facility ☐

ii. Coordinators at district level ☐

Section E. Practices

Question P 1. HMIS tool uses

Did you use the following tools in the last three days during service provision?

Please tick (√) the appropriate box)

Sn	Tool	Yes	No
1	Register		
2	Tally sheet		
3	Client cards		

Question P 2. Assessment of Practice of health care workers in HMIS/MTUHA and data use

Please tick (√) as appropriate

Sn	Assessment on Practice (at your service provision point)	Yes	No
1	Ability to fill completely register		
2	Ability to fill completely tally sheet		
3	Ability to fill completely summary form		
4	Ability to fill completely client cards		
5	Ability to summarize & present data in graph/charts, tables		
6	Ability to perform Trend Analysis		
7	Ability to compare present & previous data		

Question P 3. Practice on HMIS/MTUHA Data use

c) Are data used at facility meetings for planning and decision making?

i. Yes ☐

ii. No ☐

d) Did your facility display the following information on notice board? *Please tick (√) the appropriate box*)

Sn	Information displayed	Yes	No
1	The leading Top 10 Diseases at your facility from the previous two quarters		
2	Displayed information (Graph, charts or tables) on any HMIS indicators from the previous two quarters to show performance or trend.		
3	Catchment population served by the facility		
4	Allocation of medicines & Supplies		
5	Revenue collection, received funds and expenditure		

Question P 4. Organization support on HMIS/MTUHA Data Use

a) Is there a designated staff at your facility (e.g., facility in-charge) who is responsible for reviewing aggregated numbers prior to submission to the council level?

i. Yes ☐

ii. No ☐

b) Does your facility support data analysis and use?

i. Yes ☐

ii. No ☐

…..…….

Appendix iv: Clearance Letter

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/PG201986266 **18th June, 2024**

District Executive Director,

Hai District Council,

P.O Box 29,

KILIMANJARO.

Dear Director,

RE: RESEARCH CLEARANCE FOR MR. FAUSTINE MFUNGO PAMBA REG NO: PG201986266

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. Faustine Mfungo**

Pamba Reg.No: PG201986266), pursuing **Masters of Arts in Monitoring and Evaluation (MAME).** We here by grant this clearance to conduct a research titled **"Factors Associated with Performance of Health Management Information System among Selected Health Facilities in Hai District, Tanzania.** He will collect his data at your area from 19th June to 30th July 2024.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof.Gwahula Raphael Kimamala

For: VICE CHANCELLOR

JAMHURI YA MUUNGANO WA TANZANIA

OFISI YA RAIS
TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA WILAYA YA HAI
(Barua zote zitumwe kwa Mkurugenzi Mtendaji)

MKOA WA KILIMANJARO
Simu : 27-29 74369
Fax : 27- 29 74368
Email: ded@haidc.go.tz

Ofisi ya Mkurugenzi Mtendaji,
Halmashauri ya Wilaya Hai,
3BR-TTCL-Kanisani,
25382. Bomang'ombe,
S.L.P. 27,
HAI KILIMANJARO

Kumb. Na.LG/S.20/13/55

23/06/2024

Mganga Mafawidhi
HospitaliKituo cha Afya/Zahanati
.....

YAH: UTAMBULISHO WA MTAFITI FAUSTINE MFUNGO KUTOKA CHUO KIKUU HURIA

Rejea mada tajwa hapo juu

2. Ofisi ya Mkurugenzi Mtendaji Halmashauri ya Wilaya ya Hai ilipokea barua kutoka chuo kikuu Huria ya tarehe 18/06/2024 yenye Kumb Na OUT/PG201986266 yenye mada tajwa hapo juu.

3. Kwa barua hii ofisi ya Mkurugenzi Mtendaji inamtambulisha mtafiti huyo kufanya utafiti huo unaohusu"***Factor Associated With Performance Of Health Management Information System Among Selected Health Facilities In Hai District,Tanzania***." utafiti huo utaanza kuanzia tarehe 19 Juni hadi 30 Julai 2024.

4. Kwa barua hii namtambulisha kwako mtafiti huyo umpokee na kumpa ushirikiano ili aweze kufanikisha utafiti huo.

4. Nashukuru kwa ushirikiano wako.

Dkt: Itikija I. Msuya
Kny: MKURUGENZI MTENDAJI
HALMASHAURI (W),
HAI

Kny. MKURUGENZI MTENDAJI (W)
HAI

Nakala:
Mtendaji wa Kijiji - kwa taarifa