

**Factors influencing health workers capacity to analyse and use malaria data: a case  
of uvinza district in kigoma region, tanzania**

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**MSc(Project Management,Monitoring,&Evaluation in Health)Dissertation  
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**Factors influencing health workers capacity to analyse and use malaria data: a case of uvinza district in kigoma region, tanzania**

**By**

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**A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree of Master of Science (Project Management, Monitoring, and Evaluation in Health) of**

**Muhimbili University of Health and Allied Sciences  
October, 2021**

**CERTIFICATION**

The undersigned certifies that he has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences dissertation entitled “**Factors influencing health workers capacity to analyse and use malaria data: a case of Uvinza district in Kigoma region, Tanzania**”, in (partial) fulfilment of the requirements for the Degree of Master Science (Project Management, Monitoring, and Evaluation in Health) of the Muhimbili University of Health and Allied Sciences.

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Supervisor

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**DECLARATION**

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## **DEDICATION**

To God, who makes me “hero” from “zero” for everything I desired to do in my life. You are my everything, and without you, God, my life would fall apart.

Finally, this dissertation is dedicated to my late father for his endless love, support, and encouragement. His statement, "Sky is not a limit for you", drives my enthusiasm to complete this work. Father, I believe this achievement will complete the dream you had for me many years ago when you chose to give me the best education you could.

## **ABSTRACT**

**Introduction:** The use of data is essential in decision making and holding people accountable. There has been an increase in demand for data use in health programmes. Thus, human and financial resources have been highly invested in supporting data use. However, adequate data use has remained elusive and a subject of continuous research.

**Objectives:** The general objective of this study was to assess the factors influencing health workers' capacity to analyse and use malaria data to make informed decisions in the Uvinza district.

**Material and Methods:** A descriptive cross-sectional design was used to assess the factors influencing health workers capacity to analyse and use malaria data. A high malaria prevalence rate was used to choose Uvinza DC, whereby nine health facilities were randomly selected. Also, 37 healthcare workers and 3 members of CHMT who have been working on malaria programs or interventions were purposively selected. Data were gathered by in-depth interviews, documentary review data abstraction and observation. A manual data analysis was used, and it was guided by content technique.

**Results:** The results of the study showed that routine data and information are used to make several decisions, including; strategies for quality improvement, resource allocation, assessing the performance of the facility, and plan for malaria prevention intervention. However, it was observed that several factors are influencing healthcare workers to use routine data. Some of the factors are data management and analysis skills, type of health facility, number of HCWs, supportive supervisions, information use culture, the availability of data collection and report tools. Also, individual perception and attitude played a role in determining data use.

**Conclusion:** Data are instrumental in making the decision; however, for healthcare workers to use routine data for decision making, they are influenced by both the technical, organisation and individual factors.

**Recommendations:** A deliberate effort should be embarked to promote data use among healthcare workers and remove the barriers to data utilization.

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**LIST OF ABBREVIATIONS**

AIDS	Acquired immune Deficiency Syndrome
ANC	Antenatal Clinic
CHMT	Council Health Management Team
DC	District Council
DDH	District Designated Hospital
DHIS2	District Health Information System 2
DMC	District Malaria Coordinator
DMFP	District Malaria Focal Person
DMFP	District Malaria Focal Person
DMO	District Medical Officer
DQA	Data Quality Assessment
DQA	Data Quality Assessment
DRC	Democratic Republic of Congo
DRCHCOs	District Reproductive and Child Health coordinators
GDP	Gross Domestic Product
GoT	Government of Tanzania
HC	Health Facility
HCWs	Healthcare Workers
HIS	Health Information system
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IDI	In-depth Interview
IDI	In-depth Interviews
IPTp	Intermittent Preventive Treatment in pregnancy
IRS	In-door Residual Spraying
ITNs	Insecticides Treated Nets
LGAs	Local Government Authorities
LLINs	Long Lasting Insecticide Treated Nets
M&E	Monitoring and Evaluation
MCM	Malaria Case Management

MoHCDGEC	Ministry of Health Community Development Gender, Elderly and Children
MOI	Medical Officer In-charge
MOP	Malaria Operational Plan
mRDT	malaria Rapid Diagnostic Test
MSD	Medical Stores Department
MSDQI	Malaria Service and Data Quality Improvement
MTUHA	Mfumawa Taarifa za Uendeshaji Huduma za Afya
NMCP	National Malaria Control Program
NMCP	National Malaria Control Program
NMCP	National Malaria Control Programme
QI	Quality Improvement
RCH	Reproductive and Child Health
RCH	Reproductive Child Health
RMFP	Regional Malaria Focal Person
RMO	Regional Medical Officer
SOP	Standard Operating Procedure
Tshs	Tanzania Shillings
UNEP	United Nations Environmental Program
WHO	World Health Organization
ZAMEP	Zanzibar Malaria Elimination Program

## DEFINITION OF TERMS

**Council Health Management Team (CHMT):** Health staffs that are part of the district health management team chaired by the District Medical Officer (DMO). This team is involved in reviewing health facilities reports, plans, and budget approval.

**Data use Capacity:** Skills and knowledge of health care workers in manipulating and using data.

**Data Use:** Analysis, synthesis, interpretation, and review of data for data-informed decision-making process regardless of the source of data (Harrison T, Nutley T, 2010)

**Decision Making:** The cognitive process leading to the selection of a course of action among alternatives.

**Evidence Decision Making:** Proactive and interactive process that consider data during program planning, review, monitoring and improvement; service provision; and policy development and review.

**Regional Health Management Team (RHMT):** Health staff members of the regional health management team, Chaired by Regional Medical Officer (RMO). This team is involved in reviewing district reports, plans, and budget approval.

## CHAPTER ONE

### 1.0 INTRODUCTION AND BACKGROUND

#### 1.1 Background

Data are the lifeblood of decision-making and the raw material for accountability. Without high-quality data, providing the correct information on the right things at the right time, designing, monitoring, and evaluating effective policies becomes almost impossible. There are vast and growing inequalities in access to data and information and the ability to use it (Githinji et al., 2017). Too often, existing data remain unused because they are released too late or not at all, not well-documented and harmonised, or not available at the level of detail needed for decision-making. Arguably, routine health data are of pivotal importance in influencing the decision making of healthcare services. In terms of malaria programmes and interventions, data are being routinely gathered to enable Healthcare Workers (HCWs) to make an informed decision regarding the delivery of malaria services. For instance, Ashton *et al.* (2019) argued that routine malaria data was used to plan, develop, and implement prevention malaria interventions. This has also been supported by Ghilardiet *al.* (2020), who ascribed that routine malaria data are being used in the distribution of Long Lasting Insecticide Treated Nets (LLINs) and In-door Residual Spraying (IRS) in the areas where there are most malaria affections. Moreover, routine malaria data are constantly used by HCWs in procurement and forecasting of malaria commodities, improving the quality of healthcare services (Githinji et al., 2017; Ohiriet *al.*, 2016).

Recently, there is a substantial growth of external funding for health programmes, accompanied by increased demand for data to accurately track and inform the progress and performance made by implementing such programmes (Githinji et al., 2017 and Boerma *et al.*, 2009). Again, this has somehow contributed to embracing result-based financing approaches, which major donor has highly favoured. This has created the demand for timely and reliable use of routine health data to make further informed decision about the services being provided (Boerma *et al.*, 2009).



Despite the demand and enormous advantages of using health data for decision making, the health metrics network observed that some countries or at least health facilities have weak systems for gathering, managing, and using health data and information for deciding healthcare management and service delivery. This gap is what health data analysts and managers referred to as the “information paradox,” is most apparent in the reliable documentation of important events, such as births and deaths. Given the current turbulent technological advancement has undeniably resulted in the efficiently gathering enormous health data and information. However, almost all of this information is static; it is not indexed, cannot be readily sorted, searched, summarised, or communicated electronically. Different studies indicated that service providers do not use the collected and published information to inform decision making. For instance, a study conducted in Kenya found that the data and information utilisation rate is only 30% among health facilities (Evans, 2011).

Several reports showed that using routine health data, malaria data in this context is affected by several factors that could be grouped into technical, organisational, and behavioural. For instance, some of the studies showed that analysis skills, the culture of data usage, supportive supervision and regular feedback affect HCWs capacity to analyse and use data for decision making (Shiferaw *et al.*, 2017; Teklegiorgis *et al.*, 2014; Mucee, 2016; Andargie, 2006).

Asemahagn (2017) added that knowledge, workload, computer skill, computer access, availability of HMIS guidelines and formats influence HCWs capacity to analyse and use health data. Again, human resources and data quality are also associated with routine health information utilisation (Gibson *et al.*, 2013; Nutley and Reynolds, 2013). Moreover, Shiferaw *et al.* (2017) articulated that the availability of infrastructures, equipment, and Health Management Information System (HMIS) training affects HCWs' capacity to use routine data gathered. A report from Uganda revealed that HCWs had insufficient capacity to use data due to lack of training on computer software, data management, and HMIS were unable to understand the standard indicators and quality of data, subsequently making limited use of routine health data (Asiimwe, 2016).

Likewise, a recent study conducted in Tanzania showed that about 73% of HCWs did not have the capacity and skills to analyse data and use them (Mackfallen et al. 2019). In addition to that, the study found that the majority of the health facilities have a weak culture of analysing and using data in decision making. The study further noted that several factors hamper HCWs' capacity to analyse and use data in planning. The factors highlighted by this study include lack of training on collecting, analysing, presenting, and using data, poor or no Internet connectivity, and lack of equipment, such as computers, for data collection, analysis, and sharing (Mackfallen et al. 2019). Lower-level health facilities lacked Internet access, which limited their access to District Health Information System (DHIS2). Most health workers believed that data generated at health facilities belong to the Council Health Management Team (CHMT) and not the facilities, which explains why data analysis and use for decision-making are uncommon below the district level (ibid).

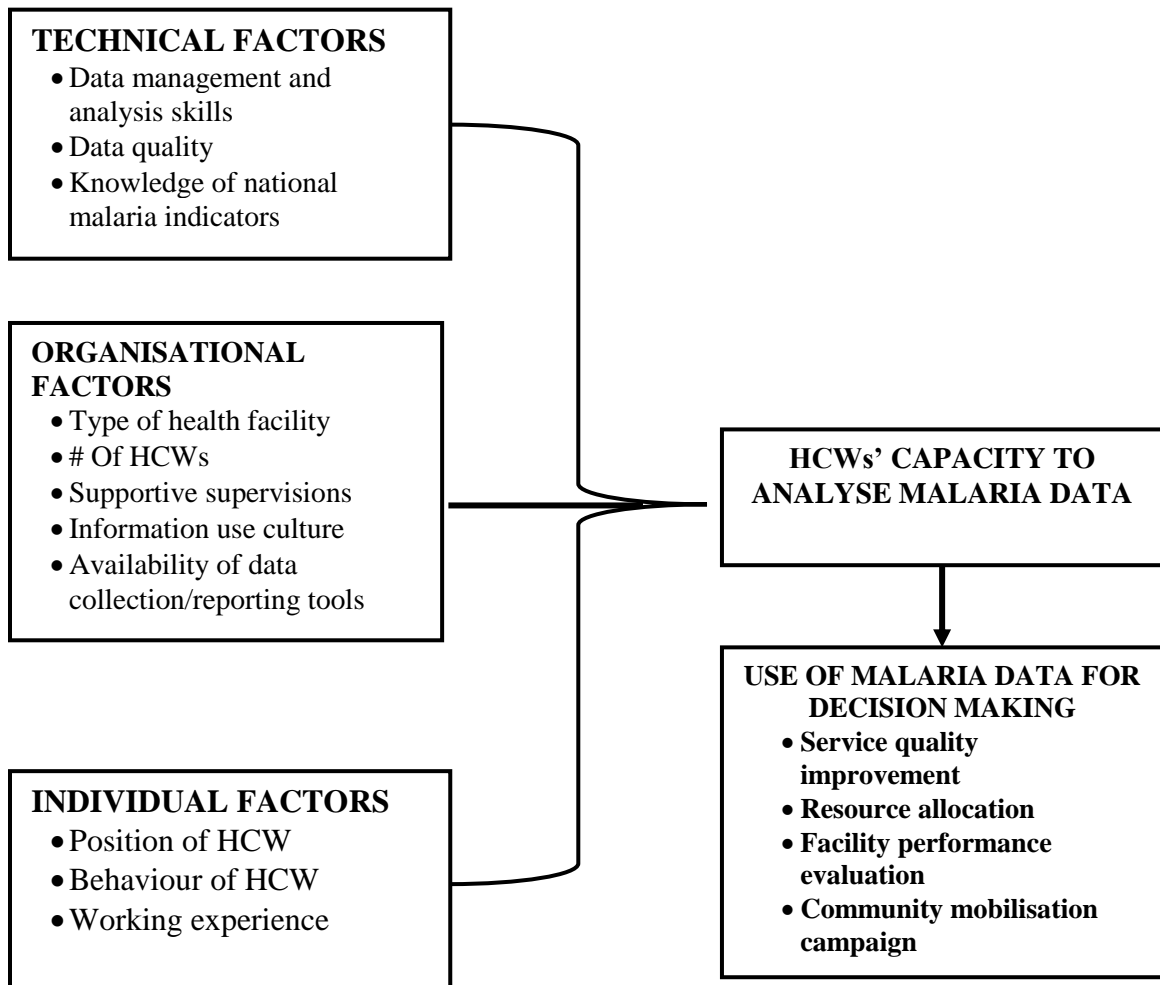
To curb the challenges to HCWs' capacity to analyse and use routine malaria data for decision making, the Government of Tanzania (GoT) has developed national malaria strategies, policies, and guidelines that act as the blueprint during the implementation of malaria programmes, intervention and service delivery. Some of these strategies, programmes, policies and guidelines include but not limited to the following; Malaria Operational Plan (MOP), National Malaria Control Program (NMCP), Zanzibar Malaria Elimination Program (ZAMEP) strategy, Tanzania Mainland's Strategic Plan for Malaria 2015–2020, National guidelines for diagnosis and treatment of malaria and WHO guidelines for the treatment of malaria. These malaria strategies, policies, and guidelines call for and require that all regions, districts, and health facilities analyse and use data for evidence-based decision-making (Mackfallen et al., 2019). In so doing, The GoT and development partners have invested in strengthening the country's Health Management, and Information System (HMIS), which connect routine health data gathered across all Local Government Authorities (LGAs) to DHIS2 (Karuri, Waiganjo, Daniel, & Many, 2014). Through this powerful web-based software it allows HCWs to analyse, report and disseminate data ready to be used for decision making at different levels it is at the facility, district, regional or national level

These investments include connecting all LGAs to DHIS 2—a web-based platform and powerful software for analysing, reporting and disseminating data for health programs. DHIS 2 and other specific program-based health information systems continue to generate information for decision making. The endgame of doing this is to improve health outcomes in the population by counterchecking malaria burden, whilst the interpretation of malaria data gathered on a routine basis. Despite this, still, the reports show that there is weak usage of malaria data by HCWs, and their capacity to analyse and interpret is relatively low (Peter and Christof, 2010). Given this backdrop, it caught the researcher's attention to venture on examining the factors influencing HCWs' capacity to analyse and use malaria data for decision making while taking health facilities found at the Uvinza district as the case study.

## **1.2 Conceptual Framework**

A conceptual framework is an analytical tool that presents organised flow charts or graphs or descriptive form showing several variations in a different context. Generally, it helps the study to show readers how the problem under study can be addressed. In this study, a conceptual framework has been adopted to link the relationship between different factors that can influence HCWs' capacity to analyse and use malaria data for decision making.

As highlighted in the background presented in the previous section, HCWs' capacity to analyse and use malaria data for decision-making is influenced by several factors that could generally be grouped into three categories: technical factors, organisational or institutional factors, and behavioural or individual factors. These three categorical factors that influence HCWs' capacity to analyse and use malaria data are represented in the below conceptual framework (See Figure 1.1). The technical component refers to systems such as data collection processes, systems, and methods. The organisational component refers to the structure and processes of the organisations that use the resulting information. In comparison, the behavioural/individual component refers to the behaviours of data users and how data are used for problem-solving and program improvement. These three components were used to identify opportunities for and constraints to practical data analysis and use.



**Figure 0.1: Conceptual Framework on Factors Influencing HCW's Capacity to Analyse and Use Malaria Data for Decision Making**

The conceptual framework above illustrates factors under three categories: technical, organisational and individuals and how they can influence HCWs' capacity to analyse malaria data, resulting in HCWs' ability to use malaria data for decision making. Arrows present the nature of relationships. This is to say that, from the left three boxes, it shows factors under technical, organisation and individual levels which have a direct relationship with the capacity to analyse and use malaria data for decision making as presented in the right two boxes of the conceptual framework. The conceptual framework implies that, positively, one or more factors on the left side increase the chance of HCWs having the capacity to analyse and use malaria data for decision making. For instance, when HCWs have good knowledge of data management and analysis skill, they will increase their capacity to analyse the malaria data and use it to make the appropriate decision. Therefore, the more the availability of the factors, the more HCWs can have enough capacity to analyse and use malaria data for decision making.

### **1.3 Problem Statement**

Data use has been of paramount importance in helping the health sector to make an informed decision about the design, development and implementation of the health programmes, intervention, policies and strategies. There is increased demand for data collection and reporting from external donors and government agencies (Githinji et al., 2017 and Boermaet *al.*, 2009). Demand for health data is the responsibility of all health stakeholders, starting with HCWs (Obwochaet *al.*, 2016). Failure to use data could prevent service providers and other decision-makers from making correct decisions during planning, monitoring, and resource allocation. Despite this, there is limited capacity among HCWs on data management and analysis and data usage for decision-making at the facility level (Peter and Christof, 2010). This substantially contributes to HCWs failure to respond to the health-related needs correctly (Foreit, Moreland, &LaFond, 2006). In this case, most HCWs are making a decision based on anecdotes and gut feelings (Fapohunda, 2012). This has a negative repercussion on the current and long-term performance of many health programs., including malaria.

Several scholars (Shiferaw *et al.*, 2017; Ohiriet *al.*, 2016; Okello *et al.*, 2019; Wudeet *al.*, 2020) have tried to address the factors influencing HCWs' capacity to analyse and use health data for decision making; among the factors highlighted include but not limited to; data analysis skills, availability of data collection and reporting tools, knowledge on indicators, supportive supervision, the culture of information use and behaviour of HCWs. However, there are limited studies carried to address factor influencing HCW's capacity to analyse and use malaria in the context of Tanzania. The empirical studies available (Mboeraet *al.*, 2017 and Kitojoet *al.*, 2019) employed a quantitative approach while focusing on health facility rather than HCWs. It is against this void that caught the attention of this study to examine the factors influencing HCWs' capacity to analyse and use malaria data for decision making, taking the case study of selected health facilities found in Uvinza district located in the Kigoma region, Tanzania.

#### **1.4 The rationale of the study**

The carrying of this study had some significances. Firstly, it helps to bridge the existing knowledge on the existing literature on the capacity of HCWs to analyse and use malaria data for decision-making in the context of Tanzania. Moreover, this study helps to point out the factors which could be translated to strengthen the use of health data in decision making. The study makes recommendations on the best ways to achieve the decentralisation of health information, hence improving health services through data use for decision making. The study also helps the facility management team, RHMT, CHMT, national-level actors and other stakeholders to appreciate the importance of data use.

Additionally, the findings of this study can help policymakers and programme planners understand the factors that influence the capacity to analyse and use data then develop robust strategies or initiative to promote data use among HCWs. In other words, this is to say, the recommendations made under this study can be used to guide policymakers and malaria program managers to come with a plan to capacity HCWs on data analysis and usage.

#### **1.5 Main Research Question**

The main research question was what factors influence health workers' capacity to analyse and use malaria data for decision making at the Uvinza district?

##### **1.5.1 Research Questions**

- i. What are the technical factors influencing health workers' capacity to analyse and use malaria data for decision making at the Uvinza district, Kigoma region, Tanzania?
- ii. What are the organisational factors influencing health workers' capacity to analyse and use malaria data for decision making at the Uvinza district, Kigoma region, Tanzania?
- iii. What are the behavioural factors influencing health workers' capacity to analyse and use malaria data for decision making at the Uvinza district, Kigoma region, Tanzania?

## **1.6 Objectives**

### **1.6.1 Broad Objective**

The general objective of this study was to assess the factors influencing health workers' capacity to analyse and use malaria data to make an informed decision in the Uvinza district.

### **1.6.2 Specific Objectives**

The following specific objectives guided the study.

- i. To identify technical factors influencing health workers' capacity to analyse and use health information for decision making at Uvinza district, Kigoma region, Tanzania.
- ii. To identify organisational factors influencing health workers' capacity to analyse and use health information for decision making at Uvinza district, Kigoma region, Tanzania.
- iii. To explore existing behavioural factors influencing health workers' capacity to analyse and use health information for decision making at Uvinza district, Kigoma region, Tanzania.



## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 Introduction

The following chapter offers a review of the literature addressing the HCW's capacity to analyse and use data for deciding while reflecting on the malaria programme. The chapter is moulded into five main sections, including the present one. Section two is about an overview of the malaria programme in Tanzania. Section three presents the importance of using malaria data for decision making. While section four reflects on the empirical studies conducted on the factors influencing HCW's capacity to analyse and use data. The chapter is then windup by providing a knowledge gap derived from the reviewed works of literature.

#### 2.2 Importance of Using Malaria Data for Decision Making

Availability of health data is the foundation of decision-making across all health systems. It is also essential for health system policy development and implementation, governance and regulation, health research, human resources development, health education and training, service delivery and financing. Improving service delivery requires data but sometimes are not used effectively by decision-makers. Without having interventions to improve the use of data in decision and policymaking, the government cannot meet the needs of the populations they serve (Traore *et al.*, 2014). It is essential to ensure that the collected data are accurate, timely, and accessible to all health stakeholders. Availability and the rapid dissemination of data are necessary if health authorities wish to maintain health care at an optimal level.

In recent years, data use has become an important issue because of its importance in promoting high standards of patient care and its impact on government budgets to maintain health services. Arguably, authorities at all levels of health care, including hospitals, community health centres, outlying clinics, aid posts, and ministries or departments of health, should be concerned about the use of data in the delivery of health care. The use of data for decision making has been studied by several scholars, as highlighted in the proceeding paragraphs;

Kitojoet *al.* (2019) studied the usage of malaria data in estimating the malaria burden among pregnant women from antenatal care centres in Tanzania. The study gathered data from pregnant women attending their first antenatal care appointment between 2014 and 2017 from all 8291 facilities in Tanzania. The data were obtained from DHIS2 systems. The study found out that the routine malaria data collected helps develop an intervention towards curbing the malaria burden by stratifying areas of endemicity and assessing ongoing intervention effectiveness. Also, through routine malaria data collected, HCWs and policymakers informed decision about malaria case management across different groups such as pregnant women and under five years children. Thus, the routine malaria data collected plays a vital role in cost estimation for making an informed decision to curb the malaria burden among pregnant women. The implication of this is that malaria prevention efforts are geared towards the area where the collected data shows a significant disease burden.

Afoakwahet *al.* (2018) conducted a cross-sectional study on malaria infection among children under five while focusing on data use from large-scale interventions in Ghana. Their investigation shows how systematic collection of malaria data can help intervention make informed decisions. It was noted that the malaria intervention implemented in Ghana was able to identify the individual and environmental factors associated with the odds of malaria infections among children. For instance, the data showed that, from malaria testing results, it was noted that more children from rural areas had much higher odds of being infected with malaria compared to their counterparts in urban settings. This could potentially be due to the everyday use of intervention tools such as Insecticides Treated Nets (ITNs) among rural folks. Thus, having such data enables the interventions to inform malaria measures, such as the distribution of ITNs as the primary preventive measure.

Likewise, Ghilardiet *al.* (2020) explored malaria risk mapping at the country level, conducted in three countries: Kenya, Malawi, and the Democratic Republic of Congo (DRC). The study employed a documentary review and conducted 64 in-depth interviews with stakeholders. The results it was possible to map malaria incidences through routine malaria data collected by so doing, mapping of malaria intervention became easier.

For example, routine malaria gathered by HCWs equipped national malaria strategic planning by developing the preventive interventions based on the results revealed by routine malaria data. Some of the intervention developed using routine malaria data, including Long Lasting Insecticide Treated Nets (LLINs) and Intermittent Preventive Treatment in pregnancy (IPTp), whilst in Malawi and DRC, the maps were used to target In-door Residual Spraying (IRS) and LLINs distributions in schools. The routine malaria data and maps were also used in making informed decision related to operational planning, supply quantification, financial justification and advocacy. The study concluded that malaria maps are generally used to identify areas with high prevalence to implement specific interventions; however, to have such good maps, routine data should be collected to develop such maps.

Ashton *et al.* (2019) studied the use of routine health information system data to evaluate the impact of malaria prevention interventions in Zanzibar, Tanzania, from 2000 to 2015. The study analysed the secondary data from HMIS from public outpatient facilities using interrupted time series models to evaluate the impact of malaria control interventions. The study revealed that confirmed malaria case counts derived from surveillance data provide a more direct indicator of malaria intervention impact. Furthermore, the data gathered on malaria cases helped make proper distribution of LLINs and IRS scale-up, which were attributed to reducing malaria incidences in Zanzibar. Finally, this study observed that the systematic collection of malaria data could influence informed design, development and implemented prevention intervention.

Moreover, Simba and Mwangi (2005) argued that data that is accurate, complete, and delivered on time to users (as information) is an essential aspect of health planning, management, and decision making. Evidence-based plans and decisions must, of necessity, be based on accurate, complete, and timely data. Therefore, decisions to use or not to use these data are made subjectively. Aljunidet *al.* (2012) added that the primary objective of collecting healthcare data is to aid the policymakers and researchers in policy decision-making and create an awareness of healthcare issues for the general public. Also, data is being used in monitoring the health system's performance is still in the process of development.

Lastly but equally important, it has been put forward that correct, and up-to-date data is critical, not only for the provision of high-quality clinical care, but also for continuing health care, maintaining health care at an optimal level, clinical and health service research, and planning and management of health systems. Furthermore, accurate data about resources used and services delivered at all levels of health care is essential for resource management, clinical evidence, and measurement of outcomes to improve healthcare services' effectiveness.

### **2.3 Factors Influencing HCW's Capacity to Analyse and Use Malaria Data**

Different scholars have studied the factors influencing HCWs' capacity to analyse and use data for decision-making across health programmes. In the proceeding paragraphs work of some scholars are presented. It is worthwhile to mention that the literature presented varies across geographical and time dimensions.

Information within many developing countries is not adequately managed and used because of shortages of financial resources and professional staffing, lack of awareness of the value and availability of such information and other immediate or pressing problems. Moreover, even where information is available, it may not be easily accessible, either because of the lack of technology for adequate access or associated costs, especially for information held outside the country and commercially available commercially. The reasons that limited access to some data are privacy protection, fragmented health care system, poor unclear policies to access the data, quality of routinely collected data, and control on the freedom of publication. This also affects HCW's capacity to use the available data for decision making. For instance, limited access to data hinders HCWs from conducting proper analysis and making the informed decision.

Aleganaet *al.* (2020) examined the routine data for malaria morbidity estimation in Africa. In their study, it was revealed that the capacity of HCWs to used malaria data is affected by several factors, including; the existence of multiple systems of data capturing and reporting, use of multiple registers located in different departments such as the outpatient departments, the inpatient department, antenatal clinics and the laboratory. All of these contribute to the variation of data captured, and multiple recording contribute to

inconsistencies. The implication of this is that, due to poor quality of data and inconsistent, HCWs cannot effectively analyse and use malaria data to inform strategic investment is central to maximising impact.

Wudeet *al.* (2020) ventured to analyse the utilisation of routine health information and associated factors among HCWs in Hadiya Zone, Southern Ethiopia. A cross-sectional study design was employed to reach a total of 480 HCWs. The results of this study showed that a good level of utilisation of health information was observed among HCWs which was attributed to the availability of training that capacitates HCWs with the analysis skills to enable their ability to analyse and use health information. More importantly, having a standard set of indicators and HCW's competence to perform routine health information tasks was the predictor of health information and data usage.

Another study by Gueyeet *al.* (2016) ascribed that routine malaria data helps national programme management achieve malaria elimination. The programme's progress is precisely shown with the improved data quality, which represents the malaria burden. However, the study revealed that the motivation of workers was among the critical factors for improved quality of malaria data which subsequently contributed to maintaining programme quality. The study concluded that improving the quality and analysis of malaria data is fundamental for efficient allocation, resource use, and examining whether they have the desired impact on malaria burden.

Okello *et al.* (2019) conducted an exploration of the micro-practices and processes shaping routine malaria data quality in frontline health facilities in Kenya. The study employed ethnographic methods including observations, records review, and interviews of the four health facilities and two sub-county health record officers. In addition, they employed a thematic technique to analyse the gathered data. The study's findings showed that malaria data generation for usage in decision making was influenced by some factors, including human resource shortages, tool design, and stock-out of data collection tools. The study further identified that HCWs had adopted various mechanisms such as informal task shifting and improvised tools to respond to these challenges. These capacitate HCWs on sustained the data collection process and had considerable implications for the data recorded.

Mboera *et al.* (2017) ventured to analyse malaria surveillance and evidence in planning and decision making in Kilosa District, Tanzania. The study employed a structured questionnaire and checklist, whereas the data were gathered from 17 health facility workers and three members of the CHMT from Kilosa DC. More importantly, data collection also involved direct observations of reporting and processing, assessment of report forms and reports of processed data. The study found out that at least half of the facilities visited reported malaria data to the district level for further decision making. The factors that were found to influence the report of malaria data and their usage included; unavailability of compilation books; lack of computers; poor data storage; incomplete recording; lack of adequate data analysis skills; and increased workloads. Generally, the study revealed that the malaria data analysed at both the health facility and district level were used for determining and forecasting drug requirements. The study concluded that the malaria surveillance system in Kilosa DC was found to be weak, and utilisation of malaria data for planning and decision making was found to be generally poor. Moreover, the call for capacity strengthening on data analysis and utilisation should prioritise HCWs and CHMT members.

Ohiriet *et al.* (2016) assessed data availability, quality, and use in malaria program decision making in Nigeria. The study employed semi-structured interviews during data collection, whereas 65 key informant interviews assessed how malaria data were used. The study observed that DHIS2 was the primary source of the data used in managing malaria programs for the availability of malaria data. However, the range of malaria indicators was limited available at DHIS2. This affected the decision making toward malaria surveillance and elimination. On the quality of data, routine malaria data were found to be somehow of quality standards. Again, DHIS data were reportedly used most often for performance and/or supply chain management. Overall, the study demonstrates gaps in data availability and quality and highlights the need for more data sources and improved quality data to inform decision making toward malaria elimination in Nigeria.

A study by Shiferaw *et al.* (2017) ventured to examine the routine health information system utilisation and factors associated thereof among HCWs at government health institutions in Ethiopia. A cross-sectional study design was employed, whereas 668 HCWs

were selected from government health institutions using the cluster sampling technique. Data were collected using a standard structured and self-administered questionnaire and an observational checklist. The study identified that most HCWs interviewed had a good level of utilising routine health information, which was significantly associated with HMIS training, good data analysis skills, supervision, regular feedback, and a favourable attitude towards health information utilisation. Therefore, the study concluded that there should be comprehensive training, supportive supervision, and regular feedback, which will capacitate HCWs to routine use health information and data for decision making.

Another study by Githinji et al. (2017) assessed the role of completeness of malaria indicator data across health facilities using DHIS2 in Kenya. Secondary data from DHIS2 were quantitatively analysed from 6235 public and 3143 private health facilities. It was noted that the completeness of malaria indicator as linked to malaria data was observed much higher in public facilities than in private facilities. The reason behind public facilities using malaria data in indicator reporting was to meet donors' requirement and forecast commodity needs. Also, lack of competency among HCWs in collecting the required data was another factor influencing the completeness of malaria data and its use in reporting. The study concluded that there should be ongoing efforts to integrate malaria test data into DHIS2 to promote completeness and data usage.

Also, Rumish et al. (2020) carried a cross-sectional study to assess the data quality of the routine management information system of health data, including malaria, at the 115 primary healthcare facilities in Tanzania. The data were collected using reviews of documents, information systems and databases, and collection of primary data from facility-level registers, tally sheets and monthly summary reports. The study found that most health facilities used data mainly for reporting purposes. Whereas, availability of data collection and reporting tools were the critical factors for HCWs at health facilities to use the routine data. Moreover, the study established that poor data collection, like leaving blank space in registers, affected the capacity of HCWs to analyse the data. Additionally, many patients and multiple variables affect the capacity of HCWs to analyse and use data. In this regard, the study called for designing tailored and inter-service strategies for improving data quality and its utilisation.

Furthermore, it has been revealed that, despite a great deal of routine data collected at the health facility level, much of it is collated and sent elsewhere for reporting purposes. Too often, program managers and providers do not have the capacity, time, or resources to analyse the data collected to monitor service delivery or assess problems and identify new strategies for improving health services.

#### **2.4 Knowledge Gap**

The reviewed empirical literature has shed light on the factors influencing HCW's capacity to analyse and use malaria data. Undoubtedly, the kinds of literature had the common consensus that malaria data are of significant value in influencing the informed decision making related to the improvement of healthcare policies, financing and planning. Also, it helps to promote the delivery of malaria services through ensuring quality improvement, in particular. The above-reviewed literature suggested that for HCWs to be able to analyse and use malaria data used is a result of some factors, including but not limited to the following; financial resources, availability of data collection tools, HCWs should be aware and knowledgeable about the data collection process and methods. Also, the culture of data usage among HCWs and policymakers is another factor that influences the routine use of gathered data. Finally, other factors are related to individuals, such as the awareness and attitudes of HCWs towards systematic data collection and utilisation. In a nutshell, this is to say, the factors influencing routine use of malaria data for decision making can be grouped into three categories, namely, organisational, technical and individuals. It is, however, essential to pinpoint out that the influence of these factors varies across from one facility to another, one country to another, even across different time frames, given the facts that the policies and priorities towards data utilisation are in constant motion. It is against this backdrop, where the present study found a gap for further exploring the factors influencing HCWs' capacity to analyse and use malaria data while taking the case study of Uvinza DC, Tanzania.



## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Introduction**

This chapter presents and justifies the methods and design employed in this study. The chapter is made up of different sections complemented by several sub-sections. In details, the chapter elucidates and justifies the study design, study area, population, sampling procedures and sample size, methods of data collections, validity and reliability of the instruments, data analysis strategy and ethical issues.

#### **3.2 Study Area**

The research was conducted in the Uvinza district, found in the Kigoma region, established under the Local Government Authority Act.7 of 1982. The council covers 10,178 square km, of which 6,425 sq km is covered with water, mainly Lake Tanganyika and extensive swamps at Nguruka. The council borders with the Mpanda District in Katavi Region in the Southern part, Kailua District in the Tabora Region in the Eastern part, and Democratic Republic of Congo (DRC) in the Western part Kigoma and Kasulu District in the Northern part. The district is located within a longitude 5'00 and 6' 55, Southern Equator and longitude 29' 35 and 31' 30 eastern Greenwich. The council is divided into three topographical zones – the high land, low land, and Lake Tanganyika zones. Lake Tanganyika has a positive influence on rainfall patterns.

Regarding the health profile of the council, there are a total of 42 health facilities located in the Uvinza district. There is one District Designated Hospital (DDH), 7 health centres and 34 dispensaries. In terms of ownership, the district has 40 and 2 health facilities under government and private ownerships, respectively. Inconsistent with the study design, 4 health centres and 4 dispensaries were reached by the study. The reason for choosing these facilities lied because the study aimed to generate diversified experience and practice of collecting and utilising malaria data and comparing different categories of health facilities. The Kigoma region was chosen based on the highest malaria prevalence rate of 27%. Uvinza DC was specifically chosen because of the trends of malaria cases within the district from 2017, 2018 and 2019, with rates of positive malaria cases of 9.2%, 6.0% and

9.5%, respectively. From this trend, it is seen that in 2018 the cases were reduced, but in 2019 they increased. It is within this backdrop that caught the eye of the study to select Uvinza DC as the study area.

### **3.3 Study Design**

This study employed a descriptive cross-sectional study design to assess factors that influence health workers capacity to analyse and use malaria data. The justification for selecting this design is that descriptive cross-sectional design helps plan or administer preventive or health care services, in this context, malaria (Creswell, 2012). Thus, this design's adaptation helped the study unpack the different factors that influence the practice of using malaria data gathered from health facilities.

Another critical justification is that descriptive cross-sectional design is highly suitable for comparing the services offered from two or more groups of interest (Creswell, 2012). In this regard, different health facilities such as health centres and dispensaries found in Uvinza DC were recruited into the study. Moreover, a comparison was made across the recruited health facilities to assess how and why some facilities use or do not use malaria data concerning different factors.

In line with the above design, a qualitative approach was employed to gather necessary data and information to answer the study's specific objectives. The use of this approach had some justifications too. The study aimed to capture the experiences of HCWs about their practices on the usage of malaria data and information at health facilities and the associated factors which influence such usage. The rationale for this relies on the strength of the approach itself, as it enables participants to interpret and make sense of their practice and the world in which they live (Creswell 2014; Mason 2002; Silverman, 2004).

### **3.4 Study Population**

The population of interest was HCWs who are working at health facilities located in the Uvinza district. The choice of such population was based on the fact that they are responsible for gathering malaria data daily and are users of the data and information generated for decision making and improve the quality of services in a way. In addition,

the study included health officials from districts as part of the population of interest. Just to be precise, the study reached the following population, facility in-charges, facility-based service providers, reproductive and child health in charges and members from Council Health Management Team (CHMT). The selection of these various categories had some scientific justification, such as it assisted in obtain of the variability of information, which also supported the study design employed. All these target groups are important decision-makers concerning planning and programming or user of malaria data and information gathered daily.

Health Care Workers (HCWs) were necessary because they are the custodian and responsible for collecting malaria data and use them for making the decision and improve the quality of services provided at the facility levels. Therefore, the study thought to acquire their day to day experience and practice as far as the objectives under the investigation are a concern. Again, the population from CHMT such as DMO, malaria focal person, HMIS focal person and DRCHCo were targeted to obtain the overall experience on the matters related to malaria data and information for planning and administering malaria preventive measures at the council level.

### **3.5 Selection of Study Participants**

The study used both purposively and simple random sampling methods to sample health facilities and HCWs to be interviewed. The sampling procedures involved three steps; the first step was a selection of region and district. The Kigoma region was purposively selected due to the high prevalence rate of malaria, while Uvinza DC being part of the region, was randomly selected. The second step involved the selection of health facilities from the Uvinza DC. The health facilities in Uvinza DC are distributed as follows: Tier one and Tier two health facilities. Tier one health facilities deliver services for more than two hundred clients per month, and Tier two health facilities are health facilities that deliver services for less than two hundred clients per month. Currently, Uvinza DC has 18 Tier one health facilities and 24 Tier two health facilities. Reaching all facilities was not possible given the time constraints, so the study randomly selected four health centres and four dispensaries. The random selection of these facilities aimed to assess the factors

influencing HCWs' capacity to analyse and use malaria data regardless of the high prevalence rates of malaria or low prevalence rates in each facility.

At the third stage, a purposive selection of study participants was made. The study worked closely with the health facility in charge to identify eligible HCWs. Once the eligible HCWs have been identified, the researcher approached them and used the provider recruitment script to introduce the study and confirm provider eligibility by screening inclusion criteria.

Upon meeting the above criteria, a strategic appointment for the interview were made accordingly. In other words, this is to say, appointment scheduled when study participants were free from their routine timetable or when the volume of patients at the facilities was low. On the agreed date of the interview, a consent form was read or given to the Participant to read to get informed consent to continue with the interview.

### **3.6 Sample Size**

Reaching all study population was not realistically neither practical. Thus, having a representative and appropriate sample size sufficed the need for study as far as data collection was concerned. However, it was important for the study to assert that the sample size for qualitative studies is flexible. There is no moral authority to stick to a pre-calculated sample size as in quantitative studies. This is because the information generated in the qualitative study cannot be quantified like in quantitative studies, somewhat subjectively generated from selected participants (Mason, 2002; Creswell, 2014). It has been argued by Creswell (2009) that, for a qualitative study, one should stop to gather information when the process reaches the level of saturation, meaning that even when more interview will be carried the process sparks no new insights. Consistently to this, the study was able to reach 8 health facilities for data collection. The study aimed to reach at least 50 participants. However, only 41 study participants consented to be interview, 8 HCWs were unavailable during the time of data collection, and only 1 HCW did not consent to the interviews. Nevertheless, the study population, i.e., 32 HCWsa in 4 CHMT, enabled the study to reach saturation.

### **3.7 Data Types**

This study used both primary and secondary data types gathered at health facilities and Uvinza DC. The primary data were directly obtained from study participants through interviews, observation and checklist. In contrast, secondary data were obtained through documentary reviews. The essence of collecting both primary and secondary data types was meant to explore different questions to assess the specific objectives guiding this study. In the subsequent paragraphs, questions explored for each specific objective are elucidated in details;

The first objective focused on assessing the technical factors which influence HCWs capacity to analyse and use health information for decision making. In this regard, the objective was assessed by examining the following questions; data analysis skills and knowledge on national malaria indicators. Specifically, these questions were assessed to see whether they influenced the HCWs' capacity to analyse and use the routine malaria data for decision making.

The study's second objective was to identify the organisational factors influencing HCWs capacity to analyse and use health information for decision-making. The organisational factors were measured by examining factors like; type of health facility, the number of HCWs dedicated to providing service and treatment for malaria cases, supportive supervision with feedback meetings, information use culture, and data collection and reporting tools.

Lastly but equally important, the study explored the existing individual factors influencing HCW's capacity to analyse and use health information for decision making. In terms of this objective, the study assessed patterns such as the position of HCW; personal behavioural and working experience can have a subsequent impact on the effectiveness of using health information for decision making.

### **3.8 Data Collection Methods**

The study employed qualitative methods of data collections which included In-depth Interviews (IDIs) and observations as explained in the subsequent subsections.

### **3.8.1 In-Depth Interview**

This method was used to gather copious information regarding factors influencing the usage of malaria data in health facilities. The selection of these methods comes from its strength and trust that information generated is from knowledgeable enough participants and have lived experience about the topic under the study. Therefore, this method made sure that relevant circumstance or context are integrated (Mason, 2002). Doing so helped the study acquire participants' subjective knowledge, feelings, practice, and narrative related to research questions guided this particular study.

The participants who fell under this method were grounded on interview guides. The guides were structures with open-ended questions based on specific objectives of the study and research questions. The guides were framed so that it allowed room for further probing to deeply acquire a thicker layer of information regarding factors influencing the use of malaria data for decision making. More probing was conducted when new insight emerged from the central questions. The interview guides ensured that leading and complex questions are avoided to allow room for easy understanding of questions before responding.

This method was used to generate information from both HCWs and members from CHMT. Just precisely, the method was used to gather information from facility medical officer in-charges, facility malaria focal persons, reproductive and child health in charges, laboratory technicians and nurses. For CHMT members, the IDIs were conducted with DMO, DRCHCo and district malaria focal person. More importantly, participants were interviewed independently at their office premises, and their responses were either documented through note-taking or audio-recorded when consent was obtained. The interview at facilities was strategically scheduled so that they did not interrupt the provisions of services to patients. That being said, interviews were conducted around break hours or when participants had free time.

### **3.8.2 Observation and Data Abstraction Checklist**

The study also employed an observation and data abstraction checklist. This method was purposefully chosen to gather the information which could not be captured or information

that participants forget to share during IDI sessions. Therefore, this is to say, the observation and data abstraction checklist was used to complement other interviews.

For this method, the study aimed to assess how malaria data are being shared in facility settings. This included displayed photos, displayed graphs and charts, displayed text, and a table with malaria data. Also, the display of malaria job aids was taken into consideration within this method. HCWs were further asked additional questions when deemed necessary. The purpose of the observations was to see if there were indications of data analysis and usage of the displayed in charts, graphs, text and tables. Upon consent from facilities, in-charges photos were taken.

In terms of data abstraction, the study extracted data related to malaria indicators from DHIS2 to assess whether there was progress made by the facilities and Uvinza DC as a whole. This is because one of the purposes of malaria data is to plan for preventive measures, which will contribute to the reduction of death related to malaria cases.

### **3.8.3 Documentary Review**

Another method of data collection employed in this study was documentary review. The documentary review helped the study identify the patterns of contents from other documents such as public malaria reports, standards and protocols (Patton and Cochran, 2002). Also, the grey works of literature related to the main subject of the study were considered during the documentary review. This method assumed three steps, namely; identifying documents related to the usage of malaria data; read all the identified documents thoroughly while establishing patterns related to research questions; and lastly, confirming the authenticity and appropriateness of the documents reviewed in step two.

### **3.9 Validity and Reliability of Qualitative Data and Tools**

In order to establish fidelity of qualitative study, Lincoln and Guba (1985) call for credibility and reliability to be of paramount importance. To operationalise validity, the study employed content validity by framing interview guides through the adaptation of questions from previous studies with a similar subject of investigation and then rephrasing questions to reflect the context of the present study areas. More importantly, the validity of data collection tools was ensured through the pre-test, which was conducted one week

before the actual study. After the pre-test was done, the study instruments were modified immediately before the actual data collection took place. For instance, questions that did not reflect directly with three categories of the factors identified in the framework were made redundant. The pre-testing was conducted in non-sampled health facilities, and the findings are not included in this final dissertation report. Again, to uphold the validity and credibility of responses given by study participants, all data collection tools were translated from English to Swahili for study participants to understand the questions and respond accordingly quickly. The translations were done by using simple Swahili to avoid ambiguity of word or sentences.

In terms of reliability, the study made sure that the response provided by study participants were captured in subjective meaning. In order to ensure this, tape recorders were used and notes taking was also performed. However, in the absence of audio recording, notes taken then immediately expanded after the interview to avoid the loss of intended meanings and the quality of information shared. Again, probing questions were administered to cross-check the quality and credibility of the information shared during the interviews.

Moreover, during data analysis and presentation, validity and reliability were upheld by this study. First, all audios were transcribed, and transcripts generated were thoroughly analysed using thematic techniques. Secondly, transcripts were thoroughly read several times to ensure all responses understood before creating themes and patterns related to research questions. Lastly, the presentation of the findings is made by using original quotations obtained during the interviews with study participants.

### **3.10 Data Management and Analysis**

Data management involved the process of transcribing the recorded audios and expanding the documented notes. Data were manually analysed using the content approach. Contentsanalysis technique was pertinent for this present study as a method of data analysis because it gave the study the ability and power to be flexible and efficiently manage the data obtained from fieldwork. More importantly, the study ensured a clear, logical flow and synthesis of the findings, which purposeful established while bearing in mind all other essential parts of the study that needed to be contextualised in the analysis.



Data analysis was initiated as early as during the fieldwork; this was done by expanding field notes and starting familiarisation with the recorded audios through listening to them before transcripts were generated. The generated transcripts were thoroughly read several times to establish contents and patterns related to the research questions that guided this study. This approach involved shortening and condensing the text and notes into codes without losing the quality of information. Data generated through observations and documentary review were also analysed using the content technique. It was worthwhile to note that the specific objectives informed the data analysis and research questions used as pre-defined contents, including; technical, organisation and behavioural factors. The detailed findings on the contents analysed is detailed presented in the next chapter.

### **3.11 Study Limitation and Mitigation**

Several limitations were faced while undertaking this study. The first and foremost limitation emerged from the study methodology approach employed; the study specifically focused on reaching a particular group of people, i.e. HCWs found at health facilities and members of CHMT. Such selection could not foresee their availability at the time of data collection. However, to overcome this, the study had to make strategic appointments with study participants. The strategic appointment is making an appointment with the interview when they are more likely to have less workload. This was done by scheduling the interview with HCWs when they were free from routine work, especially around breaks or lunchtime. Other strategic appointments were made when study participants, i.e., HCWs had few or no patients to attend. Regardless of the strategic appointments made, at least 8 study participants were not reached during the data collection. However, this had no effects on the results obtained since the level of saturation was observed from other interviews conducted.

The second limitation was based on the willingness of study participants in the study. This arises as some of the study participants at the health facilities and CHMT were reluctant to share the data required by the study in fear of data leak and exposing the HCWs work ethics. In order to overcome this limitation, the study acquired all necessary permits and approvals from the university and district authorities responsible for overseeing the health facilities. Therefore, the availability of the researcher at the health facilities to gather data

was known to DMO, who is responsible for overseeing all the health facilities at the district level, in this context Uvinza DC. Also, the study participants were provided with an informed consent form that stated the purpose of the study was for academic accreditation, and the consent form emphasises upholding principles of voluntary confidentiality and anonymity. Therefore, the study participants were resting assured that their identity and information shared was kept confidential during all stages of this study. Despite this, one study participant was not ready to provide his consent during the data collection stage.

### **3.12 Ethical Consideration**

Ethical clearance was obtained from the Muhimbili University of Health and Allied Sciences DRP research review committee on June 20, 2020, to ensure the study complies with all ethical standards (12: p. 17g). Official permission to conduct the study in the respective study area, i.e. Uvinza DC was attained through Kigoma Regional Medical Officer's (RMO) and Uvinza District Medical Officer's (DMO). At the health facility level, the permit was sought by the facility Medical Officer In-charge (MOI). Again, permission was obtained from all study participants, and this was done by providing participants with an informed consent form. Participants were ensured with the principle of confidentiality, anonymity, and other ethical issues (See Appendix I and II).

## CHAPTER FOUR

### 4.0 FINDINGS AND RESULTS OF THE STUDY

#### 4.1 Introduction

This chapter presents the key study findings on the factors influencing HCWs' capacity to analyse and use malaria data taking the case study of health facilities found in Uvinza district. The chapter is divided into seven sections complemented with several sub-sections, including this present one. Section two offers a detail, albeit in a nutshell, the response rate of study participants. Chapter three is about the routine use of malaria data and information for decision making—section four to six offers critical findings related to the three specific objectives which guided this study. Lastly but equally important, the chapter winds up by providing a summary of the findings.

#### 4.2 Response Rate of Study Participants

The study anticipated to initially reach at least 50 participants depending on the level of saturation. However, only 82% (41) of study participants provided their consent to be interviewed, of which 12 HCWs consented to be tape-recorded, and the rest did not. Hence, for none tape-recorded interviews, the approach of note-taking was evoked in capturing study participants' thoughts, ideas, and experiences regarding HCWs' capacity to analyse and use malaria data for decision making. The study reached 37 HCWs and 4 members of CHMT making a total of 41 respondents. Table 4.1 below summarises the distribution of study participants reached by the study.

**Table 0.1: Sample Size Distribution of HCW across Selected Health Facilities**

Facility name	Facility in-charge	Nurses	Lab technician	Pharmac ist	Total
Uvinza Health Center	1	2	1	-	4
Nguruka Health Center	1	1	-	1	3
Ilagala Health Center	1	2	1	1	5
Buhingu Health Center	-	2	1	1	4
Mwakizega Dispensary	1	2	1	-	4
Kazuramimba Dispensary	-	2	1	1	4
Mgambazi Dispensary	1	1	1	1	4
Kandaga Dispensary	1	2	1	-	4
Herembe Dispensary	1	2	1	1	5
<b>Total</b>	<b>7</b>	<b>16</b>	<b>8</b>	<b>6</b>	<b>37</b>

### 4.3 Use of Malaria Data for Decision Making

This study generally established an excellent routine use of malaria data and information for decision making among HCWs of the visited health facilities located in the Uvinza district. However, it was noted that health information is more likely to be used at district and regional levels than at health facility levels. This understanding was verified by the study participants' descriptions of the different ways they use malaria data and information. The subsequent sub-sections present several uses of health information and data that emerged from the interviews with HCWs and members of CHMT.

#### 4.3.1 Service Quality Improvement

The study participants interviewed reported that the routine malaria data and information gathered are instrumental in deciding for quality improvement regarding healthcare services. The study noted that malaria data and information gathered were very useful to health facilities. They helped HCWs with continuous actions that would lead to measurable improvement in healthcare services to malaria patients. One study participant argued that the routine malaria data and information help identify the services gaps and weakness and set the targets to bridge the service gaps and counter check the weakness. The below excerpts captured from the interviews with the facility in charge from UvinzaHealth Facility (HC) and Reproductive and Child Health (RCH) focal person from Ilagala HC justifies this;

*“...we usually encourage each other to use malaria data for quality improvement of services at facility levels. With data reported by facilities, we are usually planning for intervention and strategies to help the facilities that showcased poor performance in delivering the service or meeting the targets set...” (IDI with facility in-charge from one health facility).*

The other participant had the following views on the same subject

*“...routine malaria data review is constructive for our facility as it has helped identify and select the key areas of focus that need attention.... for instance, we use data to plan on intervention to reduce malaria cases among maternal within our facility...” (IDI with RCH focal person from one health facility).*

With the two statements above, it is fair to say that routine malaria data and information ensure continuous feedback and planning to improve healthcare services. These views from study participants were concomitant to the understanding of quality improvement by the District Malaria Focal person is also known as the District Malaria Coordinator (DMC), who commented the following:

*“...availability of data for malaria helps us to plan on how better to improve our quality of services in Uvinza DC. And, to be honest, we have achieved to reduce cases of malaria...” (IDI with one CHMT member from Uvinza DC).*

Thus, the study established that malaria data and information gathered on a routine basis are of significant importance to improving health services offered to patients. This is so because, with data availability, health facilities can make the informed decision and prioritise the services. For instance, during an interview with DMO, it was noted that routine data gathered have shown that under-five children and maternal are at higher risk of being attacked with malaria diseases and a significant number of under-five children and maternal deaths are due to malaria. In this regard, concerted efforts are continuously being made through quality improvement meetings with the hope of improving the provision of malaria healthcare services to under-five children and maternal.

#### **4.3.2 Resource Allocation**

Allocation of resources within the facilities was another key usage of routine malaria data and information gathered by health facilities. The study found that malaria data are being used by HCWs, facility management team and CHMT to re-allocate different resources ranging from human resources, equipment and tools needed to provide malaria healthcare services. During the interview with one of the facilities in charge, it was noted that data like the daily volume of malaria patients help to determine the number of HCWs and equipment required by the facility. This was captured in the following narration;

*“...we use the number of malaria patients registered at OPD to determine the distribution of health providers to attend the malaria cases and recording the patient information into registers. The allocation of providers is normally based on the number of patients expected per day and every month...” (IDI with facility in-charge from one health facility).*

In concomitant to the above, it was also revealed by the study that routine malaria data and information are used in the process of procurement of equipment and commodities. Pharmacists who were interviewed by this study reported that they usually depend on the monthly malaria data to order anti-malaria drugs and antibiotics. They added that, without the routine data and information, it would be difficult to know what amount of anti-medicine and drugs are required to suffice the treatment of patients in the respective facilities.

*“...these routine malaria data gathered are beneficial to us. Honest speaking, the availability of data have made it easier for us to request malaria commodities. That being the case, it is fair enough to say we use the routine malaria data to make an informed decision about procuring malaria commodities from CHMT...”*  
**(IDI with the nurse from one health facility).**

Another pharmacist further argued that they do not just rely on routine data to order anti-malaria medicine and drugs; instead, they depend on accurate and quality data. In the absence of accurate data and information, it was observed that it might mislead the procurement process because the facility can have deficient in malaria medicine for all its malaria patients. This was captured during an interview with a pharmacist from Kazuramimba dispensary who had the following statement to comment;

*“...yes, data is useful for planning example, for me as a pharmacist, every day, I have to check my records, including how many malaria patients I have attended and how many anti-malaria dosages I have dispensed to them. This helps me to plan on the flow of drug flow, and to know which group of patients are highly infected with malaria so I can request more drugs for them...”*  
**(IDI with the pharmacist from one health facility).**

Laboratory technicians also concurred with what pharmacist was saying regarding malaria data to procure malaria equipment and commodities. It was found out that the testing equipment is usually ordered based on the capacity of malaria patients they receive every month. Thus, it would be challenging for a laboratory technician to anticipate the required stock of testing equipment such as mRDT needed without such data and information.

### 4.3.3 Facility Performance Evaluation

Another practical use of routine malaria data and information is to evaluate the performance of HCWs and facilities in general. It was revealed by study participants that facilities have weekly performance assessment on HCWs and how the facility performs in terms of providing the services for different services, including malaria healthcare services.

*"...for me, one of the important use of health data like malaria data is to evaluate the performance of the facility; for instance, the malaria data related to the distribution of LLIN to pregnant women and under-five women, help us to know how many pregnant women and children we have provided with LLIN and how many we have not, as the goal is to ensure that all pregnant women and under-five children are sleeping with insecticide-treated nets. So, we normally take this into account to assess our performance by compiling different malaria indicators..." (IDI with a medical attendant from one health facility).*

Additionally, the study found that each facility is supposed to report different indicators to the district malaria focal person, uploading such indicators to DHIS 2 system. The indicators reported monthly are daily gathered. Such indicators help facilities to assess themselves as far as delivery of malaria service is concerned. This help CHMT to know how different facilities perform monthly, which is essential in planning for supportive supervision for the facility with poor performance. This was confirmed by narration captured during the interview with Uvinza DC malaria focal person.

*"...we used data submitted by facilities to evaluate their performance and plan for the way to improve. For example, the submitted malaria data are used to compile malaria indicators that show how different facilities perform against the targets. Let us say if the facility is implementing malaria prevention intervention. We use routine malaria data to track how efforts of the facility like distribution of LLIN or IRS have been made within the facility catchment area ..." (IDI with one CHMT member from Uvinza DC).*

For instance, implementing the National Malaria Control Programme (NMCP) reduces malaria incidences over time. Thus, for health facilities, CHMTs and RCHMTs to know if they are making any progress regarding reducing malaria incidence, they need malaria

data, which will show how they fare in reducing malaria cases. Figure 4.1 illustrates the trends of malaria incidences recorded per testing kits used by HCWs. From the figure, it is seen that the trends are decline over time, meaning the CHMT and health facilities can evaluate their progress by using the malaria data available at their disposal.



**Figure 4.1: Trend of Malaria Positivity Rates Per Testing Kits, Uvinza DC**

Source: DHIS2 (2021)

#### 4.3.4 Community Mobilisation and Sensitisation Campaign

The study found out that health facilities use the routine malaria data and information to strategise the community mobilisation and sensitisation campaigns to reduce malaria infections and deaths. Knowing the area where most malaria patients are located could help the facility narrow down the area of concertation when designing or implementing malaria prevention interventions or measures. Through data abstraction from DHIS 2, the study noted some facilities with high prevalence rates of malaria. These facilities with high malaria cases were asked how they use malaria data to plan for preventive measures. It was revealed that when the facility figured out that a specific community have high cases of malaria, then it was the responsibility of the facility to planning for sensitisation campaigns in the respective community with high rates of malaria prevalence. These mobilisations and sensitisation campaigns were conducted through village meetings where HCWs provided preventive education like encouraging communities to use insecticide nets, seeking medical attention when they feel any symptoms related to malaria, and keeping



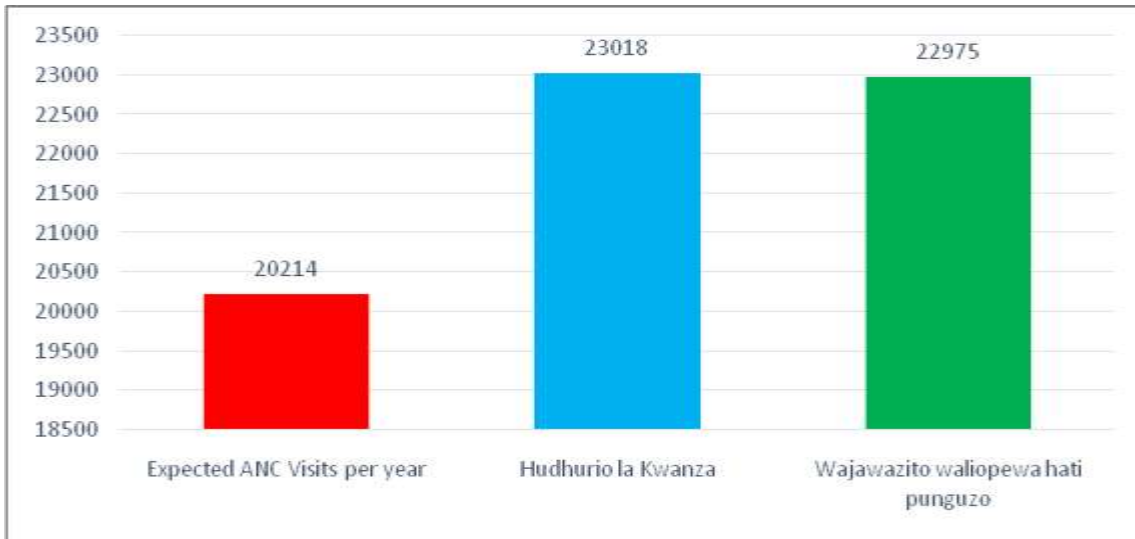
their environment clean. This was captured during the interview with the facility in charge from Buhingu HC;

*"...we use data to identify communities with a high prevalence of malaria cases and arrange for community mobilisation. We have been using this approach to reduce misconceptions about malaria preventive measures among the local communities. One of the misconceptions we have encountered is that prolonged use of LLIN affect the ability of reproduction system in the long run..." (IDI with facility in-charge from one health facility).*

Also, at the CHMT level, it was observed by the study that they use malaria data to support the implementation of preventive measures in the community. For instance, during the interview with one member of CHMT, it was noted that they use routine data to ensure that maternal and under-five children are provided with free insecticide nets. The following narration eloquently captured this;

*"...we have employed this approach of community mobilisation and sensitisation campaign to provide education to communities about the importance of maternal to use the insecticide nets they have been provided from facilities. This has been done through a community radio station called radio Kwizera..." (IDI with one CHMT member from Uvinza DC)*

Reflection on the above findings, it is worthwhile that routine malaria information and data, when are adequately used from the facility level, can help to identify the area where there are high rates of malaria prevalence or the more exposed community or in most danger of malaria diseases and act accordingly to control or prevent mortality resulted from malaria. In the same vein, the secondary data from DHIS2 showed how health facilities found at Uvinza district have been using the malaria data to distribute Long-Lasting Insecticidal Nets (LLINs) among pregnant women expected to have their first Antenatal Clinic (ANC) visit. See Figure 4.2 below;



**Figure 4.2: LLIN Distribution for 2020 ANC Visits, Uvinza DC**

**Source:** DHIS2 (2021)

The above figure shows the health facilities use the malaria data for decision making. From the figure above, it is clearly shown that Uvinza DC expected to have 20,214 ANC visits during 2020. Using such data, the facilities, in collaboration with CHMTs, had to make the informed decision in requesting and distributions of LLIN among pregnant women to reduce malaria cases among pregnant women. Thus, without having the data, it might become difficult for both health facilities and CHMTs to plan the distribution of LLINs. Based on this view, it is therefore imperative for this study to argue that HCWs are using malaria data for the informed decision making.

#### **4.4 Technical Factors Influence HCWs' Capacity to Analyse and Use Data**

The following section responds to the study's first objective, which aimed at assessing technical factors associated with the use of health information for decision-making among HCWs located in the Uvinza district. The study revealed at least two main technical factors related to the routine use of health information and data. These factors include; data management and analysis skills, knowledge on malaria indicators. In the proceeding subsections, these factors are presented and interpreted in details.

#### 4.4.1 Data Management and Analysis Skills

It was unveiled by the study participants, mainly district malaria focal person and DRCHCo, who claimed that there is poor usage of the malaria data at the facility level, which is associated with a lack of data management and analysis skills. The findings indicate that the available HCWs at the health facility level are not well trained in data management processes, analysis and data use. The majority of the study participants reported that they do not have data management and analytic skills to produce reliable information. It was noted that most capacity-building pieces of training related to data management and analytics skills are conducted by external technical partners. The below excerpts captured during IDI with one of HCW from Kandaga Dispensary summarise this finding;

*"...I never attended any training, and I do not know even how to draw a simple chart or table. I think even my colleague has no idea on how to consolidate data and represent them in the graph or charts..." (IDI with one of a nurse from Kandaga Dispensary).*

Insufficient knowledge of data management and analytic skills among HCWs hampers health data and information for decision making. It was expected that the purpose of HCWs to gather routine health data and information was to get the complete picture of the kind of services they are offering to the patients and community at large. Nevertheless, a proper analysis skill is necessary to understand such a picture, yet only a few had such knowledge. However, it was found out that HCWs are relied mainly on the facility's data officers and statisticians to help analyse the data.

Another observed scenario related to a lack of data management skills and little knowledge on how it is essential to adhere to data completeness. In other words, today, most service providers do not comply with data management principles such as completeness of the data when recording patients information in the *Mfumawa Taarifa za Uendeshaji Huduma za Afya* (MTUHA) books/registers. Through observations, the study noticed the incompleteness of data elements in registers, as some of the entries in registers lacked key client's details such as sex or age. In this case, the study is in the position to argue that the HCWs have little knowledge of how to observe and comply with data management and

provide data quality. One health facility in charge had the following comments on staff skills and knowledge on data management.

*"...Majority of the health facility services providers had never attended any training on either data quality or data management process". They are not skilled in data analysis and the overall aspects of the data management process. It is difficult to get quality data from them...."* (**IDI with a health facility in charge from one health facility**).

In support of the above comment, during IDI with HMIS focal person, he reported that data submitted to the district level from health facilities usually are low quality. Before they conduct any further analysis, they first need to conduct data cleaning and sometimes re-check back with the health facility to validate the incorrect data before deciding, policymaking or planning at the district level.

#### **4.4.2 Knowledge on National Malaria Indicators**

In order to have total usage of malaria data and information for decision making, knowing of standardised or national malaria indicators is pivotal as it will help the facility and other stakeholders to assess whether they are making any progress in the delivery of the healthcare services. By saying so, the study was eager to know whether HCWs were familiar with national malaria indicators, which could help them make an informed decision on how services are provided in the facility and influence public health policies. In this regard, the study's findings revealed that most HCWs knew national malaria indicators, which are monitored at the facility level. Despite this, most of them do not regularly use them for decision making at the facility level; instead, they submit such indicators to the higher level, i.e. district level.

Another surprising finding was that some HCWs were unsure how data analysis or computation of reported malaria indicators is done. During the interview, HCWs tried to provide different explanations on how the data are analysed. However, most of them were unclear and failed to explain precisely how the data analysis is done based on key data elements. Also, some failed to mention the exact data sources for analysing the indicators. This was because they relied on data officers and statisticians for data analysis. This can be viewed from the below statement;

*"...most of the nurses are not aware of the knowledge on how to analyse and interpret the malaria data. For example, analysis of the indicators sometimes is confusing. That is why at some point, you may find the report submitted by the provider to CHMT are inconsistent with what is found in patients registries. In this regard, you may find out that providers are relying on data officer to analyse the facility data and information..." (IDI with one nurse from Kandaga Dispensary).*

The study further wanted to know which key malaria indicators are computed and used at the facility and district levels. For instance, it was observed during the interview with the district malaria focal person that; malaria indicators such as the number of people tested for malaria; malaria testing rate; malaria positivity rate; malaria burden indicators; and Malaria Service and Data Quality Improvement (MSDQI) indicators have helped the district to the improved access to quality Malaria Case Management (MCM) by strategically use the data to make a decision especially in logistic supply. For instance, the following was narrated during the interview with one member of CHMT;

*"...the data submitted by health facilities monthly helps the CHMT to make informed on several interventions. For instance, when it comes to the request of malaria commodities, we usually used the available data to request the Medical Stores Department (MSD) through RHMT..." IDI with one CHMT member from Uvinza DC).*

This is supported by secondary abstracted from the DHIS2 whereas, tracking of malaria data help health facilities and CHMT, in general, make an informed decision on improved malaria service provision. For instance, data related to malaria burden and the stock of malaria commodities helps the health facilities and CHMT strategically evaluate their capacity to utilise malaria commodities. In other words, this is to say, how many malaria commodities were received by the council or health facility at a particular time; and what amount of the stock has been dispensed to malaria patients over time; and what is the stock balance of the malaria stock before requesting another stock. Table 4.2 shows the availability of malaria commodities in the Uvinza district during 2020.

**Table 0.2: Uvinza DC - Malaria Commodity Stock Report 2020**

Commodity	Unit	Quantity				
		Balance at begin	Received	Issued	Lost	Balance on hand
ALU Stocks: 12s (Blue)	Strips	25700	6350	8246	538	23089
ALU Stocks:18s (Red/Pink)	Strips	29867	7093	7598	1057	29528
ALU Stocks: 24s (Green)	Strips	98551	46508	19928	8558	127750
ALU Stocks: 6s (Yellow)	Strips	62568	13327	13892	1179	61351
Artesunate Stocks	Strips	26216	15756	14354	2042	28376
Quinine Injection Stocks	Ampoule	5212	560	1526	308	4035
Quinine Tablets Stocks	Tablet	31079	7801	6405	60	32166
Sulfadoxine/Pyrimethamine	Strips	561927	9941	69670	7275	475528
mRDT Stocks	Tests	374864	59970	87159	12282	340155

**Source:** DHIS2 (2021)

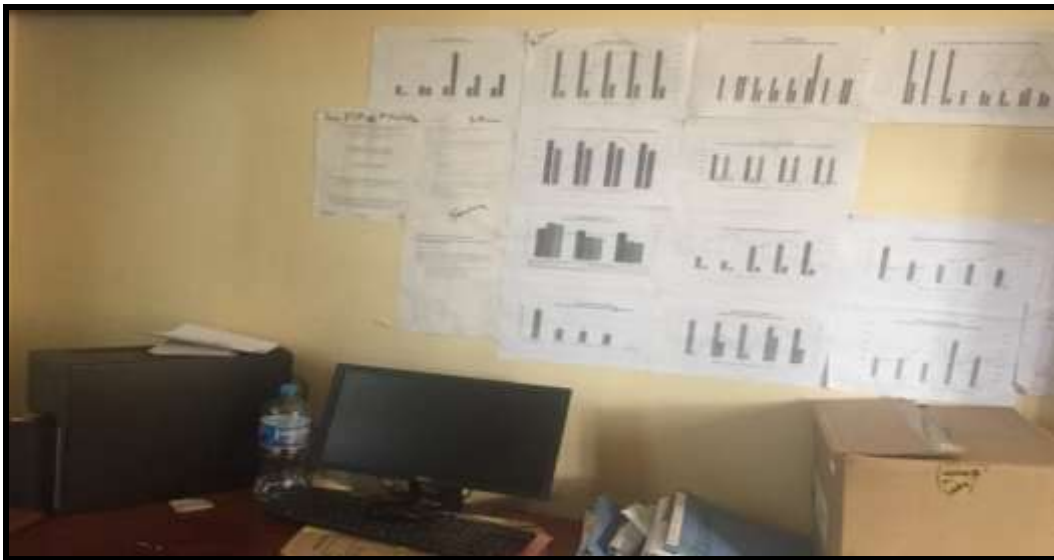
The results from the above table imply that when CHMT wants to request malaria commodities for 2021, they will have to look at the data of the available or balance at hand commodities, thus after knowing that data, they will make the informed report and request of the essential malaria commodities according to their needs.

At the facility level, the study's findings showed that most HCWs are knowledgeable on the existing malaria reports. In contrast, others were aware of some of the indicators as they are being trained from time to time either through formal training and scheduled supportive supervisions. One of the HCWs commented the following;

*“...in most cases, let us say every month were are being visited by expertise from CHMT or RHMT or other stakeholders who are come and provide us with supportive supervisions. We can be taught different malaria indicators during those visitations, like collecting their data elements and computing the indicators. Moreover, on how we can use those indicators for quality improvements of malaria services...” ((IDI with one nurse from Uvinza HC).*

Generally speaking, these indicators are usually used by health facilities for monthly performance monitoring and their clear understanding of significant importance to data officers and HCWs. During the interview with HCWs, it was revealed that it is mandatory for them to monthly compute the malaria indicators and submit them to CHMT through DHIS2. This requirement of monthly submission of malaria indicators compels HCWs to gather and use the malaria data and information routinely.

Additionally, the study was particularly interested in documenting malaria data analysis and use in the health facilities to display graphs and charts on the facilities either in the notice boards or inside the office. From the study observation of the displays, it was noted that at least seven out of nine visited health facilities displayed the malaria indicators after analysing them. The exciting finding was that facilities that did not display malaria data were all dispensaries, namely Kandaga and Heremebe. The articulate reason for not displaying the data was the lack of printing equipment, i.e., the printer. See Figure 4.3, which show graphs and charts of malaria data and indicators displayed at facility settings.



**Figure 4.3: Malaria Data Displayed at Nguruka Health Center**

**Source:** Field Observation (2020)

It was, however, revealed that some of the HCWs did not see the importance of displaying data on noticeboards or facility walls because the data are already displayed into DHIS2, where there are graphs and charts. Moreover, HCWs said that typically most patients are not so interested in following what has been displayed on the notice, especially if graphs and charts show the trends of disease, like malaria. It was also revealed that patients are more interested in following the advertisements presented on the noticeboards.

#### **4.5 Organisational Factors Influence HCWs' Capacity to Analyse and Use Data**

This section presents the findings and results of the study related to organisational factors that influence routine health information. It is important to note that the successful use of routine malaria health information also depends on several organisational factors. Specifically, the section is subdivided into four sub-sections that present different organisational factors. They include; type of health institution, number of HCWs, supportive supervisions, information use culture, and data collection and reporting tools.

##### **4.5.1 Type of Health Institution**

The findings of this study showed that the type of health institution sometimes determines the routine use of malaria health information and data. For instance, the capacity of using data and information was different from dispensaries, health facilities and hospital. Also, the number of malaria patients' that the facility receives per month help to determine the use of the health information and data. The use of routine malaria data and information were reported to increase as the level of health institution increases, i.e. from dispensaries to health centres to hospital and district level. Health information and data were reported to be low in dispensary than other facilities; this was somehow attributed to how these facilities gather and report the data to the next level.

The study established that most facilities are mainly gathering data and report them to the district level. In contrast, only a few health facilities have dedicated themselves to using the data to improve healthcare services. This could be justified from the narration made by one of HCW from Ilagala HC, who said the following;



*"...I would not say that we adequately use malaria data for decision making, but we try our best. For instance, we have weekly data review meeting and quality improvement meetings. We assess ourselves on what we have achieved during these meetings based on the targets that we have set as the facility. For instance, there was a period when we wanted to ensure that we reduce malaria infection to maternal and under-five years. So, we used data from the RCH clinic to identify all those maternal who do not have insecticide nets and provided them with one. Without such information, it would be impossible for us to make such a decision..." (IDI with RCH focal person from one health facility).*

Another HCWs commented the following;

*"...yes, at our facility, data usage is the main focus. We use data to plan our monthly activities and strategies to ensure we attend to all expected patients. We also use the data to assess the progress we made in eradicating malaria infections in our catchment areas..." (IDI with facility in-charge from one health facility).*

Inconsistently, one HCWs from Mwakizega dispensary added that reporting malaria data to the next level and not using them for the decision making at the facility level was the norm;

*"...most of our service providers, especially those who are recently employed, believed that they are collecting data for higher-level officials. Also, there is this tendency from health providers of remember to review their data only when it is around reporting period..." (IDI with the facility in charge from one health facility).*

At the higher levels, i.e., CHMT, the officials depend on the data found in the DHIS 2 system. The data from all health facilities are aggregated and reviewed and entered into the DHIS 2 system. It was revealed by Uvinza DC malaria focal person and HMIS focal person that they highly depended on malaria health information and data. However, there was a concern raised by the Uvinza DC malaria focal person, who reported that data is of poor quality; the researcher was told that these data are re-checked and validated quarterly before being authorised to be used. The below quotation summarises this finding;

*"...data from health facilities are not of good quality. There are data with many inconsistencies/mismatch between tally sheets, registers, and monthly summary report. Even if you compare monthly summary reports of specific health facilities and data entered in the DHIS 2 system, there the possibility of getting data inconsistencies is very high..." (IDI with CHMT member from Uvinza DC)*

Based on the above findings, it is fair enough for this study to argue that most health facilities did not consider themselves to have ownership of the data. Most health facilities reported gathering the routine malaria data and information because they are supposed to do so and submit them to CHMT. Due to lack of ownership, most HCWs believed that they are not responsible for using data; instead, they are responsible for collecting and reporting to the next level. One HCWs commented the following;

*"...here at this facility, we normally gather using patients' registries and tally the data only basis using reporting forms and submit the report to the district level, no any other way we use data in this facility..." (IDI with one nurse from Nguruka HC)*

The implication of the statement above is that, as long as HCWs do not have ownership of the routine data gathered, they will not put much efforts to ensure the quality of data gathered, let alone the usage of such data. Thus, in order to successfully influence routine use of malaria data and information by HCWs for decision making, then deliberate efforts or strategies should be geared towards capacity all types of health facilities to see the importance of data and encourage them to use it for their day to day planning, such as allocation of human resources or procurement of drugs and other medical equipment and supplies.

#### **4.5.2 Number of Healthcare Workers**

Workload due to staff shortage and the incompetence of available service providers is one reason that influences the use of malaria data. Generally, the study found out that most of the health facilities have inadequate HCWs. With such a low number of HCWs, it becomes difficult to routine use and consistently collects health information and data.

*"...We are swamped in this health facility; sometimes, I moved from one department to another to assist other service providers and forget to record the patient's information in the registers..." (IDI with one of the nurses from Kandaga Dispensary).*

Another study participant added that they do not use malaria data for decision making every time due to understaffing at respective facilities and workload, i.e. too much paperwork related to data recording and reporting. The study noted that the health facilities have many patients, and among them are very sick and need immediate medical attention. Severe patients who need medical attention sometimes make the nurse start to treat patients and stop or ignore to record the patient's details in the register. One of the HCWs commented the following excerpt;

*"...Workload and understaffing are among the things that hinder nurses not to concentrate in recording the data and use for decision making..." (IDI with facility in-charge from one health facility)*

Due to the lack of enough HCWs, some facilities delay monthly analysis and reporting of malaria indicators to the district malaria focal person. In turn, this might lead to delay in planning and budgeting for malaria healthcare services.

#### **4.5.3 Supportive Supervisions**

The findings of the study revealed that supportive supervisions were provided to HCWs, and such supervisions are, in fact, of significant importance to influence the use of routine malaria data. It was noted that it gave HCWs the courage and capacity building to facilitate problem-solving behaviours through supportive supervision. Equally important supportive supervisions focused on monitoring how the facility performs towards the established national malaria indicators. Moreover, the study asserts that regular supportive supervisions used the routine malaria information and data for decision making and formulate the agreed action plan to be implemented by the health facilities. Simply because during such visitation, different data elements from source or reporting documents are assessed to ensure their reliability and validity. The statement below entails the role of supportive supervision concerning the routine use of malaria data and information among HCWs;

*“...from what I understand is that supportive supervision assists us as the facility to come with an action plan to improve the quality in terms of validity and reliability of our data, which are very significant in ensuring that we have appropriate informed decision making either at the facility level, district level of national-level...” (IDI with one of the nurses from Uvinza HC).*

Along with the above explanations, another respondent had a following say;

*“...to my knowledge, I may say that through the continuous supportive supervision we are providing to health facilities, they become more alert on ensuring that they regularly review malaria data and use them to assess their performance based on the action plans of the previous supportive supervisions...” (IDI with CHMT member from Uvinza DC).*

With such statements, it suffices this study to argue that HCWs are more accountable and responsible to ensure that the health facility data are of high quality so that, when they are exposed to supportive supervision visitations from their superior it maybe the member from CHMT or any other partner, whom also leave action plan for HCW to follow.

Just to further cement the role of supportive supervision about data use. More insights were generated by the study, whereas HCWs reported that supportive supervision such as Data Quality Assessment (DQA) was a help to identify gaps in the delivery of services. At the same time, it provided an action plan for improving malaria delivery services to clients. This can be summarised by the following statement from one of the HCW from Buhingu HC.

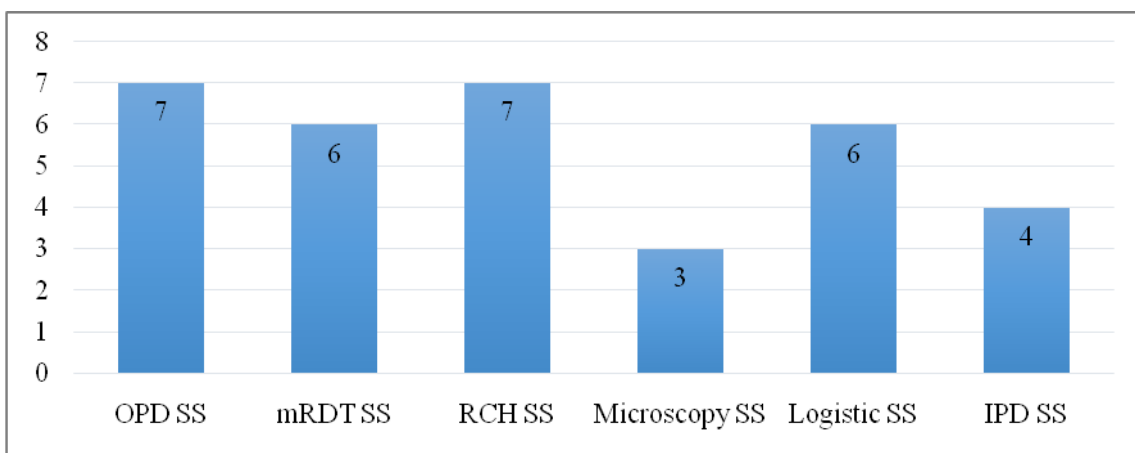
*“...we regularly received the supportive supervision from CHMT and through these supervisions, they act as a platform for us to conduct data quality assessment of different source and reporting documents which will help to improve the quality of the data we are supposed to submit and use for decision making...” (IDI with one of the nurses from Buhingu HC).*

In concomitant to the above statement, the study observed facility documents that capture the number of supportive supervisions; such documents included visitor's registration counter-books, while some facilities were found to have a dedicated book for supportive

supervisions with action plan templates. These documents were observed to contain many stakeholders who provided supportive supervision to HCWs across the visited health facilities. It was noted that the majority of visited health facilities received regular supportive supervisions, most likely quarterly from RHMT or CHMT. In contrast, supportive supervision from other stakeholders like implementing partner of the malaria program provided supportive supervision on an occasional basis.

The secondary data from DHIS2, as presented in Figure 4.4 which show the number of supportive supervision visits carried to the 8 studied health facilities in Uvinza by CHMT during 2020. These supportive supervision visits were carried to promote MSDQI while using the routine malaria data collected by the facilities.

**Figure 0.4: MSDQI Supervisions in Uvinza Studied Facilities, 2020**



**Figure 4.5: MSDQI Supervisions in Uvinza Studied Facilities, 2020**

*SS=Supportive Supervision*

**Sources:** DHIS2 (2021)

The above figure shows that CHMT is conducting supportive supervision to health facilities across different malaria projects. The supportive supervision implies that it enables health facilities to use the gathered data and decide how to improve malaria services. Conclusively, the supportive supervision acts as a factor to influence the routine use of malaria data and information among HCWs for decision making, as the supervisor used the available data to evaluate HCWs and provide them with feedback for

improvements. Based on such findings, the study is therefore ascribed that, when there are adequate and regular supportive supervisions to health facilities, it helps to shape or infiltrate the culture of information use to uphold data quality and consistent use of data for the decision making such as planning and budgeting of malaria healthcare services and interventions.

#### **4.5.4 Culture of Data Use**

The findings of this study revealed that information use culture is another factor that might influence the routine use of health information and data for decision making among HCWs. A data use culture describes the customs, dispositions, and behaviours of a particular group or organisation to support and encourage the use of evidence, including facts, figures, and statistics, to inform their decision-making (Arenth et al., 2017).

During the interviews, study participants reported, they have accustomed to different culture of data use. Some data use cultures were found within daily data gathering and monthly reporting of crucial malaria indicators. Moreover, the data were frequently used in planning and budgeting for malaria commodities. This was captured during the interview with one of HCW from Mwakizega dispensary, who shared the following excerpt;

*"...what I would say is that this process of data collection and use has become like part and parcel of our working behaviour. We now know that we have to report our progress to the district level monthly. More importantly, we normally rely on data to planning for malaria prevention intervention, but also we use malaria data for periodic procurement of malaria commodities. This has to influence has to monitor and evaluate our data and performance from time to time..." (IDI with one of the nurses from Mwakizega Dispensary).*

The study found that using malaria data is also embedded during Quality Improvement (QI) meetings held weekly, monthly, and quarterly by health facilities and CHMT. This was evident when the study wanted to know how HCWs use information culture for decision-making. The following were some of the responses directly from the study participants;

*"...in our facility, we usually tend to conduct weekly and monthly data review and QI meetings to track the progress of targets we set to reach. For instance, targets related to the distribution of LLIN or IRS. Also, we use these weekly and monthly meetings to assess the gaps and where we are not performing well so we can develop strategies for improvements..." (IDI with facility in-charge from one selected health facility).*

The findings show that through series of QI meetings at the facility and district level, malaria healthcare services improvements and modification of data collection and reporting tools were modified. This view was received from another participant who commented the following:

*"...initially, we had poor quality of data submitted to the district. Because we did not know to emphasise inputs and feedback from QI meetings and data review meetings. They were just meetings to us, but after started to have close follow-ups and increase the attention of weekly QI meetings at the facility level. It helped us improve the quality of the data we submit to the district level, which is then used for planning and budgeting. Nevertheless, also, providers started to see the value of data and the importance of using such data for planning..." (IDI with facility in-charge from one selected health facility).*

Additionally, during the interview with DRCHCo and the district malaria focal person, it was noted that, at the district level, there is a positive culture of quality data review, which is conducted quarterly and annually. However, due to a lack of funds to organise data review meetings or conduct them regularly, data was collected and reported to a higher level. Transferring data without being validated can mislead policy and decision-making when using this kind of data.

Therefore, the study established that information use culture is shaped by institutional regulation and requirements. All health facilities must report each month on the malaria indicators to the district level. This help to influence HCWs to routinely assess their monthly data before submitting them to the district malaria focal person, then uploading data from health facilities to DHIS 2. With such, culture helps make the timely availability of malaria data and information for the informed decision making.

#### 4.5.5 Availability of Data Collection and Reporting Tools

Another notable organisational factor is the routine use of health information and data as data collection and reporting tools at the respective health facilities. Undoubtedly, for HCWs to be able to the routine use of health information and data, such data are supposed to be found or stored somewhere. With due regard, HCWs supposedly have the ongoing systematic process of gathering, analysing and interpreting the health information and data from various source documents. Generally, such a process helps construct a complete picture of malaria healthcare and build a foundation for decision making.

The findings of the study noted that health facilities have a systematic record-keeping system including; proper filing data collection tools such as registry including HMIS and laboratory registries for tested malaria patients. Also, the study revealed that there are reporting tools like monthly reporting forms that play a crucial role in facilitating the use of information found in those registries for reporting, data sharing, planning and resource allocations. However, it was noted that not all health facilities had proper recording keeping systems to enable easy retrieval of information and data which could be used for decision making.

Additionally, some facilities reported running out of reporting tools from time to time, mainly monthly summary forms. Also, most of the visited health facilities did not have data sharing tools/reports which could be openly displayed for other stakeholders and communities to see. During the interview with one of HCW, the following was pointed out;

*"...even though this does not happen to us now and then, but there is a time when we did have the data collection precisely patient cards. Additionally, I do remember that there was a time when HMIS registers were updated, but we did not get them on time..." (IDI with one of the nurses from Kandaga Dispensary)*

Another district malaria focal person added the following views;

*"...most of the health facilities have an indigent system of recording keeping the data. for example, you may find that, you want to retrieve the data of the past*



*previous months...but you to get those data is very hard due to misplacement of registers..." (IDI with CHMT member from Uvinza DC)*

Taking the above statements into reflections, the study ascertains that HCWs might have the technical knowledge and the desire for data gathering, analysis and utilisation, but in the absence of data collection and reporting tools, such knowledge and desire lost in vain. Thus, in this study, it was found out that, district malaria focal person was the one to issue the standardised data collection and reporting tools to health facilities. However, it upon HCWs to alert malaria focal person that they need data collection and reporting tools in the first place.

Nevertheless, most of the HCWs are simply use the available tools for gathering and reporting data to their superiors with the expectation that, those at a higher level are the one who needs to make the decisions and HCWs perceived themselves as just implementors of what has already being decided.

#### **4.6 Individual Factors Influence HCWs' Capacity to Analyse and Use Data**

The following section is addressing objective number three, which guided this study. The interest rested in understanding the individual factors which help to shape or influence routine use of malaria information and data among HCWs found in Uvinza DC. Thus, a series of question-related to individual behaviour in influencing routine use of malaria data and information. Some of the critical individual factors found by the study included; working experience, the position of HCWs in the respective health facility and individual behaviours such as attitude, motivation and values. Further presentation of these study is provided in the proceedings sub-sections.

##### **4.6.1 Position of Healthcare Worker**

During interviews with study participants, it was revealed that the position of HCW at some point help to determine their ability to use malaria data for decision making. It was noted by the study that HCWs are not given the knowledge on data collection and analysis in medical studies. Thus, most HCWs are not looking to engage in data collection and reporting activities. They only engage in such activities because they must report data to the district level unless they could focus on treating and providing healthcare services.

It was also noted that much focus on data collection and report means that they have to reduce the time to attend patients. Hence, data collection and reporting were somewhat considered for sorting of extra activity to them. This is why most health facilities were observed to have the late submission of malaria indicators to the district malaria focal person. This was narrated by one of HCW from Ilagala HC as follows;

*"...being a doctor or a nurse, we are not trained on data issues in medical schools. Therefore we are familiar and not very good. When I was appointed, the roles of data analysis and use was not clear to me. I come to learn it through partners during the meeting which we usually have. This make becomes very hard for us to start using the data. For instance, I am just a nurse who provides treatment to patients with malaria.... if I have to work on tally them is usually after working, especially when we want to submit the monthly report to district level..." (IDI with one medical attendant from Ilagala HC).*

Moreover, the study found out that facility in-charges were more likely to use the health information and data for decision making since they are part of the facility management team and are directly answerable to CHMT. Again, the roles of HCWs as far as malaria data are a concern helped to influence malaria data to use. It was observed that HCWs who are malaria's focal person of the facility are better positioned for the routine use of malaria information and data. Pharmacists and laboratory technicians were also found to use routine malaria data to monitor medical commodities and supplies, unlike other HCWs such as nurses and medical doctors whose role is centred on service provision only. This was confirmed by narration from a pharmacist from Uvinza HC.

*"...our department is mainly focused on dispensing of anti-malaria drugs and other medicine...therefore for us, it is very crucial to monitor the data on patients who have been dispensed to identify which drugs are running out of stock so we can start the process of requesting other stock. In this regard, I would say being a pharmacist it is unavoidable to deal with data analysis and using..." (IDI with Pharmacist from one selected health facility)*

The above findings imply that knowledge and skills for data processing, analysis, and interpretation were usually not given due attention to certain HCWs. At large, this affected their ability to use health information and data for decision making. Simply because some perceived that, based on the working position, they could not make any decision, with this in mind, they thought of themselves more as implementers and not planners or decision-makers. Thus, the gathering of malaria data was of no use to them. Many health facilities suffer from shortages of skilled people to manage, interpret, and use the data; and motivation and incentive to generate high-quality data.

Based on such findings, it is fair enough for this study to establish that HCWs provide healthcare services as their primary focus and data collection, analysing and reporting as the second focus. Much more important, the higher the position and the roles HCWs in the facility increased the likelihood to use data malaria for decision making.

#### **4.6.2 Behaviours of Healthcare Workers**

Behavioural factors such as attitude, motivation and values hold by HCWs; are significant in influencing and demanding data use. Therefore, the study asked participants to describe and explain different behaviours that influence them to routine use malaria information and data at the facility level. The study's findings noted that most HCWs had a poor attitude despite being given training on data collection registers and reporting. Poor attitudes such as perceiving data collection as a useless activity or waste of care provider's time also hinder malaria data usage among HCWs. Also, as identified in the previous sub-section, most HCWs thought of routine malaria data collection, analysing and reporting as their second focus; before providing services, most of them had a poor attitude towards the use of data. More importantly, the study revealed that they expected to get motivations and incentives to generate high-quality data. The narrative below captures this reality;

*"...I do not understand my roles and responsibilities in data collection and its management, why do we collected all this data, it seems to be useless as it only for reporting,.....we are not oriented on how to analyse and use it and therefore less value and interest to collect quality data, filling and updating many tools of which no one makes use of the data.... lack of motivation plus demand for quality data*

*use in routine decision making..." (IDI with one of the nurses from Kandaga Dispensary).*

Another HCW added the following comment;

*"...this process of collecting data and reporting them sometimes is very tiresome to use...you find that we have many patients to attend to at the same time malaria focal person is demanding you to submit the data. The main response of nurse and doctors is to provide healthcare services to patients and not to collect data...even when we use our extra time to compile the report or when we are called to attend the meeting for data review. We are not given any allowances or motivations. This is why some providers do not prioritise having quality data..." (IDI with one of the nurses from Mgambazi Dispensary).*

The findings above imply that behavioural factors gave crucial insight into how HCWs and members of the CHMT routine use malaria data or failed to do so. For example, as mentioned earlier, most HCWs thought their primary roles and responsibilities revolve around service provisions and malaria data collection, analysing and reporting as their secondary roles and responsibilities. With this mindset, even if HCW is provided with technical and organisational capabilities to use malaria data will still not adequately use the data. This is so because the willingness and desire for data usage emerged from within the individual. In other words, this can be portrayed through analogy which states that you can teach people the technics to do the task and provide them with all the required resources to achieve the desired result. However, not all people meet the expectation of such a task simply because they are unwilling or motivated to do so. To put this analogy into the context, this is to say that if expectations concerning the use of malaria data are unclear to HCWs at all levels of the health facilities, their motivation and commitment to making informed decisions based on malaria data could suffer.

#### **4.6.3 Working Experience**

Lastly but equally important, it was revealed during data collection with study participants that, working experience of HCWs is another individual factor that could somehow influence the use of malaria data. The length HCWs have been employed or working in a specific facility will help shape the attitude, motivation, and practice of that HCW into

using data for decision making. This is, however, attributed or contributed to the availability of technical and organisational factors; for instance, HCWs with longer experiences are expected to be exposed to the number of technical data management and analysis training, capacity building through the number of supportive supervision, increase awareness on particular data elements and standardised indicators. However, they might also be more aware of the importance of data use for decision-making than their counterparts. The below excerpt confirms this;

*"...sometimes the use of data depends on health providers themselves, in some cases, providers who have worked for a long period in this facility are more reluctant to timely collect and share the data, let alone using the data. Some other providers with extensive experiences are the ones who show a good example when it comes to data use.... when it comes to newly providers, most of them lack the know and experience on how to collect and use data for decision making..." (IDI with facility in-charge from one of selected health facility).*

In due concern as per the working experience of HCWs, it was noticed from the study that participants who are newly employed HCWs have somewhat the probability of not using malaria data for decision making. Therefore, in order to make them use the data, it is of necessity for the facilities to be structured in a way that capacitates them through on-job pieces of training, but also infiltrate the culture of valuable information to them so as they can start to value the use of data in different decision making at the facility level.

#### **4.7 Chapter Summary**

The findings presented above depicts that, in order for HCWs to have the capacity to analyse and use malaria data for informed decision making, multiple factors can influence that. For instance, the chapter revealed that a lack of data management and analytics skills from HCWs results in low-quality data, subsequently hamper the usage of such data and information for proper decision making. Also, availability of data collection and reporting tools, type of health facility, number of HCWs, supportive supervisions, the culture of data use, position, working experience and behaviour of HCW. All of these factors are somehow contributing to the capacity of HCWs to use malaria data. Moreover, the study noted that routine malaria data are used to make an informed decision such as;

improvement delivery of quality of malaria services, resource allocation and procurement of malaria commodities, evaluation of facility performance but also, planning for malaria prevention intervention such as community mobilisation and sensitisation campaign on LLIN and IRS.

## CHAPTER FIVE

### 5.0 DISCUSSIONS

#### 5.1 Introduction

This chapter discusses the critical study findings presented in the previous chapter concerning empirical results from other studies conducted on the same topic. The chapter is mainly made up of six sections, including the introduction. Section two discusses the usefulness of malaria data for decision making. Then, sections three, four, and five discuss the findings related to the three objectives that guided this study. At the same time, the last section offers a summary of the chapter.

#### 5.2 Routine Use of Malaria Data

The study sought to understand the factors influencing HCWs' capacity to analyse and use malaria data for decision making. It was of paramount importance for this study to establish how malaria data is being used for decision making. It was noted that the routine malaria data generated by HCWs is being used in different aspect of delivering health services. Some of the highlighted usefulness of malaria data are; improving the quality of services, resource allocations, providing feedback on facility performance, community mobilisation and sensitisation campaigns. The implication of these is that malaria data helps HCWs ensure that health services are done according to the planned standards and promptly. For instance, the study observed that HCWs use malaria data to promote quality improvement of the service delivered. The underlying assumption here is that HCWs use the malaria data to make an informed decision at the facility level.

The same results were documented by Simba and Mwangi (2005); they noted that malaria data are effectively utilised in doing the planning to improve the delivery of health services within the health facilities found in Kinondoni municipal, Tanzania. Similar results were captured by (Ahanhanzo *et al.*, 2014; Ohiriet *et al.*, 2016; Standley *et al.*, 2018; Okello *et al.*, 2019), who established that the health facilities used malaria data to make informed decision and planning for quality improvement as far as the provision of health service is concerned and procurement of malaria commodities. For instance, Standley *et al.* (2018) showed that data-supported pragmatic decisions about implementing a public health

response resulted in a significant increase in the efficacy and cost-effectiveness of disease control.

This study also observed that malaria data is being used for planning for resource allocation, such as allocation for human resources for health and procurement and allocation of health commodities and equipment. The underlying assumption here is that when health facilities have malaria data, they can decide on procurement of the commodities as per the need. However, also, the malaria data can assist in the allocation of HCWs to attend malaria patients.

These findings have concurred with the study by Ohiriet *al.* (2016), which was conducted in Nigeria– and it was revealed that the routine data in malaria program were used by health facilities in supply chain management, particularly for forecasting minimising stock-outs of malaria commodities and equipment. For instance, the routine data enable facilities to periodically track the number of malaria drugs and mRDT kits used by the facility.

Another documented usage of malaria data was based on the provision of feedback through performance evaluations. This implies that when there is systematic data collection, analysis and dissemination, it gives the HCWs and the facility a chance to understand the progress of malaria services being offered and show the burden of malaria disease within the facility catchment areas. This gives the facility the power to assess their progress and failure in curbing and controlling the disease. For instance, the data facility could know the number of pregnant women and under-five children distributed with LLIN or the number of households reached through the IRS.

Likewise, Ashton *et al.* (2019) showed how routine HIS data is used to evaluate the impact of malaria control interventions in Zanzibar, Tanzania. Their study revealed that the data gathering enabled the intervention to track performance by comparing it with the baseline data. The malaria data helped the programme know that a significant number of people have been distributed with LLINs distributed. With this data, it was easy to establish the performance of malaria intervention. It was revealed that there was a rapid decline in malaria incidence in Zanzibar as a result of the implemented intervention.



Again, the current study found out that HCWs have used the malaria data to determine which areas need community mobilisation and sensitisation campaigns. For example, in malaria prevention intervention, the data can show a high burden of malaria disease and plan to curb the disease.

The usefulness of the data in planning of community sensitising campaign was also revealed by Kitojoet *al.* (2019), who conducted the study in Tanzania; and Ghilardiet *al.* (2020), who had their study in Kenya, Malawi and the DRC had the same view as the findings observed in this current study. In their studies, it was noted that the availability of malaria data, such as the number of children and maternal infected with malaria, help to analyse the existing malaria burden among under-five children and maternal to suggest a preventive intervention to address such burden. The preventive intervention aimed to increase awareness among community members of the risk factors associated with malaria, such as sleeping without insecticide net and unclean environments, i.e., bushes and stagnant water surrounding the households (Afoakwahet *al.*, 2018). Also, Aleganaet *al.* (2020) argued that routine data had been used to map the variation in treatment-seeking behaviour among children across Africa using household survey data on the actions taken for fevers reported by carers over the last 14 days. With such information, campaigns have been waged to educated communities that not every fever is malaria, so they need to stop seeking treatment from the pharmacy or home remedies. However, instead, they should seek medical attention from health facilities.

### **5.3 Technical Factors Associated with Use of Health Information**

Generally, the study presented different technical factors that determine the ability of HCWs to use routine malaria data for decision making. They include; inadequate data management and analytic skills among HCWs which is attributed to a lack of technical training and capacity building. Also, Mpofu *et al.* (2014) found out that, in Botswana, HCWs involved in systematic data collection had limited knowledge about analytical skills and reporting writing, which support the utilisation of data in malaria program. The study established that most HCWs are not using health data and information for decision making mainly because they lack these skills. Hence they cannot analyse the routine data either use them.

In some cases, the study established that HCWs relied on health facilities' data officers and statisticians to manage and analyse the data. They claimed to have data management and analytics skills are not taught to them at medical schools. Due to this, they do not consider data management and analysis part of their role and responsibilities but rather an extra activity that is not necessary to be mastered. Inconsistently, Okello *et al.* (2019) found that support workers such as data officers used for routine data gathering lack analytical skills and knowledge to ensure effective utilisation of health data. This study argued that HCWs and non-HCWs particular data officers could not fully implement routine malaria data in health facilities. This affects the quality of routine data obtained from health facilities, and its effect stretches to poor decision making and planning. Mboera *et al.* (2017) reported that when insufficient data are being used to analyse and plan for health management, it creates a health burden. For instance, poor data gathering of data related to the number of patients results in an inadequate supply of drugs and equipment stocks to the facility.

Again, the study noted that knowledge of national malaria indicators is fundamental to determine the probability of HCWs in using the malaria data. In terms of this factor, the study established that when HCWs knows what they contribute towards the big goal of the nation, which is measured through the specific standardised national indicators, it helps to increase their chance of using the malaria data daily. However, the study noted that not all HCWs are aware of agreed national malaria indicators; at least some know them but lack the knowledge on how to compute or analyse them. Another surprising finding related to national malaria indicators was that HCWs were aware and knew how to analyse the standardised malaria indicators, only to submit them to the next level, i.e., CHMT, but not for their use at the level of health facilities. These findings go against the findings observed by Okello *et al.* (2019), who found out that HCWs had little understanding of the indicators as they were developed at the national level by managers who were perceived to be oblivious to the service delivery or data collection and reporting realities on the ground. These managers at the national level used their power over the process to decide on indicators, data collection tools, and data collection procedures that HCWs at the frontline were required to adhere to when collecting and recording data. In this regard, some HCWs are collecting the data without actually knowing the purpose, thus resulting in poor collection and usage of data.

#### **5.4 Organisational Factors Associated with Use of Health Information**

Among the reported organisational factors influencing routine data analysis and use among HCWs were the type of health facility, number of HCWs available at the facility, supportive supervisions, the culture of information use, and the availability of data collection and reporting tools. Specifically, the study noted that the type of health facility determines the capacity of HCWs to analyse and use data. For instance, the study observed that most HCWs found at the hospital and health centres studied at Uvinza DC frequently analyse and use malaria data compared to those found in dispensaries. In contrast, Shiferaw *et al.* (2017) revealed that the odds of health information system utilisation were lower among health workers at hospitals when compared with those at primary health care units, i.e., health centres and dispensary. This might be due to close attention paid by the government to primary health facilities by providing supervision and regular feedback. Also, Dagnewet *et al.* (2018) noted that hospitals had poor utilisation of routine health data compared to the health centres.

Based on the above discussion, the current study has therefore established that type of the health facility does not necessarily influence the use of routine health data. However, hospital and health centres are provided with several capacity buildings, supervisions and a high number of HCWs who can have a good distribution of role and responsibilities, including; the routine data collection and reporting for decision making, unlike dispensaries where there are inadequate staffs to carry all the activities related to the provision of health services and at the same need to collect and report routine data.

Consistently, the study established that having an adequate or inadequate number of HCWs could also determine the rate of HCWs to analyse and use routine data gathered for decision making. This is because the facility with a low number of HCWs, in most cases dispensaries, find it hard to distribute task both clinical and non-clinic activities like routine recording and analysing of patient's data and information, especially when they have a significant number of patients to attend to at a particular moment. The shortage of human resource for health was also revealed in the study by Okello *et al.*, (2019) when assessing factors influence routine data use in Kenya. This study found out that, due to the limited number of HCWs, it was difficult for them to gather and utilise the routine data

adequately. Furthermore, the poor use of routine data among HCWs was associated with the roles attached to them.

In contrast, they argued that the primary role of HCWs is to provide health care and services to patients, and routine data gathering was more likely the dual role to them. In this regard, you may find out that HCWs only collect, analyse, and use patients' data when they get time. As far as this statement is concerned, the priority to HCWs is the provision of healthcare services to patients rather than data collection, analysis and usage. Inversely, Mpofu *et al.* (2014) found that nurses' shifting monitoring and evaluation duties to other professionals improved data quality, management and reporting.

Also, the study noted that having frequently and regularly supportive supervisions might contribute to influencing routine data analysis and usage. Supportive supervisions are expected to provide HCWs with some assessment on the gaps and weakness in providing services, including assessing the quality of data provided by the respective health facilities. More importantly, supportive supervisions are usually complemented with feedback, action plans and some training or clarification on the matter which was not understood by HCWs so as they can improve next time. These findings are in line with the study conducted by Desta *et al.* (2020), who revealed that health facilities that frequently had supportive supervision visits had a high chance of generating quality routine data, also using such routine data in planning and promoting the quality improvement of malaria service delivery compared to the facilities which had few or no supportive supervision visits. Moreover, Mboya *et al.* (2016) suggested that supportive supervision acted as an auditing and data quality assessment platform.

In contrast, routine data from data collection tools were compared to those reported to the next level. Madedeet *al.* (2017) added that supportive supervision compels HCWs to analyse and use the data gathered. Therefore, the current study establishes that these supportive supervisions, HCWs become conscious about the importance of routine upholding data quality and having help to building them with the spirit of routine analysing the data in order to identify the gaps and weakness before the next supportive supervisions or follow-ups of the agreed action plan of the previous supervisions.

Information of culture use was another organisational factor presented by the study. In this case, the study established that the culture of health facility with data analysis and use is pivotal in influencing the capacity and desire of HCWs to use the health data and information daily. As the study observed that, HCWs were comfortable in routine analysis and usage of data. This is concurred by Bhattacharya *et al.* (2019), who indicated that health facilities have the culture of monthly publishing of the malaria data. Since there are monthly malaria data published, it entails that there is routine utilisation of such data. Again, the culture of sharing health data and information was captured by Shiferaw *et al.* (2017). They reported that health facilities that regularly share health data and information on facilities posts had a higher chance of using the routine health data and information. Also, Goodman *et al.* (2011) revealed that the facility health management team held a clinical meeting that requires each department to present the key findings, including data from the previous week, to track the progress and performance of different health service delivery undertaken facility. The current study, therefore, argues that HCWs are working accordingly to reflect what their superiors are doing; in other words, this is to say, when facility health management team tend frequent use of health data and information, it will influence HCWs also to be accustomed to doing so.

Again, the study suggested that the availability of data collection and reporting tools may also determine whether or not HCWs have the capacity for routine data analysis and use. Different empirical studies, including (Alegana *et al.*, 2020; Colborn *et al.*, 2020; Kitojo *et al.*, 2019; Ohiri *et al.*, 2016), have strongly argued that in order for HCWs to utilise the routine malaria data successfully, there is a need to have adequate data collection tools in the first place. Also, Okello *et al.* (2019) argued that the shortage of data collection tools is among the primary reason behind the inadequate generation of routine data. Mboera *et al.* (2017) went a step further and contemplate that the shortage of data collection tools results from a limited health budget in some cases, but poor priorities linked to data usage may be the factors. For instance, HCWs who do not see the importance of routine data collection may delay requesting data collection tools. Okello *et al.* (2019) had another view related to data collection tools, and they revealed that sometimes the available data collection tools do not reflect the realities at the ground, in other words, this is to say, data collection tools are outdated compared to what can be generated in facilities.

Concerning the above, this present study argued that, without having accurate data collection tools in place, the entire process of gathering the health data for informed decision making becomes unviable. The study noted that some health facilities had poor recording keeping of the data collection and reporting tools during the observations. The study reached this conclusion because it was difficult for HCWs to remember or retrieve the previous or completed data sources documents, i.e. patients' registries, especially those last used in more than last three or six months. Therefore, if someone had to decide using the data and information from past months, it would be hard for them. This finding was also revealed by Alegana *et al.* (2020), who found out that most of the health facilities have a flawed system of data storage, especially those who are collecting data through the paper base. It was noted that most of the HCWs do not see the value to store the previous data collection tools, i.e., registers, after submitting the report to DHIS2. In this regard, the most primary data source is being lost, and the available data at DHIS2 are sometimes of inferior quality to be used for decision making.

### **5.5 Individual Factors Associated with Use of Health Information**

This study discovered that individual characteristics, behaviour, and attitudes somehow contributed to the routine use of health data and information among HCWs. The study revealed that the position of HCWs influences their capacity to engage with routine data management, analysis and utilisation. During the interviews with HCWs, they reported that most of HCWs especially, nurse and medical doctors are not much involved in the process of data management, analysis and usage compared to other cadres of HCWs such as pharmacists and laboratory technician who are daily updating data and information of patients they attend too. It was further noted that pharmacists and laboratory technicians usually depend on the routine data during ordering of anti-malaria drugs and malaria testing equipment, respectively. Also, some of the HCWs had a perception that data used for decision making to be the responsibilities of facility in-charges and management team, but for them.

Furthermore, the study established that the behaviour of HCWs influencing their capacity to analyse and use malaria data for decision making. The study found that most of HCWs had a negative attitude on data collection, analysis and utilisation. Even though some

HCWs were trained in data management and analysis skills, the study found out. Nevertheless, they felt like it was not part of the roles and responsibilities as HCWs instead, it was something which is needed to be done by data officers and statisticians. Other HCWs went to the extent of wanting motivation and incentive to use routine health data. These findings are following what was revealed by Wudeet *al.* (2020), who ascribed that, although pieces of training of data management and analytic skills are essential factors for utilisation of routine data and information gathered by health facilities, yet the attitudes of HCWs towards effective utilisation of routine health data is somehow being influenced by incentives given to use such routine health data and information.

Lastly, the study put forward the working experience of HCW as another individual factor that could influence the use of health data for decision making. The fact behind this is that newly recruited HCWs may have not yet being exposed to data management and analysis pieces of training. Also, they may not yet be aware of the standardised malaria indicators compared to their counterparts. Thus, in order to influence newly recruited HCWs to analyse and use health data and information, they need to be early exposed to the process of data management, analysis and usage. Gueyeet *al.* (2016) supported this finding, whereas, in their study, it was revealed that the newly tasked staffs lacked the required skills and experience when it comes to national malaria programme management. Therefore, this present study suggests that in order to counter-attack these challenges, newly HCWs could be exposed to on-job training. It will help create a culture of information use with a good attitude and values on generating quality data in the long run.

## **5.6 Chapter Summary**

The chapter has discussed the factors influencing HCWs capacity to analyse and use routine malaria data at health facilities. From the discussion made above, it is clear that the capacity of HCWs to collect, analyse and use health data and information routinely results from different factors, including; technical, organisational and individuals. Moreover, this chapter has shown no single factor that will singularly make the HCWs collect, analyse and use health data and information; instead, this is a function of multiple factors.

Thus, to increase the capacity of HCWs on data usage, they need to be provided with technical skills and abilities; also, health facility should have a working environment and capacity to support HCWs to analyse and use data. However, having the technical and organisational capacities, without the individual will and desire to collect, analyse and use health data and information for decision making, will not make any positive impact.



## **CHAPTER SIX**

### **6.0 CONCLUSION AND RECOMMENDATIONS**

#### **6.1 Introduction**

This chapter presents a summary, conclusions and recommendations of the study. The chapter is framed into five main sections. The first section is the present one which on the chapter overview. The proceeding section two offer the summary of the study and critical findings; section three is about the conclusion of the study, which is made based on the specific objectives of the study; section four provide a recommendation based on the essential findings and conclusion made, and lastly but equally important the chapter is windup by offer area for further studies which is structured in reflection on the study methodology employed and study findings.

#### **6.2 Summary of the Findings**

This study aimed to assess the factors influencing HCWs capacity to analyse and use malaria data for decision making while assuming the case study of Uvinza DC found in the Kigoma region, Tanzania. Three specific objectives guided the carrying of this study; the first objective was to determine technical factors; while the second and third objectives were to determine the organisation and individual factors influencing HCWs capacity to analyse and use malaria data for decision making.

Prior explaining the factors which influence HCWs' capacity to analyse and use malaria data for decision making. This study first attempted to establish how is malaria data being used by HCWs to make a different decision. The study's findings revealed that HCWs rely on routine malaria data gathered to make some critical decision during the delivery of malaria services. First, it was noted by the study that HCWs are using malaria data to improve the quality-of-service delivery. For instance, it was observed that HCWs are using routine malaria data to track the performance and provide feedback on the services deliver and plan for improving the services accordingly. Again, the routine malaria data are being used in planning for resource allocation, like malaria commodities such as procurement of malaria drugs and testing kits, and allocating HCWs who are supposed to oversee or attend malaria cases. Additionally, it was revealed by the study that malaria data are being used

for planning for community mobilisation and sensitisation campaign to control malaria diseases. For example, this has been done in tracking the number of houses reached through IRS or the number of pregnant women and under-five children who received LLINs.

Concerning the above usage of malaria data for different decision making, it was interesting for this study to identify the factors which affect HCWs' capacity to analyse and use malaria data for decision making. These factors have been grouped into three categories, namely, technical, organisational and individual. For technical factors, the study found that data management and analysis skills affect HCWs capacity to analyse and use malaria data. For HCWs to adequately analyse and use malaria data, sound data management and analysis skills are pivotal. In the absence of such skills, it becomes hard for them to manage and analyse the malaria data before making informed decisions.

Regarding this, it was found that most of the HCWs have essential data management and analysis skills, while other HCWs were reported to lack such skills. Another technical factor is knowledge of national malaria indicators. This was found to affect the usage of malaria data because such indicators are used for implementing malaria programmes. The study found out that not all malaria indicators are known to all HCWs. This signifies that, if they are not known well, malaria data cannot be used properly.

For organisation factors, the study found several factors such as; type of health institution, the number of HCWs, supportive supervision, the culture of data use, availability of data collection and reporting tools to affect HCWs' capacity to analyse and use malaria data for decision making. It was revealed that hospitals had a high chance of having enough data collection and HCWs responsible for data collection and analysis compared to health centres and dispensaries. Also, it was reported that most of the health facilities felt that they do not have ownership of malaria data, hence to use such data is not a priority to them. However, CHMT since health facilities are submitting malaria data to CHMT through DHIS2. Also, factor like supportive supervision was reported to influence HCWs' capacity to analyse and use malaria data. This was so because, through routine supportive supervisions, HCWs get the opportunity to receive mentorship and in-job training on how to analyse and use malaria data. The culture of health facility to use data was another factor

which was observed to influence HCWs' capacity to analyse and use malaria. This culture of data use was attributed to the way the health facility encourages its HCWs to use malaria data during weekly quality improvement meeting. Another institutional factor contributing to the influence usage of malaria data was the availability of data collection and reporting tools. It was found that facilities with enough data collection tools and reporting tools are more like routine collect and report malaria data, which will be used for decision making, compared to the facilities that do not have such tools.

Furthermore, the individual factors were assessed by this study. This category of factors included; the position of HCWs, behaviour aspects and working experience to help determine their capacity and how they are willing to analyse and use malaria data for decision making. For factor-like HCWs position had much influence on the capacity of HCWs to analyse and use malaria data. For instance, medical doctors were not much familiar with how to analyse and use malaria data, compared to HCWs who are directly engaged with daily usage of malaria data, such as lab technicians and pharmacists who are required to compile the malaria commodities every day and use the data to procure more malaria commodities. In terms of behaviour, the study found out that some HCWs felt like it was not their responsibility to collect and analyse malaria data rather than a job for data clerks. This hinders their capabilities and knowledge to analyse and use such data for decision making. For the working experience, the study revealed that the length an HCW has been employed or working on a malaria programme helps to increase their knowledge, shapes experience and positively influence their attitudes towards using malaria data for decision making.

### **6.3 Conclusion**

Based on the findings presented in chapter four and the discussion made in chapter five, this study generally concludes that malaria data are used in decision making, policymaking, planning and budgeting of health activities. Malaria data were found to be used by health facilities for planning to improve the quality of services, resource allocations, evaluation of facility performance and planning for malaria preventive interventions. Despite all the usefulness's of malaria data, the study concludes that HCWs are not adequately using malaria data for decision making as most of them thought that

using data for decision making is above the authorities and jurisdictions or pay grade. This made HCWs think that they do not have ownership of gathered data. It was revealed that their primary responsibility was to collect and report the data to either facility management or CHMT. Further, the study concludes that HCWs capacity to routine analyses and use malaria data is determined by the interrelated technical, organisation and individual factors.

As far as the technical factors are concerns, the study concludes that most HCWs do not have adequate knowledge and skills regarding data management and analysis, which is the crucial factor for data analysis and usage before making an informed decision that requires to be backed up by data. Skills related to data analysis were found to be low due to lack of pieces of training and capacity buildings, as the result data produced by HCWs are found to be of low quality. Henceforth, this impedes the use of data in decision and policymaking. Also, the study established that there are proper and regular pieces of training that could be provided to HCWs to introduce either new skills or act as refreshment on skills.

The study also evidently reported that organisation factors influence the HCWs to use data in decision making. Therefore, the study concludes that most health facilities, especially dispensaries, do not have enough capacity and ability to influence HCWs to analyse and use malaria data and information compared to other types of health facilities such as hospitals and health centres. This conclusion is reached based on the facts that most health facilities do not have the culture of information use adopted by HCWs. Also, a low number of HCWs could be another factor to justify this conclusion. Furthermore, supportive supervisions are essential, yet they occur irregularly due to insufficient funds allocated for this activity.

Again, the study concludes that individual factors should also be considered if and only if HCWs are to be influenced in using data for decision making at their level of operations. The rationale for this closure is that some HCWs have negative attitudes and perceptions regarding data collection, analysis, and usage, as they do not prioritise it unless motivated through incentives. This is because HCWs have perceived that data collection and analysis are not part of their roles and responsibilities.

The last important conclusion is that to successfully influence HCWs to collect, analyse, and use malaria data and information. All of the above factors must be treated as one simply because they depend on each other. For instance, HCWs may have a will to collect, analyse, and use data, but it will be meaningless if there is no culture of information use at the facility. Also, HCWs desire and facility culture to use information might be there, but data will not be sufficient and efficient without technical skills and capacity.

#### **6.4 Recommendations**

The following are recommendation which is informed by the key findings of the study and conclusions made above. These recommendations are addressed in recognising the specific categories of actors, including; R/CHMTs, health facility management, and HCWs.

##### **6.4.1 Recommendation to R/CHMT**

The below recommendations are made explicitly for R/CHMT to ensure that the facilities and HCWs within the district are effectively gathering and use malaria data;

- i. The study is recommending to R/CHMT that they need to work closely with the health facility management team in order to identify the gaps in data analysis and usage among HCWs. This will help establish or identify the need for training as far as data management and analysis skills are concerned.
- ii. R/CHMT should encourage and motivate health facilities and HCWs to have ownerships of the data. This is said since HCWs have a wrong perception of thinking that the gathered and reported data are for R/CHMT usage for high decision making and policymaking. While, in reality, these data are supposed to help health facility even before are being reported to the next level.
- iii. The study also recommends that R/CHMT regularly conduct supportive supervision, which should be accompanied by close follow-ups of action plan made during supervision. This is important as it will help to continuously strengthen the capacity of HCWs on malaria data analysis and usage.

#### **6.4.2 Recommendation to Facility Management Team**

Facility management teams are recommended to do the following to promote malaria data gathering and use among their HCWs;

- i. Based on the challenges faced by health facilities related to deficient skills in data management, analysis and usage among HCWs found. The study recommends that the facility establish in-service or on-job training for new HCWs or soft skills and knowledge on data management and analysis. These should include the basic training focused on M&E skills, data analysis, data quality, data management, data use and basic computer skills.
- ii. Also, facility management teams are encouraged to build a culture of data sharing and decision-making. This will help to increase motivation and awareness to HCWs on the importance of data analysis and use for decision making.
- iii. The study also recommends that facility management teams ensure that there is the availability of proper allocation of human resources in healthcare services to ensure that services are adequately provided. However, at the same time, data are collected accordingly.
- iv. Strengthen organisational resources that support information used at all levels by providing data collection and reporting tools to HCWs complemented by data review meetings and job aids outline the process to analyse and use the malaria data.
- v. Health facility management teams are consistently encouraged to conduct weekly data quality review meetings to influence HCWs on the routine use of gathered malaria data. Also, the facility could have weekly DQA to assess the quality of data gathered by HCWs before such data are used for decision making.
- vi. HCWs should be included in the planning and budgeting of health facility activities. This will help HCWs to understand and be aware of why malaria data analysis and use is essential to them.

### **6.4.3 Recommendation to HCWs**

The following recommendations are directed explicitly to HCWs so as they can make effective gathering and usage of malaria data;

- i. Generally, the study encourages HCWs to start using health information and data for decision making. This will help them to improve the way they healthcare provide services based on the data of patients.
- ii. Also, HCWs should understand that the routine collection and reporting of malaria data improves the quality of services they provide. In this regard, HCWs should understand that they are accountable for providing quality data which will then be used to make the informed decision. Also, this goes hand in hand with the ownerships of data they produce in the sense that if the way they value the data will affect the quality of services they deliver to patients.
- iii. To HCWs, the study recommends that they build a learning spirit that will help them acquire data management and analytics skills instead of just waiting for the government or other stakeholders to arrange training. With this fast technological advancement, it is now easier more than ever for someone to learn essential data management and analysis through the internets. All it requires is a learning spirit and a desire for self-improvements.

### **6.4.4 Recommendation to the Ministry of Health**

More importantly, since the study has showed the useful of routine malaria data for decision making. The study is therefore recommending that, the Ministry of Health Community Development, Gender Elderly and Children to formulate the policies and strategies which will promote the capacity of HCWs to analyse and use malaria data more often. Additionally, such policies and strategies should be developed in a way which promote the ownership of data from low level, i.e., HCWs found in health facilities.

### **6.5 Area for Further Studies**

The study calls for further studies to be conducted using a mixed methods approach since this study employed only a qualitative approach. Also, more studies should be conducted to compare different geographical areas or different categories of the health facilities, such as public against private facilities or health centres against dispensaries.

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## APPENDICES

### Appendix I: Consent Form English Version

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES  
DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS**



ID-NO

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### Consent to Participate in a Study

Greetings!

My name is **Nazir Yup**; I am a student at Muhimbili University of Health and Allied Sciences pursuing an MSc. Project Management, Monitoring, and Evaluation in Health

### Purpose of the study

This study aimed to assess factors influencing health worker's capacity to analyse and use malaria data: the case of Uvinza district in Kigoma region, Tanzania.

### What Participation Involves

If you agree to join the study, you will be interviewed face to face with me to answer a series of questions in the questionnaire prepared for this study; this will take about 15 to 30 minutes for one interview.

### Confidentiality

I assure you that all the information collected from you will be kept confidential. Your name will not be written on any questionnaire or any report/documents that might let someone identify you. Confidentiality will be observed, and unauthorised persons will have no access to the data collected. Moreover, the information collected during the interview will be analysed by using an identification number. If this study is published or

presented at a scientific meeting, names and other information that might identify you will not be used.

**Right to Withdraw and Alternatives**

Taking part in this study is voluntary. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve a penalty.

**Risk**

No harm is anticipated to you because of participating in this study.

**Benefits**

You will derive no direct benefit from participating in this study; however, the results of this study will provide valuable information regarding data use for decision making in malaria interventions.

**In Case of Injury**

We do not anticipate that any harm will occur to you.

**Whom to Contact**

If you have any questions about this study, please do not hesitate to contact:

**Nazir Yusuph**, who is Principal Investigator (PI), the Muhimbili University of Health and Allied Sciences (MUHAS), P. O. BOX 65001, Dar es Salaam (Mobile no. +255 782 444 396)

**Dr MuhigwiraMwangu** who is a supervisor of this study. The Muhimbili University of Health and Allied Sciences (MUHAS), P. O. BOX 65001, Dar es Salaam.

**Signature:**

Do you agree?

Participant agrees ..... Participant disagrees.....

I ..... have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of Participant.....

Signature of Research Assistant.....Date of signed consent.....



## Appendix II: Consent Form Swahili Version

### CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI KURUGENZI YA UTAFITI NA UCHAPISHAJI



#### Ridhaa ya kushiriki katika utafiti

Habari! Jina langu ni **Nazir Yusuph**. Mwanafunzi katika Chuo Kikuu cha Tiba na Afya shirikishi Muhimbili, ninasoma shahada ya pili za uzamili katika fani ya afya ya jamii.

#### Dhumuni la ushiriki

Dhumuni la utafiti huu ni kutaka kufahamu upatikanaji na unafuu wa huduma za afya ya macho Tanzania.

#### Kushiriki kuna husisha nini?

Ukikubali kushiriki katika utafiti huu utahitajika kutumia muda wa dakika 15 mpaka 30 kwa ajili ya kujibu maswali utakayoulizwa na mtafiti.

#### User

Majibu yote yatakusanywa kutoka katika eneo la utafiti na yataingizwa kwenye compyuta kwa kutumia namba ya utambulisho tu. Hakuna jina la mshiriki litakalochapishwa.

#### Haki ya Kutokana Mbadala

Kushiriki katika utafiti huu ni uchaguzi wako, una uhuru wa kukubali au kukataa kushiriki katika utafiti huu. Pia unaweza kuacha kushiriki katika utafiti huu muda wowote utakapojisikia hivyo hata kama umeshakubali kushiriki. Kukataa kushiriki au kuacha kushiriki katika utafiti huu hakutakufanya upate adhabu.

#### Faida

Ukikubali kushiriki katika utafiti huu hakuna faida ya moja kwa moja utakayopata lakini tunaamini maelezo utakayoyatoa yatasaidia; Hata hivyo, matokeo ya utafiti huu yatatoa habari muhimu kuhusu unafuu na upatikanaji wa huduma za macho.

**Madara**

Hatutegemei kwamba utapata madhara yoyote ya kimwili kwa kushiriki katika utafiti huu

**Mawasiliano**

Ukiwa na swali au tatizo lolote, unaweza kuwasiliana na wafuatao:

Nazir yusuph, ambaeni mtafiti mkuu. Chuo kiukuu cha muhimbili S.L.P 65001, Dar es Salaam. Namba ya simu, Simu: +255 782 444 396, Barua pepe: leyonph@gmail.com

Dr. Mughwira Mwangi, amabae ni msimamizi mkuu wa utafiti huu. Chuo kiukuu cha muhimbili S.L.P 65001, Dar es Salaam. Namba ya simu, +255 713 253 513

Mimi, \_\_\_\_\_, nimesoma/ nimesomewa maelezo yote yaliyomo kwenye fomu hii na nimeelewa maelezo yote yaliyomo kwenye fomu hii na kuelewa vizuri madhumuni na utaratibu wa kushiriki katika utafiti huu. Nakubali kushiriki katika utafiti huu.

Sahihi \_\_\_\_\_ Tarehe \_\_\_\_\_

Sahihi ya Mtafiti \_\_\_\_\_ Tarehe \_\_\_\_\_

**Sahihi**

Je umekubali?

Mshiriki amekubali.....Mshiriki Hajakubali.....

Mimi.....nimesoma maelezo ya fomu hii. Maswali yangu yamejibiwa. Nimekubali kushiriki katika utafiti huu.

Sahihi ya mshiriki.....

Sahihi ya shahidi (kama mshiriki hawezi kusoma) .....

Sahihi ya mtafiti.....

Tarehe ya ukubali wa kushiriki.....

**Tarehe** \_\_\_\_\_

## **Appendix III: IDI Guide for English Version**

### **About this interview—and why your participation is so important**

In health information systems, the ultimate purpose of collecting and analysing data is to improve programs by enabling more informed decisions based on facts. However, information is not always available to make decisions—or if it is available, it is not always used. This study is designed to determine what barriers and constraints are causing these conditions and how to resolve them. Your participation is requested to provide your insights about constraints and barriers to data use. Your participation is significant to this research, but it is entirely voluntary. Your responses will be treated as confidential. We will ensure that any statements or comments you make cannot be linked either to you as an individual or to your organisation. We will produce a report that is intended mainly to help Health facilities, CHMT, RHMT staff, and other stakeholders design effective monitoring and evaluation activities.

Are you willing to participate? YES  NO  (stop the interview if the answer is No)

### **OPENING QUESTIONS**

- 6.1 Do you collect any malaria data regularly? *Probe 1: If YES, what are the critical data elements? Probe 2: Are there any key indicators that you calculated from the gathered data?*
- 6.2 Are you using the malaria data at this facility for decision making? *Probe 1: What decision have been made based on the collected data? Probe 2: How did you use the collected data for decision making?*

### **TECHNICAL CONSTRAINTS**

1. What is your technical capacity to use the malaria data for decision making? *Probe 1: The role of external assistance.*
2. What technical challenges do you face when it comes to malaria data? *Probe 1: The competence in data gathering and analysis of indicators. Probe 2: Do you face any challenge to use the malaria data for decision making?*
3. What can be done to overcome the technical constraints that hinder the usage of malaria data for decision making?

**ORGANISATIONAL QUESTIONS**

1. What are the organisation factors which affect your or HCWs' capacity to analyse and use malaria data at this facility?
2. How does your facility support the prioritisation of using malaria data for decision making? *Probe1: Culture of data use and supportive supervisions*
3. What challenges do you face as the facility that hinder your capacity to analyse and use malaria data?

**INDIVIDUAL QUESTIONS**

1. What individual factors affect your or HCWs' capacity to analyse and use data on malaria data at this facility? *Probe 1: Behavior and attitudes of the HCWs towards malaria data analysis and usage.* Probe 2: The role of motivation and incentives.
2. What can be done to overcome the individual problems which affect HCWs' capacity to analyse and use malaria data?

**CLOSING THOUGHTS**

1. Do you have anything to share before closing this interview?

## **Appendix IV: IDI Guide for Swahili Version**

### **Kuhusu mahojiano haya — na kwa nini ushiriki wako ni muhimu sana**

Katika mifumo ya habari za afya, lengo kuu la kukusanya na kuchambua taarifa (Data) ni kuboresha mipango kwa kuwezesha maamuzi zaidi ya taarifa kulingana na ukweli. Hata hivyo, taarifa hazipatikani kila wakati ili kufanya maamuzi — au kama ipo, haitumika mara kwa mara. Utafiti huu umeundwa ili kujua ni vikwazo vipi na vikwazo vinavyosababisha masharti haya, na jinsi ya kuzitatua. Ushiriki wako Umeombwa kutoa maoni yako kuhusu vikwazo na vizuizi vya matumizi ya taarifa katika kituo cha afya. Ushiriki wako ni muhimu sana kwa utafiti huu, Majibu yako yatachukuliwa kama ya siri, na Tutahakikisha kwambaka ulizozote au maoni unayofanya hayawezi kuunganishwa ama wewe kama mtu binafsi au kwa shirika lako. Tutazalisha ripoti ambayo inalenga hasa kusaidia vituo vya afya, CHMT, wafanyakazi wa RHMT na wadau wengine ili kubuni shughuli za ufuatiliaji natathmini kwa ufanisi katika kutoa kipaumbele cha matumizi ya taarifa.

Je, uko tayari kushiriki? NDIYO  HAPANA  (Sitishanahojiano kama jibuni hapana)

### **MASWALI YA UTANGULIZI**

1. Je! Unakusanya takwimu yoyote ya malaria mara kwa mara? Dodosa 1: Ikiwa NDIYO, ni mambo gani muhimu ya takwimu? Probe 2: Je! Kuna viashiria muhimu ambavyo umehesabu kutoka kwa takwimu iliyokusanywa?
2. Je! Unatumia takwimu za malaria katika kituo hiki kufanya uamuzi? Dodosa 1: Je! Ni uamuzi gani umefanywa kulingana natakwimu ziliyokusanywa? Dodosa 2: Ulitumiaje takwimu iliyokusanywa kwa kufanya uamuzi?

### **MASWALI YA SABABU ZA KIUFUNDI**

1. Je! Una uwezo gani wa kiufundi kutumia takwimu za malaria kwa kufanya uamuzi? Dodosa 1: Jukumu la usaidiziwanje
2. Je! Unakabili wanachangamoto gani za kiufundi wakati wa data ya malaria? Dososo 1: Uwezo katika kukusanya data na uchambuzi wa viashiria. Dososo 2: Je!

Unakabili wanachangamoto yoyoteya kutumia data ya malaria kwa kufanya uamuzi?

3. Ni nini kifanyike kushinda vizuizi vya kiufundi vinavyozuia utumiaji wa takwimu ya malaria kwa kufanya uamuzi?

### **MASWALI YA SABABU ZA KITAASISI**

1. Je! Ni sababu gani za shirika zinazo athiri uwezo wako au wa hudumu wa afya kuchambua na kutumia takwimu za malaria katika kituo hiki?
2. Je! Kituo chako kinasaidia vipi kipaumbele cha kutumia data ya malaria kwa kufany auamuzi? Probe 1: Utamaduni wa utumiaji wa takwimu na usimamizi unaounga mkono
3. Je! Unakabili wanachangamoto gani kama kituo ambacho kinakuzuia uwezo wako wakuchambua na kutumia takwimu ya malaria?

### **MASWALI YA SABABU BINAFSI**

1. Ni mambo gani ya kibinafsi yanayo athiri uwezo wako au wa humuduma wa afya kuchambua na kutumia data juu ya data ya malaria katika kituo hiki. Dodosa 1: Tabia na mitazamo ya wahumudumu wa afya kuelekea uchambuzi wa data ya malaria na matumizi. Dodosa 2: Jukumu la motisha na motisha.
2. Ni nini kifanyike kumaliza shida za kibinafsi zinazoathiri uwezo wa wahumudumu wa afya kuchambua na kutumia data ya malaria?

### **HITIMISHO**

1. Je! Una chochote cha kushiriki kabla ya kufungama hojiano haya?

**Appendix V: Data Observations and Abstraction Checklist**

<b>SN</b>	<b>Observation hint</b>	<b>Response</b>
1	Does the facility display the following data? Please indicate the types of data displayed and whether the data have been updated for the last reporting period?	1. Yes 2. No
2	Related to Malaria cases <i>(Circle all applied)</i>	1. Table 2. Graph/chart 3. Map/other
3	Related to Malaria Indicators on Maternal/Child Health <i>(Circle all applied)</i>	1. Table 2. Graph/chart 3. Map/other
4	Indicators related to malaria data for utilization such as commodity procuremnets <i>(Circle all applied)</i>	1. Table 2. Graph/chart 3. Map/other
5	Disease surveillance <i>(Circle all applied)</i>	1. Table 2. Graph/chart 3. Map/other
6	Picture of malaria graphs represented on facility notice board?	1. Yes 2. No