Integration of Dengue Control Into National Malaria Control Program In Tanzania

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INTEGRATION OF DENGUE CONTROL INTO NATIONAL MALARIA CONTROL PROGRAM IN TANZANIA

By

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A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Science in Project Management, Monitoring and Evaluation in Health of Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned, certify that have read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled: **"Integration of dengue control into national malaria control program in Tanzania",** in (partial) fulfillment of the requirements for the degree of **Master of Science in Project Management, Monitoring and Evaluation in Health** of Muhimbili University of Health and Allied Sciences.

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Date_____

DECLARATION AND COPYRIGHT

I, **Dorice D. Lyimo**, declare that this **dissertation** is my original work and that it has not been presented and will not be presented to any other institution for similar or any other degree award.

Signature …….. **Date** …….

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DEDICATION

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ABSTRACT

Background: While Tanzania is implementing the Neglected Tropic Diseases Program (NTD), Dengue is not part of this program. Tanzania is also implementing the National Malaria Control Program (NMCP), another mosquito-borne disease program. Furthermore, the World Health Organization (WHO) recommends a Dengue to be included in the Integrated Vector Management (IVM). There is a dearth of information on why Dengue is not featuring in any of NTD or NMCP while the IVM is not implemented accordingly in Tanzania.

The objective of the study: To explore the organizational, technical, and individual factors for the integration of dengue control into the malaria control program in Tanzania.

Materials and Methods: An exploratory Cross-sectional study design was conducted whereby a qualitative approach was used. Fifteen key informants were purposefully selected from MoHCDGEC, NMCP, and NTD. Thematic analysis was employed to analyze the collected information.

Results: The study found that adequacy of human resources to support integration, the existence of defined organizational structure, the existence of policy and guidelines, availability of funds or integration, and stakeholders' interests; are all organizational facilitators for the integration of dengue into malaria national control program in Tanzania. Additionally, adequacy of knowledge and skills in controlling dengue and malaria, positive perception and attitude towards integration, and motivation toward integration; were all found to be individual facilitators for the integration of dengue into the malaria national control program in Tanzania. Moreover, the existence of systems for reporting, adequate technical devices/facilities, and adequate technical tools for data collection were also found to be the technical facilitators for the integration of dengue into the malaria national control program in Tanzania.

However, the study also revealed some barriers to the integration of dengue into the national malaria control program. The study found three perceived barriers namely; additional costs, varying donor interests, and additional workload, which were all, found to be organizational barriers for integration of dengue into the national malaria control program. Also, the

perceived negative attitude was found to be an individual barrier towards the integration of dengue into the malaria national control program.

Conclusion: Based on the study objective and study findings, the study has shown that it is possible to integrate dengue into the national malaria control program. The organizational, technical and individual factors can influence the integration of dengue into the national malaria control program. Therefore, it is important to consider these factors (organizational, technical and individual) during the integration of dengue into the national malaria control program.

Recommendations: Based on the possibility for integration as revealed by this study, a feasibility study is recommended for integrating dengue into the National Malaria Control Program. The feasibility study will pave the way for further knowledge to broaden the economic, managerial, and technical aspects of integration.

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ABBREVIATIONS AND ACRONYMS

CEO	Chief Executive Officer
CIO	Chief Information Officer
ERP	Enterprises Resource Planning
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IMAM	Integrated Management of Acute Malnutrition
IRS	Indoor Residual Spraying
ITNs	Insecticide Treated Nets
MCH	Maternal and Child Health
ME	Monitoring and Evaluation
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MoHSW	Ministry of Health and Social Welfare
MUHAS	The Muhimbili University of Health and Allied Sciences
NIMR	National Institute for Medical Research
NMCP	National Malaria Control Program
NMSC	National Malaria Steering Committee
PI	Principal Investigator
RAS	Regional Administrative Secretary
RCH	Reproductive and child health
RMNCAH	Reproductive, Maternal, newborn child, and Adolescent Health
SAM	Severe Acute Malnutrition
SWAp	Sector Wide Approach
TB	Tuberculosis
TMT	Top Management Team
UN	United Nations
UNAID	United Nations Joint Programme on HIV/AIDS
UNFPA	United Nations Population Fund

UNICEF	United Nations Children Fund
URT	United Republic of Tanzania
USA	United States of America
WHO	World Health Organization

DEFINITION OF TERMS

Integration- means that separate technical services, and their management support systems, are provided, managed, financed, and evaluated either together, or in a closely coordinated way. The organization and management of health services so that people get the care they need, when they need it, in ways that are user friendly, achieve the desired results, and provide value for money (1)

Malaria - is a mosquito-borne infectious disease transmitted by a female Anopheles mosquito (2).

Dengue- Dengue is a febrile viral infection caused by four different viruses (dengue virus serotypes 1–4) that are transmitted by Aedes mosquitoes (3).

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

As defined by the World Health Organization (WHO) the integration of health services is "the process of bringing together common functions within and between organizations to solve common problems, developing a commitment to shared vision and goals, using common technologies and resources to achieve these goals".(4). Similarly, Integration of Health Services Delivery (IHSD) considers the integration of health services as management and delivery of health services in a continuum approach of which aims to bridge the gaps of health services delivery, poor coordination, and improvement of health care systems. In the end, the integration is believed to ensure that services are not disjointed from the perception of the service users and that each individual can easily navigate through the system's various levels and settings of care(5)

The Global Strategic Framework on Integrated Vector Management (IVM) sets out new and broad principles and approaches to vector control that applies to all vector-borne diseases. Integrated vector management seeks to improve the efficacy, cost-effectiveness, ecological soundness, and sustainability of disease vector control. An IVM approach takes into account the available health infrastructure and resources and integrates all available and effective measures, whether chemical, biological, or environmental. IVM also encourages effective coordination of the control activities of all sectors that have an impact on vector-borne diseases. Also, commensurate benefits for non-health-sector partners make it more likely that IVM approaches will be effective. (6)

Likewise, the multi-disease strategy can be applied to other vector-borne diseases within the framework of IVM and an integrated approach to controlling neglected tropical diseases. To be successful, IVM requires an inventory of essential functions and organizational structures that prioritize the use of financial, human, and technical resources for controlling vector-borne diseases. (4) According to WHO, health services integration is the first joint WHO-UNCEF vision for primary health care in the 21st century (7). Also, integration is in part of the call concept in the Declaration of Alma Ata on primary health care for bringing health care as

close as possible to where people live and work and constitutes the first element of a continuing health care process (8,9).

Some studies have revealed that there is much in common between the WHO Global Malaria Programme and WHO Global Programme to Eliminate Lymphatic Filariasis is because they both share a large proportion of their target population and they have similar goals and strategies. Using an IVM approach allows programs to control malaria and lymphatic filariasis to coordinate and benefit from each program's activities, thus enhancing their overall impact on public health. This also shows both are affected by the same vector-control interventions (insecticide-treated mosquito nets, indoor residual spraying, and larval control). (10).

Globally, there are initiatives in Integrated Vector Management (IVM) approach which is applicable to control all vector borne-diseases which in this case includes malaria and dengue. The Integration of Dengue and Malaria is essential because both Dengue and malaria are mosquito-borne diseases, and the main methods to control or prevent their transmission are similar. While the Dengue virus is transmitted by female mosquitoes mainly of the species Aedes aegypti and to a lesser extent, Aedes Albopictus (11) and malaria parasites are mainly transmitted by a female Anopheles mosquito (12), they are both vector-borne diseases. The mosquito that is responsible for the transmission of dengue also transmits chikungunya, yellow fever, and Zika infection (13).

Historically, severe dengue was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand (14). Today, about 40% of the world's population lives in an area endemic with dengue in more than 100 countries (13). Globally, one estimate indicates 390 million dengue infections per year (95% credible interval 284–528 million), of which 96 million (67–136 million) manifest clinically (with any severity of disease). (12). In Africa, dengue infections have been reported since the 19th century. Between 1960 and 2010, laboratory-confirmed dengue outbreaks were reported in 34 African countries; most of which occurred in Eastern Africa (18).

For Tanzania in particular, dengue was first described by Spanish sailors visiting the South coast of Tanzania during the 15th Century. On March 19, 2019, the World Health

Organization was notified of the Dengue fever outbreak in Dar es Salaam, Tanzania. On 11th August 2019, the total confirmed cases reported since the beginning of the outbreak were 6,873 cases including 13 deaths (19). Before 2019, Tanzania reported Dengue epidemics in 2010, 2012, 2013-2014, and 2018. In 2013 and 2014, Tanzania experienced the first worst dengue outbreak whereas a total of 1,969 and 961 cases of suspected and confirmed dengue cases were reported respectively. Of those confirmed cases, the majority (99.4%) were cases reported in Dar es Salaam. Other affected regions were Arusha, Dodoma, Kagera, Kigoma, Kilimanjaro, Lindi, Mbeya, Morogoro, Mwanza, Njombe, and Ruvuma (20).

There is no specific therapy for dengue infections, but ultimately initiatives aimed at vector control and prevention of mosquito bites may provide the greatest benefits (21). Tanzania has no strategic plan for dengue control interventions. According to Africa news, on 3th 0ct 2019, there were several announcements by the government of Tanzania through the Ministry of Health (MoH) during the outbreak of Dengue fever. On 4th July 2019 MoH stated that: "the government had drawn up an ambitious national plan of destroying mosquito breeding grounds in residential areas to control the spread of malaria disease and the outbreak of dengue fever". Despite the absence of strategic plans/interventions of dengue in Tanzania, the government has put in place the procedures to follow the development of dengue cases. Some of the procedures put in place included; allocation of budget by the district council to purchase the pesticides, carrying out the fumigation to destroy the breeding sites of mosquitoes, and among others. However, most of these procedures have been implemented in ad-hoc in nature.

The recent efforts by the Government of Tanzania through the Ministry of Health and Social Welfare and other development partners that are implementing malaria control through the National Malaria Control Program (NMCP) were introduced and launched in 2003. In the first Malaria Medium Term Strategic Plan in 2003, among other initiatives, it catered for malaria control in the country between 2002 and 2007. The second Malaria Medium Term Strategic Plan covered the period 2008 – 2013 and the recent one is the National Malaria Strategic Plan 2014-2020 which outlines a long-term vision of a society free from malaria but with no plans for dengue.

At present, the main method to control or prevent the transmission of the dengue virus and malaria is to combat vector mosquitoes. Based on their similarity on the methods of controlling malaria and dengue and the government's ad-hoc approach of Dengue control and the national plan ambition of destroying mosquito-spread of malaria disease and the outbreak of dengue fever; it is important to integrate the two programs. Nevertheless, the study has not come across any document/report that showed the possibility of integrating malaria and dengue control methods or the factors, which can be considered to integrate malaria and dengue.

1.2 Statement of the Problem

Literature points out that integration of programs is influenced by several factors which include organizational factors, technical factors, and individual factors (24,30). Also, learning from other studies as they are done in the Expanded Program on Immunization and reproductive and child health integration in different country including Tanzania, there is a possibility of integration of vertical programs. There is a potential advantage to integrate dengue into NMCP because the integration will improve the efficacy of services delivery, reduce costs (cost-effectiveness) especially when the resources used are the same, ecological soundness especially during interventions on the breeding sites where malaria and dengue have commonalities and sustainability of dengue virus control. Also, the integration of dengue will help to control other diseases like yellow fever, Chikungunya and Zika once erupted. This is because the mosquito responsible for transmitting dengue is also transmitting yellow fever, Zika, and Chikungunya.

In Tanzania, there is the existence of different vector-borne diseases like Lymphatic filariasis, Onchocerciasis, dengue, and Trachoma (24). While Lymphatic filariasis, Onchocerciasis, Schistosomiasis, Soil-transmitted helminths, and Trachoma are contained in the Neglected Tropic Diseases (24), Dengue is not part of this program. The latter happens despite the recommendation WHO of including do, not implement Dengue in the Integrated Vector Management (IVM), accordingly in Tanzania. Currently, the IVM is implemented under the malaria vector control strategy in NMCP (25,26). Additionally, mosquitoes transmit both malaria and dengue, and thus the main methods to control or prevent their transmission are

similar. The latter poses questions as to why Dengue control is not integrated into either of the two programs.

Therefore, this study seeks to explore the organizational, technical, and individual factors for the integration of dengue control into the malaria control program in Tanzania.

1.3 Rationale of the Study

This study will help to add new knowledge on the factors that can be considered during the integration of malaria and dengue vector control strategies through NMCP in Tanzania. Therefore, this study has been done to generate knowledge for further scientific researches and hence reducing/minimizing the resources by integrating dengue into the malaria control program.

1.4 Evaluation Questions

1.4.1 The Main Evaluation Question

1. What are the organizational, individual, and technical factors that influence the integration of dengue vector control into the malaria control program in Tanzania?

1.4.2 Specific Research Questions

1. What are the organizational factors that influence the integration of dengue control into the malaria control program in Tanzania?
2. What are the individual factors that influence the integration of dengue control into the malaria control program in Tanzania?
3. What are the technical factors that influence the integration of dengue control into the malaria control program in Tanzania?

1.5. Evaluation Objective

1.5.1 The Main Evaluation Objective

To explore the organizational, technical, and individual factors that influence the integration of dengue control into the malaria control program In Tanzania.

1.5.2 Specific Evaluation Objectives

1. To explore the organizational factors that influence the integration of dengue control into the malaria control program in Tanzania.

2. To explore the individual factors that influence the integration of dengue control into the malaria control program in Tanzania.
3. To explore the technical factors that influence the integration of dengue control into the malaria control program in Tanzania.

1.6 Conceptual Framework

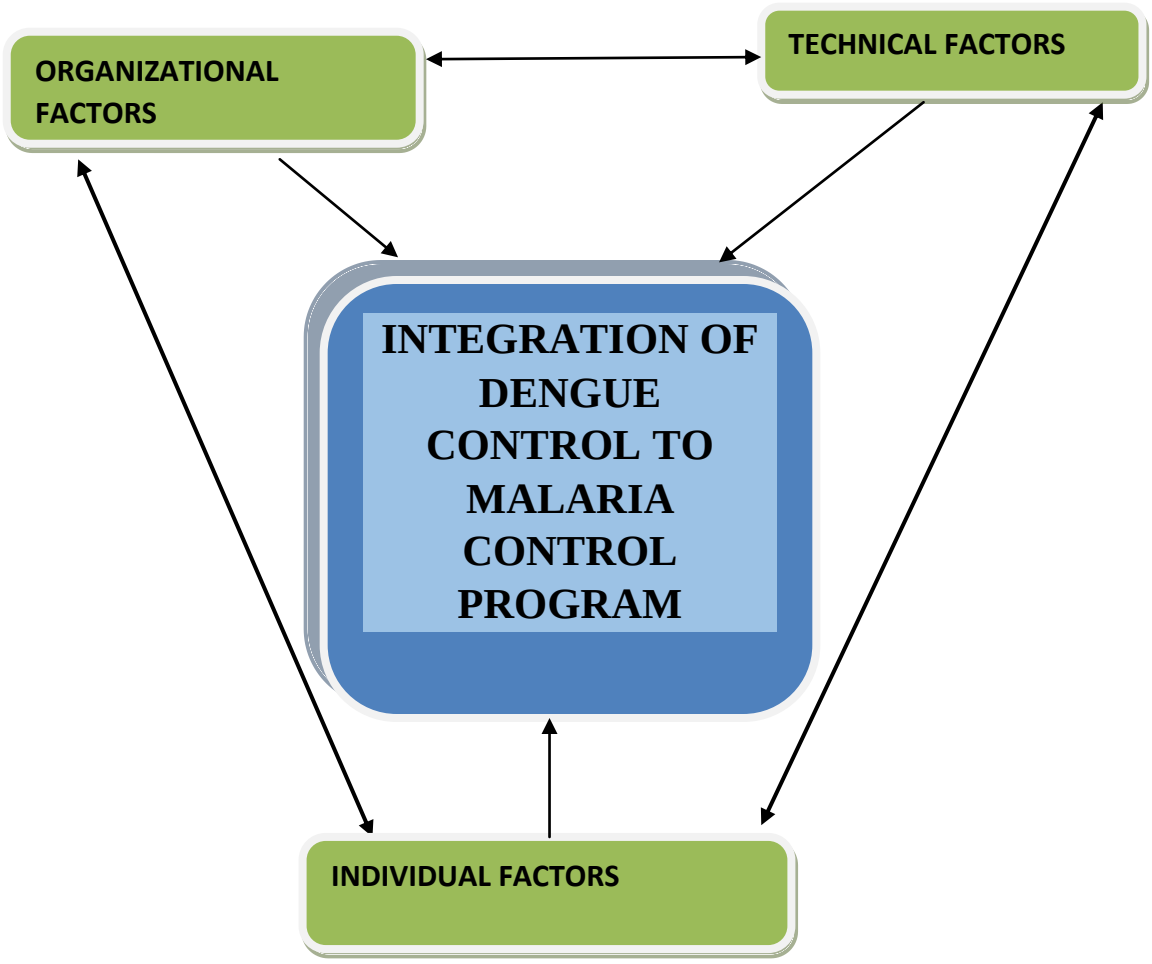
To have well-functioning integrated health interventions, there are some factors that support and ensure the effectiveness of the implementation of any integration (fig 1). Therefore, this study aimed to explore those factors for integration of dengue control into the malaria control program in Tanzania by looking at those factors in three different levels of Organizational, Technical, and Individual factors.

Organizational Factors; one key to understanding the failure or success of integrating services is found in the dynamics of complex organizations and organizational networks. Several factors can be considered in the integration of an organization, these factors can be; Organizational structure, resources, guidelines, policy roles, and responsibilities within the department. The Reproductive and health Integration report conducted in Tanzania has shown that organizational factors have a huge contribution to the integration process. (8).

Individual Factors; To have a good integration in the health system, individual plays a great role in the accomplishment of the successful health integration. The health professionals who can implement the activities for malaria and dengue control integration should be expected to have knowledge, skills, motivation, and acceptance (27–29). Also, The report from MoHCDGEC reported that motivation through the provision of knowledge and skills among staff; are among the contributing factors which affect to Reproductive and Child Health Integration in Tanzania (8).

Technical Factors: To measure the performance of the integration by evidence, the technical part is very important and an integral part of integration as it supports the process by identifying and by looking at the NMCP health information systems.

Fig. 1 Conceptual framework



Source: Researcher's construction based on concepts of integration by Mueenuddin L, et al (24) and Warren C, et al (30).

In this aspect, several factors support the technical aspect in the collection processes (how data is collected and at what intervention), available systems (this is the presence of the designed system that is responsible for accepting the data entered), and the presence of the methods of data entry through the system (30,31). The Report on Assessing the Benefits of Integrated HIV and SRH Services in Intervention showed that collection of reviews and use of routine data from PNC, FP, and CT register there was a problem as no single register could record Integrated Service (23).

CHAPTER TWO

2.0 LITERATURE REVIEW

Dengue fever is a severe infection, a flu-like illness transmitted to humans through the bites of infected female Aedes mosquitoes. Dengue shock syndrome is the most severe form of dengue infection. Dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas (32). Primary prevention which includes the use of mosquito repellents, mosquito bed nets, mosquito coils, protective clothing and regularly removing sources of stagnant water to prevent mosquito breeding is suggested as the most effective measure in dengue prevention and control (33). There is no specific therapy for dengue infections. The effort to address Dengue in Tanzania for severe dengue through Maintenance of the patient's body fluid volume is critical to severe dengue care. Malaria is a mosquito-borne disease mainly transmitted by a female Anopheles mosquito. The government of Tanzania through MoHCDGEC initiated the program to control the transmission of malaria through combating vector mosquitoes.

The government of Tanzania through the Ministry of Health had drawn up an ambitious national plan of destroying mosquito breeding grounds in residential areas to control the spread of malaria disease and the outbreak of dengue fever. Since both malaria and dengue are transmitted by mosquitoes with different species and the main methods to control the transmission of both dengue and malaria infections are the same which is through combating vector mosquitoes, then there is a great deal of interest to study the integration of the two diseases. Therefore, the control of dengue should be integrated into the malaria control program in Tanzania. It is widely believed that greater alignment and synergy achieved through integration enhances the quality of care, efficiency, and patient satisfaction (34); an integrated service has in place the existence of mechanisms to bring together different health

care providers (e.g. health committees); a close relationship between health centers and the district hospital; and joint efforts across sectors.

The following sections discuss the integration of dengue control into malaria control program as guided by specific study objectives:-

2.1 The organizational factors for integration of dengue control into the malaria control program.

The literature review has shown that the organizational factors that facilitate integration include but not limited to; policy, guidelines, organizational structure, organizational culture (vision, mission, and goals of the organization), organizational infrastructure, human resources, financial resources, cost-effectiveness, and donor support for integration.

Globally, the presence of different International policies, strategies, and guidelines, and conventions for integration have influenced the integration of various services and programs in the health sector. For example, the presence of WHO policy on collaborative TB/HIV activities, guidelines for national programs and other stakeholders, policy handbook for integrated vector management, integrated care for older people (Guideline on community-level interventions to manage the decline in intrinsic capacity) have all played a great contribution in various countries such as Tanzania, Niger, and South Africa. Another study done in the USA by (31) reports that there were more examples of policies in favor of integrated services that supported the implementation of health services. It involved a mix of political, technical, and administrative action. Potential forces for "disintegration", such as powerful interest groups or tightly earmarked funds that encourage the development of parallel management systems, may have to be actively managed. The USA study further mentioned that the commitment of top management in supporting the integration to be a significant aspect of the integration of management systems or health services in general.

Some studies done elsewhere in the world mentioned overload of the present health care workers to be one of the important factors to be taken into consideration during integration. For example, they mentioned that the integration of family planning services, antenatal, and delivery care areas necessary for primary level health workers (28) posed a risk of overload to

health workers. This should be taken with care as it might overwork the present few workers leading to poor health quality.

Other studies reported that top management support and close relationship with the units or departments responsible for integration may help in the process of integrating some of the services or units.

The studies have mentioned, for instance, the effective relationships between the highest-ranked IT manager often called the chief information officer (CIO) and the top management team (TMT), including the chief executive officer (CEO), may offer a key contribution to innovative strategies and growth in the e-business era (35,36). The top management relationship with other units or programs can facilitate a smooth integration of the programs and hence speeding up the process.

In the Sub-Saharan African perspective, different policies, strategies, and guidelines in Sub-Saharan Africa recognize integration as a way of ensuring the quality of care, efficiency, and patient satisfaction (37). In South Africa, policies at all levels since 1994 have supported moves towards integrating Primary Health Care services in various forms. In South Africa, integration is a health sector reform priority, while several vertical programs exist such as HIV, tuberculosis (TB), and maternal and child health- MCH (38). The study further reported that the HIV program was introduced soon after 1994 with earmarked funding (39) and later a conditional grant (40), as well as a dedicated M&E system (41). This integration was possible due to the presence of the supporting policies for integration.

In Ghana, Kenya, and Zambia all governments and donor decision-makers have supported the international rhetoric on integration while being aware of the obstacles at the national level (42). One of the obstacles mentioned was the national policies that do not support the integration of programs or services.

Another study (29) reported that the policy change on malnutrition in Niger promoted the integration of acute malnutrition into the national health system. This policy change came in

response to concerns raised by malnutrition. The policy called for the delivery of integrated management of acute malnutrition (IMAM) in all public health facilities.
It allowed rapid geographical expansion and aimed at resolving access, quality, and coverage issues. As part of a community-based program in Niger, support for an integrated approach was generated through existing community structures, including ward development committees, as well as through outreach in markets, places of worship, and at the household level (29). Governments, donors, and service delivery groups must work together to ensure stakeholder support and to implement strategies to avoid or quickly address negative perceptions of integration.

In Tanzania; a study on the integration of HIV and TB services (43) reported that support from donors such as PATH has contributed much to the integration of the program of HIV/TB. Furthermore, the study reported that Tanzania's MoHCDGEC has several policy documents that touch on the issue of integration. These documents include Tanzanian National Health Policy Document of 2003, the Tanzania One Plan/National Road Map Strategic Plan, Maternal and Newborn Health 2008–2015, the Tanzania National Package of Essential Reproductive and Child Health Interventions (2000) as well as National policy Guideline for collaborative TB/HIV activities.

All these policy documents have fostered the implementation of standardization of the integrated services.
A study by Bruce reported that an enabling environment where providers have a regular supply of essential drugs for HIV/TB was a key for the integration of HIV/TB. Integrated procurement and supply of essential drugs and commodities for multiple services are necessary. Strategies to curb frequent stock-outs need to be in place (44). The same study revealed that the development of common treatment strategies such as better targeting of multi-agent drugs to needy populations enhances integration. Furthermore, UNAID reports showed that the government of Tanzania has prioritized the integration of TB services with HIV services to minimize the burden of these two co-morbidities. Ensuring that people living

with HIV are on antiretroviral treatment means that they are in a better place to fight for TB infection. Integrating these two services will also ensure greater access to TB treatment (45). Another study conducted in Tanzania reported that Tanzania has an international assistance environment that enables Reproductive and Child Health Integration, with numerous players and many different activities taking place at different levels of the health system at the national, regional, and district levels and within individual health facilities. Efforts to improve the health of women and children were being supported at the highest levels, through major bilateral contributions to the "Tanzanian Poverty Reduction Strategy" and country-level sector-wide approaches (SWAP) mechanisms. Financial and technical support for RMNCH is also channeled through the ONE UN (WHO, UNFPA, UNICEF, UNAIDS) and core support to MOSHW budgets (8).

Different studies have been conducted to show the integration services report that identifies some organizations support the integration of the program such as HIV/TB services reported and integration of family planning services, antenatal and delivery care. Giving a result on the integration was possible due to the presence of the supporting policies for integration, support to MOSHW budgets, sufficient human resources etc. However, little is known in Tanzania on how these organizational factors can influence the integration of dengue control into NMCP. This objective intends to fill this knowledge gap.

2.2 The individual factors for integration of dengue control into the malaria control program

Globally, various studies revealed that skills for service providers and managers were very important for the integration of various services and programs. Although clinics and staff were made ‘‘multi-purpose’’ in a variety of ways, there was still a need for additional training and skills development for health workers and managers (27,28). For example, the study mentioned that Skills in the provision of family planning services and antenatal and delivery care areas were necessary for primary level health workers as skills for carrying out

sterilization, hysterectomy, gynecological surgery, emergency obstetric care, and treatment of breast and cervical cancer at secondary and tertiary levels.

In this sense, the vision of the multipurpose health worker carrying the weight of more and more types of service should be rejected. Instead, a broad grounding in sexual and reproductive health needs, combined with some form of specialization, is probably required for all three care levels, starting with medical education.

Another study done by Lloyd in the USA reported that those individual factors such as hearts and minds which together lead to full commitments were essential in the development of integrated health services.

Various studies have mentioned interpersonal relationship also to support the integration of certain services such as effective relationships between the highest-ranked IT manager, often called the chief information officer and the chief executive officer may offer a key contribution to integrative innovative strategies and growth in the e-business era while integrating IT (30). Another study reported that the growing interest in inpatient(clients) experience as a dimension of quality of care may influence the integration of some services as required by customers (27).

In Sub-Saharan Africa's perspective; the study (29) revealed that the integration of acute malnutrition interventions into the national health system in Niger was facilitated by the presence of multiple training opportunities improved skills and quality of care, boosting confidence and motivation, and creating career development opportunities. Partners dealt with bottlenecks in supply management, reporting, training, supervision, and cost recovery. Health workers new skills to screen and diagnose acute malnutrition based on anthropometry and clinical signs, triage for referral based on SAM-specific danger signs and appetite test results, initiate and monitor treatment based on weight, keep SAM-specific medical records, and do weekly and monthly reporting influenced the integration (29).

In Tanzania; The report from MoHCDGEC reported that motivation, provider knowledge, and skills among staff are contributing factors that affect Reproductive and Child Health Integration in Tanzania (8). The presence of skilled staff, high motivation, knowledge, and morale among staff could foster the integration of services to run smoothly

A study done in Tanzania reported that integrated training courses for RMNC health, as well as appropriate pre-training courses in RMNCH that address a holistic approach to treatment instead of treating a disease or condition alone, enabled the integration of Reproductive and Child Health (8). Provision of training to health providers such as nurses, doctors facilitated them to expand knowledge and add more skills to integrated reproductive and child health (8). The same study reported that the presence of motivation factors such as house, bed, mattress, household equipment, plus TZS 500,000 as a starter pack for new employees enable them to stay, adopt integrated reproductive and child health in morale in Tabora. In Rukwa region, the government offered houses for all newly posted staff, purchased basic household things, money to settle in, and made sure the houses had electricity and water. The same study reported that in Dar-es-Salaam; Labor ward staff were given special extra duty allowance for motivation, depending on the number of deliveries ranging from TZS 20,000 to TZS 50,000 per month. These motivational factors enhanced new employees to adopt and accepted the program easily (8).

In light of this, some studies have reported the individual factors during the implementation of integration of different vertical programs. As there is a need for additional training and skills development for health workers and managers, extra duty allowance for motivation is important. But little is known on the individual factors that influence the integration of dengue control into NMCP which can help to facilitate the integration and ensure cost-effectiveness and well utilization of resources by minimizing the resources needed to start a new program. Given that Tanzania has not yet implemented integration of the vector control program, this objective intends to fill that knowledge gap.

2.3 The technical factors for integration of dengue control into the malaria control program

Globally, Current business research indicates a growing trend towards information technology (IT), and the world has driven collaboration strategies (integration) among manufacturers, suppliers, and distribution channels. One such growing strategy is virtual integration. It refers to an organizational strategy of integrating its internal functions to both its suppliers and distribution outlets. It is a process of coordination across organizational boundaries to achieve operational efficiency and customer responsiveness (30). Integrated organizations rely on inter-organization information networks to obtain an on-time delivery of raw materials continuously. Companies, organizations, and the public tend to use information technology (IT) driven integration to bring new products to market faster than their competition (30). Another study done by Lloyd reported that there were many aspects to be considered for integration and technical factors were one of the aspects. He argued that the technicality of certain things does or does not allow integration (31).

Technological interfaces, in particular, play an increasingly crucial role in innovation-oriented organizational integration. In the last decades, the evolution of IT has enabled an unpriced-dented integration of processes and information flows, both within and across organizational boundaries (30). Today, internet-based systems are the key enablers of social connectedness in business environments. Also, the implementation of some new technological interfaces, such as enterprise resource planning (ERP) systems or e-business platforms, results in gigantic cross-functional projects in which cross-functional teams of IT people must bridge organizational silos (30). For these reasons, effective relationships between the highest-ranked IT manager, often called the chief information officer (CIO) and the top management team (TMT), including the chief executive officer (CEO), may offer a key contribution to innovative strategies and growth in the e-business era (30).

In the Sub-Saharan African perspective in Africa, it was reported that comprehensive information available, information sharing; developing information systems that facilitate information sharing among agencies and service providers was a key factor for enhancing proper integration of services and programs (46).

Tanzania; The study conducted by Smith indicated that the health information system is a very important key in the integration of health services such as reproductive and child health. The Tanzanian government has implemented a Health Management Information System (HMIS) to supply each level of the health sector with the necessary information in a timely and accurate manner. Through the health information system, the government enables to capture of most indicators to reduce multiple registers (47).

Another study indicated that the use of mobile technology to capture and send data from lower facilities to the districts enhanced integration of RCH services. The same study reports showed that for referral and sending data, mobile technology was used from a lower level to districts as well as reliable transport for the referral at all health centers (8).

Another study reports indicated that international organizations such as WHO, UNFPA, UNICEF, UNAIDS have played a great role in technical assistance and guidance (Technical working groups including technical advisors, technical leadership) for both HIV/TB and reproductive and child health integration in Tanzania (48).

Technical factors rely on inter-organization information networks to obtain information on time. In the health system, it can help to know the health status of their people in different health indicators by collecting the information and sending report data. This was also seen to be important on different studies reports for different programs. Smith reports that the Health information system is a very important key in the integration of health services such as reproductive and child health. However, little is known in Tanzania on how these technical factors can influence the integration of dengue control into NMCP. This objective intends to fill this knowledge gap**.**

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area

The study was undertaken at NMCP in Tanzania. The NMCP works across the whole of Tanzania in malaria interventions. Tanzania is found in East Africa and is located along 6'00,'S to 10'00's latitude experiencing a tropical climate with two spelled seasons. The long dry season between May to October followed by the rainfall season between November and May. Tanzania has a population of about 54 million whereby most of them belong to middle and low social-economic levels (49). NMCP is the National Malaria Control Program and it is under the Directorate of Preventive Services in the MoHCDGEC. NMCP is responsible for designing malaria strategic plans, developing guidelines, mobilizing resources, facilitating implementation, and M&E on progress on malaria control interventions. Additionally, the NMCP has been implementing the integrated vector malaria control program of which focuses on the consolidation and expansion of the IRS in epidemiological and operational suitable areas. The NMCP has also been implementing larviciding interventions in selected urban areas where breeding sites are few, fixed, and findable. NMCP promotes effective environmental management for malaria control amongst targeted communities. All of the above methods to control malaria seem to be more relevant in controlling dengue mosquito (50). Looking at the dengue control in our country, the government has not set long-term strategies for dealing with the prevention or control of dengue mosquitoes other than ad-hock approaches like giving statements spreading in social media tips and writing for people when there is an outbreak. Therefore, this study had to assess the factors for integrating dengue mosquito control into malaria control program.

3.2 Study design

A cross-sectional exploratory study design was used whereby a qualitative approach was applied in data collection and analysis of data related to the study objective.

According to Yin (51), an exploratory case study is appropriate when studying little understood real-life phenomena where the researcher has no control over the behaviors and actions of the study population. This design was used to explore the factors that influence the integration of dengue control into the malaria control program in Tanzania.

The study was based on the experience and decisions of the key informants related to study objectives on the organization level, individual and technical factors that influence the integration of dengue into NMCP.

3.3Study Period

Data collection was conducted from the third week of July 2020 to the fourth week of July 2020.

3.4 Study population

Participants in this study included those who were directly involved in the implementation of the NMCP program at the national levels. These were the Directorate of Preventive Services in the MoHCDGEC, the professional at NMCP management level, employees directly working on the malaria vector control intervention in NMCP, and all key informants who added relevant information to the study. Other participants were the employees in the NTD program and epidemiologist in the MoHCDGEC.

3.5 Sample size

A total of 15 informants were involved in the study, where it included five members from the Directorate of Preventive Services MoHCDGEC (including members from the administration level, epidemiology department, and Monitoring and evaluation). Seven members from NMCP (including members from the vector control unit, Administration level, case management unit, and Monitoring and evaluation unity) as well as three employees in the NTD program were also part of the sample size.

Table 1: Study participants characteristics

	Directorate of preventive services (MoHCDGEC)	NMCP	NTD-program
Total Interviewed	5	7	3
Age ≤ 35	1	2	2
≥ 36	4	5	1
Sex;			
Male	4	6	3
Female	1	4	0
Level of education;			
Bachelor Degree	5	7	3
Work experience (duration)			
2-3 years	1	0	0
4-5 years	2	2	1
6-7 years	2	2	0
Above 10 years	0	3	2

3.6 Sampling method

Purposeful sampling was used in getting key informants (53). Participants with rich information were selected based on their understanding of methods to control malaria and dengue and their roles in designing malaria strategic plan, developing guidelines, mobilizing resources, facilitating implementation, and M&E on malaria control interventions.

3.7 Data collection Methods

Data collection was conducted by using a qualitative method, a key informant interview guided by a semi-structured interview (SSI) guide. The SSI comprised of questions framed around themes originating from the three specific study objectives. The information obtained was used to answer the organizational factors, individual factors, and technical factors for the integration of dengue control in the National Malaria Control Program (NMCP).

Data Collection Instruments/tools

The interview guide was used by factual questions that were asked about experiences, views, and opinions about the objectives. The questions were asked to assess the three study objectives. The KIIs were conducted in private rooms convenient to the informants at their offices. The interview was audio-recorded, each KII lasted between 35 and 45 minutes for every respondent to complete the interview. A researcher accompanied by a research assistant was conducting the KII while the RA was recording the interview using a digital audio recorder. Then, all the audio-recorded interviews were transcribed through the use of the F4 programmer, and transcripts were then be imported to NVivo software for coding and sorting. The interviewer was free to probe and explore different aspects of the study.

The interview guide was developed in English, was later translated by the author into Swahili to ensure that participants understand the content and be able to respond correctly. This technique was employed to ensure good understanding and get the right answers from respondents as the approach used familiar language to the informants.

3.9 Recruitment of research assistants and training

One research assistant was trained to assist in data collection, together with the Principal Investigator (PI). The role of RA was to take spoken notes and audio recordings of the interview while the PI was to administer the interview. The background education of RA was a diploma in health-related education and this was an advantage for data collection because of a high understanding of the purpose of the research. There was a one-day training to help the research assistants and Principal investigators understand the purpose, aims of the study, and be able to ask correctly.

The training was conducted by the researcher and the scope of training included; research questions to be answered, objectives of the study, study area, and study population, data collection procedure and tools, the importance of confidentiality, ethical consideration, and timeframe.

3.10 Data Management

All data that was generated from the Key informant interviews were audio-recorded and spoken notes taken.

Recorded scripts were checked and cleared daily after every interview for consistency and improvement to ensure its quality, correctness, and completeness. This was done to ensure that all information from the interview is recorded and documented effectively. Management of data was at a high level of confidentiality, only those directly involved in the study had access to the collected data and that consent was secured from respondents to ensure the protection of both researcher and participants. Tape recorders with Audio-recorded data and other collected data were kept in a safe box accessed by the principal investigator alone.

3.11 Data analysis

A total of 15 Key informant Interviews were audiotaped, audio-recorded and spoken notes were transcribed verbatim before analysis. After data collection based on three areas of the study, a thematic analysis approach was used as the theoretical framework to analyze the data of the organizational, individual, and technical factors that influence the integration of dengue control into the national malaria control program were assisted by NVivo software (QSR-international) version 12. This approach was selected due to its flexibility and its step-by-step interconnected stages that guide the analytical process. Previous research (51) had emphasized the rigor and transparent nature of this approach as demonstrated by its use of the matrix structure.

The transcribed data were analyzed through the categorization of the gathered information. The analysis was carried out in three stages suggested by Virginia Braun and Victoria Clarke (54) first, Verbatim transcription of audio recording, second familiarization of data through reading and re-reading of transcripts, and also listening to the audiotapes with the key informant interview. Thirdly the line-by-line coding of field notes and transcripts by underlining the key information; Fourth, the in-depth examination and interpretation of the resultant codes and their categorization into themes; and fifth, the development of an overarching theme. The coding involved the development of concepts, i.e. the data was split

into discrete elements to expose underlying thoughts and meanings. The generated codes were further interpreted and categorized into descriptive codes. These latter codes were further distilled into abstract analytical themes around results to be presented. Other themes that emerged upon analysis were also incorporated as part of the findings.

3.12 Ethical issues

Ethical clearance was obtained from the Muhimbili University of Health and Allied Sciences (MUHAS) Research and Ethics Committee (REC). After obtaining ethical approval and an introduction letter from the Director of Postgraduate Studies, further permission was obtained from Permanent Secretary, in the MoHCDGEC to conduct a data collection in the Directorate of Preventive Services and NMCP.

Each participant in the study was provided with written informed consent that explained study objectives, methodology, risks, rights, and benefits to each study participant. Only study participants who agreed to sign the consent were interviewed and they were free to withdraw from the study at any point in time. Participants were not given any incentives for taking part in the study. Confidentiality was observed throughout the study where no participant with identified information was recorded. Participants were informed about the objectives of the study and their participation was voluntary and in a comfortable place identified by participants themselves.

All respondents were requested for their permission to record information through audio recording and writing during the interview process and that they were informed upfront that information generated was strictly to be used for research purposes only. There was no risk involved in participating in this study.

3.13 Dissemination Plan.

The findings of this study will be submitted and presented to the examination panel of the School of Public Health and Social Sciences in Partial/Fulfillment of the Academic requirements for the award of the Master of Science in Project Management Monitoring and Evaluation in Health.

The findings from the study will also be discussed with Preventive Services in the MoHCDGEC and NMCP at the management level.

3.14 Study limitations and mitigation

Risk of bias: Since the study included NMCP managers involved in implementing and managing the NMCP strategic plan, there was a risk of information bias from participants giving their views and ideas of the factors that could influence the integration of dengue into NMCP rather than facts. To mitigate this bias, the first researcher clearly explained to them the importance and objectives of this study so that they understand and provide facts. Furthermore, the triangulation of informants had offset this risk.

The trustworthiness of this study findings was enhanced through the four Guba criteria; credibility, transferability, dependability, and confirmability (55). The purpose of trustworthiness in qualitative research was to support the argument that the inquiry findings were worth to be paid significant attention to.

Credibility refers to how harmonizing the findings of this study will be with reality. In this study, credibility was ensured through data collected by well-established qualitative data collection methods as revealed from the literature. The data collection methods key informants' interviews using semi-structured interview guides.

Requesting of consent before the commencement of interviews the informed consent to participate in the study, the potential study participant and provide adequate information regarding the study and all of his/her questions about the study and rights to participate, encourage the participant to be honest and informed that they could withdraw from the interview or discussion at any time.

Also, using Interactive questioning by using probes based on the participant's response during the interview to ensure depth, consistency, and clarity of the gathered information close to the end of each interview and gave a summary of the gathered information in a written-on field notebook and asked the participants whether it was what they had said.

Lastly, the data collection process was conducted hand in hand with data analysis, and data collection was stopped when the saturation of information was attained.

Transferability is concerned with the extent to which the findings of this study can be applied to other situations. In this study, transferability was ensured by researching the contextual factors for the integration of Dengue control into NMCP. This was focus on; the information concerning the organization factor, individual factors, and technical factors.

Dependability means if this study is to be repeated, in the same context, with the same method, and with the same participants, similar results will be obtained. For this study to be dependable was to ensure the overall study design, data collection methods, and processes are described in detail. For the individual sub-studies, study design, study settings, study population, data collection methods, procedures, and data analysis is explained. Besides, presented data collection tools (semi-structured interview guides) are and the probes.

Conformability is the degree of neutrality or objectivity in the findings of qualitative studies. It means that the findings obtained from the study are based on participants' responses and not any potential bias or personal motivations of the researcher. This study is confirmable by ensuring all Data collection methods by the usage of research assistants who helped to minimize the researcher's bias. Last, the combination of inductive and deductive analytical approaches in the overall study is another strategy used to ensure that the findings reflected the participants' experiences.

CHAPTER FOUR

4.0 STUDY FINDINGS

4.1 Overview

The purpose of this study was to explore the organizational, technical, and individual factors for the integration of dengue control into the malaria control program in Tanzania. The study grouped the factors into two broad themes; facilitators for the integration of Dengue into the National Malaria Control program and the barriers for the integration of Dengue into the National Malaria Control Program. In each of the broad themes, the study organized themes around the objectives of this study (Table 2.1).

4.2 Facilitators for the integration of Dengue into the National Malaria Control Program

This analysis unveiled three themes which were organizational facilitators, individual facilitators, and technical facilitators for the integration of Dengue into the National Malaria control program. Each theme was followed by several sub-themes.

4.2.1 Organizational facilitators for the integration

From the analysis of the interviews, the theme was backed up by five sub-themes; adequacy of human resources to support integration, the existence of defined organizational structure, the existence of policy and guidelines, availability of funds for integration, and Stakeholders interest.

Table 2: A summary of themes and sub-themes

Sub-themes	Themes	Broad themes
Adequacy of human resources to support integration *Existence of defined organizational structure* *Existence of policy and guidelines* *Availability fund for integration* *Stakeholders interest*	Organizational facilitators for the integration	Facilitators for the integration of Dengue into the National Malaria Control Program
Adequacy knowledge and skills in controlling dengue and malaria *Positive perception and attitude towards integration* *Motivation towards integration*	Individual facilitators for the integration	
Existence of the system for reporting *Adequate technical devices* *Adequate tools for data collection*	Technical facilitators for the integration	
Perceived additional cost *Perceived Varying Donors interests* *Perceived additional workloads*	Organizational barriers for the integration	Barriers to the integration of Dengue into the National Malaria Control Program
Perceived negative attitude	Individual barriers for the integration	

4.2.1.1 Adequacy of human resources to support integration

The majority of participants felt that the integration of dengue control in NMCP is possible because the organization has adequate human resources that can support additional tasks once the integration has been done. The study findings further revealed that, as dengue and malaria are both vector-borne diseases, the available human resources will not need much training to carry additional tasks. However, refresher training and other capacity programs could be proposed and carried out to improve the efficiency of existing staff. The study findings further indicated that to strengthen the vector control unit within the ministry, there is a need to have staff who would supervise all programs concerning vector at the council level while at the same time using the same staff who have already been employed by the government.

> *Director has a plan to use the same human resources from NMCP to strengthen vector control unit within the ministry. and they have directed all councils to have staff who supervise all programs concerning vector such as to identify all types of mosquito and its quantity. People have been empowered to do that job...the same people employed by the government and they are being paid a salary by the government can do such a task. The government can add such tasks to them and they can do it, we don't need to deploy new employees"* **(**K2)**.**

4.2.1.2 Existence of defined organizational structure

The study has revealed that there is a possibility of integrating dengue into the NMCP program based on the existence of a similar defined structure within the organization. Findings from the study indicated that there is no need to change the structure, the structure should remain as it is, because there is a malaria vector control unit in NMCP which has similar vector control as dengue. Concerning the establishment of a specific unit of vector control, it was found that there was no need to add units or departments because the unit for vector control was already established in December 2019 under the DPS office for prevention and control of all vectors including dengue. The main challenge has been how the government should make it better and effective. To stress this, one informant stated:

> *"There is no need of changing the structure of the unit because we all deal with vectors and we have already had a unit of malaria vector control in NMCP which performs some of the activities … other than adding a small number of the staff"* (K9).

Another participant insisted that;

> *On my side, that unit exists, no need to add units at NMCP. The unit for vector control has already been established since December 2019 under the DPS office for prevention and control of all vectors including dengue.*

4.2.1.3 Existence of policy and guidelines

The study revealed that the integration of dengue in NMCP is viable because the MoH has already developed guidelines and policies such as guidelines to control all vectors, NMCP guideline as well as health policy. On another note, the study showed that there should be a use of vector control guidelines for both dengue and malaria combined. The informant noted that the existing health policy can be used, there would be no need to change it when the integration of dengue into NMCP is done.

> *"There is a guideline developed by MoH to control all vectors, it can be used to control malaria and dengue but the same policy can be used, but the policy should remain as its"* (K1).

Some informants added that there was a need to review the existence of NMCP guidelines to integrate some of the dengue interventions.

> *'There shall be changes because the guideline talks only on the control of malaria, therefore there must be a review to talk about both vectors by indicating who shall do, and what is needed but the policy in the health sector is one"* (K12).

4.2.1.4 Availability of funds for integration.

The findings from the participants revealed that the integration can be done through the funds from NMCP, which can be used to control both dengue and malaria, once the integration has been done. The respondents added that during the outbreak of dengue the resources used for ad-hock activities to control dengue came from NMCP within government sources of funds

and were not from donors. This was an indication that integration is possible. Furthermore, this will reduce and avoid the double allocation of resources.

> *"Funds for running the vector unit comes from NMCP, the integration reduces the cost and enhance better use of resources in terms of finance and human resource"* (K1).

4.2.1.5 Government Stakeholders interests

Majority of the participants reported that stakeholders like policymakers, Scientists, politicians, government, and some funders will be interested in the integration. This is because dengue has public interest and when it comes to interventions that are used to control both diseases, there is an indication that there is enough support.

> *"Dengue fever is a disease which has neither project nor resources when the outbreak occurs, it becomes like ad-hock. It has no strategic plan and most stakeholders have no interest in diseases like dengue fever and this is a challenge. When the outbreak occurred, the MoH mobilized its resources from various sources. As the ministry, we are interested in all diseases but the resource is a challenge due to priority, that is why we are dealing with them as the ad-hock when occurs"* (K7).

4.2.2 Individual facilitators for the integration

This analysis unveiled three sub-themes that were grouped under facilitators for the integration of dengue control into the malaria control program. These were adequacy skills and knowledge on the control of dengue and malaria, motivation towards integration, and positive perception, and attitude toward integration. ***(Table 2.1.)***

4.2.2.1 Adequacy skills on controlling dengue and malaria

The majority of participants expressed that the integration of dengue control into NMCP was possible because staff/human resources who have adequacy skills on the methods to control both malaria and dengue have similar if not related control methods.

The available human resources would require refresher training on the methods of controlling dengue to all members who were directly involved in controlling malaria vectors from the ministry level to the council level.

> *"As I know NMCP department has experts with adequate skills for doing vector control but also DPS has a plan to strengthen the unit through adding knowledge to those professionals who have specialized on vector control"* **(**K2).

4.2.2.2 Adequacy knowledge on controlling dengue and malaria

Majority of the participants stated that the integration of dengue into NMCP can be possible since most of the employees from the ministry level have adequate knowledge of the methods of combating a mosquito case. Other participants insisted that there is no big difference between malaria and dengue because the implementers are medical personnel. During the outbreak of dengue, the same personnel from the malaria control unit, with the same knowledge and experience, were deployed to combat the dengue outbreak. This indicated that there was at least adequate knowledge to control and combat dengue by using the same staff/resources from the malaria control unit. Also, they added that there will be a need to conduct on-job training to refresh about the extra behavior of dengue mosquito because it (dengue) has extra behavior which malaria does not have especially during an outbreak. Also, the findings showed that staff within the malaria unit have adequate knowledge including how to spray dengue larvae during an outbreak.

> *"I think there is no need of education for controlling dengue because there is no treatment for dengue maybe when there is outbreak it is where you can provide education on how to manage dengue...but if it is the issue of spraying dengue larvae, staff have that knowledge...but also to establish a unit for dengue, malaria, etc."* **(**K13).

Another insisted that:

> **"***I think there is a strong effort to control dengue in NMCP and people are much aware of malaria and dengue control even during the outbreak of dengue people came with their methods to control dengue…. I think there need to scale up the knowledge at low level and ministry level."* **(**K11**).**

4.2.2.3 Motivation towards integration

The majority of the participants claimed that the integration of dengue into malaria in NMCP was an important and possible step because there was no extra motivation needed to human resources during the integration. They also added that, as much as dengue was a field-oriented activity, then the same human resources can be utilized. Furthermore, the participants revealed that most of the human resources would remain in their positions, for example, the focal person of a particular unit will remain as a focal person except that the dengue program can only be integrated into the unit. So, no extra motivation was needed apart from ensuring the availability of tools and refresher training to staff.

> *"Doing intervention is like doing two things… is like doing supervision, you can use one car for two tasks but when you are doing vector control activities, it is field-oriented. Therefore, great motivation is to ensure that people are facilitated in transport and tools/equipment"* **(K10).**

4.2.2.4 Positive perception and attitude towards integration

Findings from the majority of participants expressed that the integration of dengue control in NMCP was possible since staff/human resources have positive perceptions and attitudes toward integration**.** The informants added that the perception, attitude, and mindset of the workers from different levels of implementation towards the integration of dengue control into NMCP will be positive because they will control two diseases at once. The respondents reported that at the council level, such kind of integration is not new because it has been done before. For instance, familiar diseases like TB and HIV and RCH services were integrated into one program due to similarities. Given such a case, there is a positive perception and attitude towards integration to the same programs between malaria and dengue. Also, the findings showed that it will be possible since there is no reduction in the employees like the experience from other integrated programs such as NTD.

> *"The Perceptions will be good because it will be killing two birds with one stone"* (K12).

Another informant added that

> *"I think on lower levels the implementation will be easy because they have already experienced the issue of integration on different diseases such as TB and other RCH services, hence those things exist* (K6**).**

4.2.3 Technical facilitators for the integration

This analysis unveiled two sub-themes that were grouped under facilitators for the integration of dengue control into the malaria control program. These were the existence of the system for reporting and adequate technical devices ***(Table 2.1).***

4.2.3.1 Existence of the system for reporting.

The findings from informants in this study reported that the integration of dengue control in NMCP was possible because the organization has a system for reporting that can support reporting lines for both dengue and malaria. In Tanzania, the government has one system called DHIS for reporting all diseases including malaria and dengue.

> *"The reporting system exists and it's called electronic disease survey system on which people report through phone, dengue is one of which are supposed to be reported. People are required to report, no need for the addition of a new system. People who are dealing with malaria must be told to increase reporting because the system exists. The platform is there, you can report to IDSR through phone or DHIS"* **(**K10).

However, the informants in this study added that there was a need for some review of the reporting system to add some of the interventions and indicators which were not available for dengue control interventions.

> *"I think there shall be an addition of a new intervention in DHS 2 from the health facility to the ministry level. The existing system is enough but there is a need to add new indicators to DHS 2 A and no need of expertise"* **(**K14**).**

4.2.3.2 Adequate technical devices.

The majority of participants revealed that the integration of dengue control in NMCP was feasible as the organization has adequate tools such as computers, internet systems, and technical staff that can support reporting and data collection once the integration is done. The informants of the study reported that there would be no need for many additional devices such as computers because the existing devices are enough once the integration is done. For example, at the district level, they are using MTUHA focal person and coordinator of malaria who both have computers and other IT facilities.

> *"No need of additional devices, the same devices can be used such as computer to all levels from ministerial level to a low level"* (K5)

4.2.3.3 Adequate tools for data collection

Informants from this study revealed that the integration of dengue control in NMCP was possible because the organization has adequate tools for data collection. The same tools used to deal with malaria can be used for the data collection on dengue cases. They added that the existing tools need only some additional indicators of dengue which were not available on these tools and thereafter providing an orientation on the additional indicators.

> *"No need to change tools, the same tools can be used but it requires to add dengue indicators because the existing tools have no such indicators"* ***(K7)***

On another note, the respondents added that they can improve reporting of dengue because the system exists and it supports the integration of dengue. The platform is available and can be used to report IDSR through phone or DHIS.

> *"People who are dealing with malaria must be told to increase reporting because the system exists. The platform is there, you can report to IDSR through phone or DHIS" (K2)*

4.3 Barriers to the integration of Dengue into the National Malaria Control Program

In this analysis, the study also unveiled three themes which were organizational barriers, individual barriers, and technical barriers for the integration of Dengue into the National Malaria control program. Each theme was followed by several sub-themes.

4.3.1 Organizational barriers for the integration

From the analysis of the interviews, this theme was backed-up by three sub-themes of perceived financial cost to support integration**,** varying donors' interests, and Perceived additional workloads.

4.3.1.1 Perceived additional cost

The findings from some of the participants reported that there would be additional funds for the integration of dengue interventions in NMCP. These perceived financial costs included; fund for buying some equipment, additional costs for interventions which were not allocated and budgeted in malaria control programs, additional fund to assist the integration of the dengue as well costs for training of human resources. In the sight of respondents, these perceived costs will be minimal in comparison to the establishment of the fully-fledged dengue control program.

> *"There will be additional funds for interventions that are not present in malaria, for example, spraying medicine at home that does not affect malaria., There is a need to organize training on human resources which in turn will need more funding. The only part that can be used for the same funds within the intervention of larvicide and of which it is not supported by donors but by the government itself"* **(**K10).

4.3.1.2 Perceived Varying Donors' interests

Because of donors' interests, the majority of the participants reported that stakeholders and some donors would not be interested in the integration of dengue and malaria since they have their interest and target of funding their interventions which might not necessarily and directly related to control of dengue interventions. The findings revealed that some of the donors would provide funds for malaria, TB, and HIV but not dengue.

"I think there is a great deal of interest within government on dengue…but there is a challenge to most of the donors at NMCP who do not have interest with some of the intervention on dengue, for instance, there are donors like PMI and Global Fund….issues like the support of mosquito net seem to be within their interest but they cannot support Larvicide which can control dengue. Stakeholders who fund intervention related to dengue and malaria control can agree to integrate because if you integrate and achieve more than you what it is a credit…the issue needs justification and convincing power." **(K8).**

Another informant added that

"On the issue of stakeholder interest, the problem comes from the side of donors who need things to match with their interest…and donors have no interest to control malaria on biolavise". **(**K12**).**

4.3.1.3 Perceived additional workloads

The findings from the participants showed that there will be a minimum additional workload for the program because some new interventions and objectives will be added to control dengue which is not the same as in malaria.

"The workload will increase but for the individual, if they will add the focal person to some of the units, the workload will never increase". (K11).

Another respondent insisted that;

*"Some of the tasks will lead to an increase in workload especially the issue of monitoring. For stance monitoring the characteristics of different mosquitoes…by looking at betting habit and betting rate if it can differ….nursery of mosquito by looking at mosquito repellent how long it takes….therefore it will two different tasks***"(K8).**

4.3.2 Individual barriers for the integration

In this analysis, the study unveiled one sub-theme that was grouped under barrier for the integration of dengue control into the malaria control program. The individual barrier was a perceived negative attitude toward integration. ***(Table 2.1.)***

4.3.2.1 Perceived negative attitude

The study findings have revealed that there would be a negative perception towards the integration of dengue in NMCP. They felt that, if there would be an increase in workload, it must correspond with increase of resources.

> *"According to my experience with MoH, when something established and there are human resources for doing such thing, there is no problem. The problem arises when there are no adequate human resources"* (K14).

CHAPTER FIVE

5.0 DISCUSSION

This study aimed at exploring the factors that influence the integration of dengue control interventions into the national malaria control program in Tanzania. Therefore, this chapter takes into account the paramount part of the findings presented in the earlier chapter. It further gives the inference of the results based on the facilitators and barriers that influence the integration of dengue into National malaria control programs. These findings were interpreted and discussed by comparing what was reported by other studies done in developing and developed countries.

5.1 The Facilitators for the integration of dengue control into the malaria control program.

The findings from this study revealed that the integration of dengue control in NMCP can be done because there is a presence of adequate human resources that can support additional tasks once integration has been done. The available human resources will not need much training to carry additional tasks, however, refresher training and continuous capacity programs were recommended. One of the study findings conducted in Tanzania which integrated reproductive and child health managed to deploy new human resources to implement the integrated program. A study done in Tanzania indicated that integrated training courses for RMNC health, as well as appropriate pre-training courses in RMNCH that addresses a holistic approach to treatment instead of treating a disease or condition alone, enabled the integration of Reproductive and Child Health (8) to be a successful program. Based on the mentioned studies, two programs have been shown to have similarities with the findings of this study where existing human resources were used for the integration of reproductive health services and child health. This similarity means that an approach of using existing human resources can be used for the integration of dengue into the national malaria control program.

It is of the view of this study that, adequacy of human resources has the potential to minimize the efficient use of resources by utilizing available human resources to implement multiple tasks. This reduces the burden of budget to establish a new program of dengue control.

However, investment in the capacity building to the same human resources would be required to ensure effective implementation of the integration and its success.

Also, findings from this study revealed that the presence of policy and guidelines such as health policy, vector guidelines and NMCP guidelines can support the integration of dengue in NMCP. The study findings revealed that vector control guidelines should be used where both dengue and malaria are within the guidelines. Some reviews might be needed for NMCP guidelines to integrate some of the dengue interventions. The study findings were contrary to the study done in Niger, which reported that the policy change came in response to concerns and challenges. The policy called for the delivery of integrated management of acute malnutrition (IMAM) in all public health facilities. It allowed rapid geographical expansion and aimed at resolving access, quality, and coverage issues (29)**.** Given this contrast, it means that human life has the upper-end over policy and guidelines in the sense that government cannot wait to finalize the policy while people are dying. The scenario has shown that in a situation where there is no clear policy, rapid measures are put in place to reflect health concerns/challenges, which in turn drive/pave the way for establishment or change of particular policy. This study is of the view that policy change has many factors and scenarios of influence and that presence or absence of guiding policy cannot be the only deciding factor to achieve an integration of programs. Therefore, the integration of dengue into the national malaria control program can be done even without changes in the national health policy.

The findings from this study have shown that stakeholders like policymakers, Scientists, politicians, and some funders including the government itself can support dengue interventions and are interested in the integration. Their interest as stakeholders is based on the fact that dengue has public interest and when it comes to interventions that are used to control both diseases there is a great deal of support. studies were done in Ghana, Kenya, and Zambia reported that all governments, donors, and decision-makers had supported the international rhetoric on integration while being aware of the obstacles at the national level(42). A study done in Tanzania reported that donors like PATH in Tanzania had contributed much to the integration of the program of HIV/TB (43). There is a similarity of stakeholders' interest in the

integration of programs that affirms the possibility of integrating dengue into the national malaria control program. This similarity indicates that there is a potential to have more support from stakeholders who have an interest in malaria to support dengue if they are convinced on the similarity of methods of control between malaria and dengue. Therefore, the study is of the observation that the same stakeholders on malaria control programs can support the integration of dengue into malaria programs.

The findings from this study found that the integration of dengue control in NMCP is viable and can be implemented because staff/human resources have minimal adequate skills and knowledge on the methods to control dengue. Some of the methods to control dengue have been indicated to have related to some of the methods employed in the control of malaria. However, the study suggests that this does not rule out the need for refresher training and other capacity-building programs to available human resources on the methods of control of dengue. Likewise, in another study conducted in Niger, it revealed that the integration of acute malnutrition interventions into the national health system was facilitated by many factors including but not limited to; the presence of multiple training opportunities, improved skills and quality of care, boosting confidence and motivation, and creating career development opportunities(29). On another note, a study done in Canada reported that skills for service providers and managers were paramount for the integration of various services and programs. Although clinics and staff were made ‘‘multi-purpose’’ in a variety of ways, there was still a need for additional training and skills development for health workers and managers(27)**.** Based on this study, there are similarities with other studies on requirements of skills development and harnessing of knowledge to motivate existing human resources as part of the integration process. The similarities provide an opportunity for integration of dengue into a national malaria control program where extensive training smooth the integration and create the pool of human resources.

Additionally, the study findings indicated that there is a possibility of integrating dengue control in NMCP because staff/human resources have positive perception and attitude towards

the integration of Human resources at council level where they have already established familiar integration of other programs like TB and HIV and RCH services. For the study conducted in Malawi, it reported that positive perception among health workers, both managers, and health surveillance assistants, had contributed much to the Integrated Community Case Management (CCM) Program for Childhood Illness in Malawi. Most participating health workers and managers responded positively to the introduction of the CCM program in Malawi, regardless of whether the district was high-performing or low-performing in terms of supervision and drug supply for CCM (57). This similarity of interventions implies that there was a proper design of integration and various staffs and units within the health sector absorbed the process systematically. Therefore, good perception stimulates and accelerates teamwork, harness creativity, and the ability to overcome unforeseeable challenges along the integration process of dengue into the national malaria control program.

Additionally, the study has revealed the possibility of integrating dengue into NMCP because the program has a reporting system that can be compatible with reporting for both dengue and malaria. In Tanzania, the government has one system namely District Health Information System 2 (DHIS2) for reporting all diseases including malaria and dengue. In another study which was done in Tanzania, it was reported that the health information system was of paramount importance in the integration of health services such as reproductive and child health. The Tanzanian government has implemented a Health Management Information System (HMIS) to supply each level of the health sector with the necessary information in a timely and accurate manner. Through the health information system, it enables to capture most indicators to reduce multiple registers (47). The study has shown that a reporting system can support dengue control interventions and therefore there is a similarity in reporting which is an advantage for an integration. Given this study, the collection and analysis of information for reporting is of paramount importance to make an informed decision. Quality reports and findings as results of integrated systems provide a space for information sharing, understanding the magnitude/trend of the diseases, and the ability to effectively control the diseases like dengue.

In terms of tools to support dengue control program, the study found that there is a possibility to integrate dengue into NMCP due to the presence of adequate tools such as computers, internet access, software and amongst others that can support in sharing information and data collection once the integration has been done. The study was done in Tanzania, which documented that the use of mobile technology to capture and send data from lower facilities to the districts' enhanced integration of RCH services. The same study reported that for referral and sending data, mobile technology was also used from the lower level to districts as well as a reliable transport for the referral at all health centers (8). Given this, similar mechanisms and resources can be integrated and be used to facilitate dengue control methods. Therefore, investment in technology for data collection and improvement of software systems to support the integration will facilitate the integration of dengue into the national malaria control program. This will provide accurate data and quality reports to inform plausible plans and executions of dengue control programs in Tanzania.

5.2 Barriers for the integration of Dengue into the National Malaria Control Program

Regarding the perceived negative attitude among staff, the study findings have revealed that it can be a barrier for the integration of dengue control in NMCP. The findings have shown that there would be an increase in workload and hence placing the dengue integration program in jeopardy into a negative attitude among staff on the program. The jeopardy of dengue integration into malaria program is supported and evinced by another study which was conducted in Tanzania where it reported that negative attitude towards TB and HIV/AIDS among health workers was one of the barrier for provision of comprehensive services to TB/HIV patients(43). From the studies and findings, there are similarities in the attitudes towards the workload increase. Nevertheless, the increase in workload can be a driving force for motivation through training, incentives, and working facilities. Therefore, it is the understanding of this study that individual attitude is one of the instrumental and integral parts of the integration of dengue control because staffs have to absorb and induce integration into their work.

In terms of additional costs to support the integration of dengue into NMCP, the study has shown some indications of a barrier if available and adequate funds are not allocated for implementation. These perceived financial costs included but not limited to; funds for buying some equipment, additional fund for interventions which were not allocated and budgeted for in malaria as well as costs for refresher training to human resources. Given cementing the argument on financial cost implications, the study was conducted in Uganda, which reported that there were financial resource-related barriers that the PCPs faced in regards to integrating mental health services into PHC. These barriers included but not limited to; inequities in funding, lack of employee benefits, lack of reimbursement for services, uncertainty about continued funding for community programs/services due to cuts in the budgets for mental health services, insufficient insurance coverage to meet the treatment option, high cost of hiring nursing and support staff (58). From this study and other studies, there are similarities in additional costs to implement the integration. This means that integration requires an assessment of cost-effectiveness and an increase in donors' interest in dengue control interventions. This will facilitate to avoid extra costs that are meant to be avoided as part of the integration of dengue into NMCP.

CHAPTER SIX

6.0 CONCLUSION

In conclusion and based on the organizational, technical, and individual factors that influence the integration of dengue control into the national malaria control program in Tanzania; integration provides multiple advantages and opportunities for increasing access, improving quality, and continuation of dengue control interventions into malaria programs. The integration experts to ensure the availability of strategic plans for dengue and avoid the diseases to be implemented as an ad-hoc activity during the outbreak. The integration also improves the efficacy and cost-effectiveness of utilizing resources within the same NMCP.

However, the government and stakeholders neither have been well prepared for dengue nor prioritize it despite having similar methods of control (with malaria) and effects on the public. It is the understanding of this study that the dengue control program should now be integrated and be mainstreamed within the frameworks of programming. The fact that there are available resources, it is an indicative factor that dengue is both integrative and implementable once integrated into NMCP.

As revealed by the findings from the study, it is important to have consideration factors that influence the integration of dengue control into NMCP in both organizational, individual, and technical. Therefore, before integrating dengue into NMCP, it will be helpful to assess the feasibility of the program and address some of the perceived barriers, which were reported in the study.

6. RECOMMENDATIONS

Based on the study findings, it is recommended that;

1. The MoHCDGEC through the directorate of preventive services and NMCP should conduct stakeholders' consensus meetings together with other partners who support financially the malaria interventions. The stakeholders' meeting could be used to mobilize the resources for the Perceived financial cost to support the integration of dengue and malaria.

2. This will facilitate the funders and other stakeholders to draw interest on dengue as part of integration into malaria programs. This will also help to raise awareness from different stakeholders on the dengue control program
3. The MoHCDGEC through the directorate of preventive services and NMCP should consider the provision of adequate refresher training and skills development programs to their employees at all levels of the health systems, which should include the importance and advantage of the integration of dengue to reduce the Perception of negative attitude toward integration.
4. Based on the possibility for integration as revealed by this study, a feasibility study is recommended for integrating dengue into the National Malaria Control Program. The feasibility study will pave the way for further knowledge to broaden the economic, managerial, and technical aspects of integration.
5. It is also recommended that research be conducted on cost-effectiveness of dengue integration into NMCP to assess, critically evaluate the benefit, and the viability of integration. This will support to give explanations on perceived costs implications as a barrier to the integration. Such a study will be useful to the directorate of preventive services, stakeholders as well as other researchers in the course of making informed decisions.

REFERENCES

1. World Health Organization. Integrated Health Services. Making health systems work. 2008.
2. Habtewold T, Povelones M, Blagborough AM, Christophides GK. Transmission Blocking Immunity in the Malaria Non- Vector Mosquito Anopheles quadriannulatus Species A. PLoS Pathog |. 2008;4(5).
3. World Health Organization. Dengue in the WHO Europran Region. 2015.
4. DEPINHO H, Murthy R, Moorman J, Weller S, Sundari Ravindran TK, de Pinho H. Integration of health services. RAVINDRAN, T PINHO, HD Right Reforms [Internet]. 2005;(January).
5. Witko A. Edited by Edited by. Vol. 3, World. 2003. 53-60 p.
6. Global Strategic Framework for Integrated Vector Management. World Health.
7. WHO. Integrating health services. Tech Ser Prim Heal Care [Internet]. 2018;1–14.
8. Mueenuddin L, Msuya S, Tech GH, Ii B. Assessment of Reproductive and Child Health Integration in Tanzania Challenges and Opportunities. 2012;(10):13–71.
9. Mutalemwa PP, Kisinza WN, Munga M, Urassa JAE, Kisoka WJ. Integrating reproductive and child health and HIV services in Tanzania : Implication to policy , systems and services. 2013;15(2):1–10.
10. WHO. Integrated vector management to control malaria and lymphatic filariasis. Wkly Epidemiol Rec [Internet]. 2011;86(20):121–7.
11. WHO. Organisms Are Small That Carry Serious Diseases. 2014;1–40.
12. Employer EO. Equal Opportunity Employer MALARIA FACT SHEET Agent: Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae, and Plasmodium ovale. Lab Perform Test Parasitol Lab Georg Public Heal Lab [Internet]. 2014;5–7.
13. World Health Organisation. Dengue and severe dengue. WHO Fact Sheet [Internet]. 2014;117(March):1–4.
14. Kuno G. Emergence of the severe syndrome and mortality associated with dengue and dengue-like illness: Historical records (1890 to 1950) and their compatibility with current hypotheses on the shift of disease manifestation. Clin Microbiol Rev. 2009;22(2):186–201.

15. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL, et al. The global distribution and burden of dengue. Nature [Internet]. 2013;496(7446):504–7.
16. Ahmad S, Aziz MA, Aftab A, Ullah Z, Ahmad MI, Mustan A. Epidemiology of dengue in Pakistan , present prevalence and guidelines for future control Epidemiology of dengue in Pakistan . 2019;(July).
17. Tk S, Tm S, Meethal KV. Effect of serine protease inhibitors on gut protease activity of Aedes albopictus fourth instar larvae. Int J Mosq Res. 2019;6(5):06–9.
18. Amarasinghe A, Kuritsky JN, William Letson G, Margolis HS. Dengue virus infection in Africa. Emerg Infect Dis. 2011;17(8):1349–54.
19. Boillat-blanco N, Klaassen B, Mbarack Z, Samaka J, Mlaganile T, Masimba J, et al. Dengue fever in Dar es Salaam , Tanzania : clinical features and outcome in populations of black and non-black racial category. 2018;18(644):1–10.
20. Mboera LEG, Mweya CN, Rumisha SF, Tungu PK, Stanley G, Makange MR, et al. The Risk of Dengue Virus Transmission in Dar es Salaam, Tanzania during an Epidemic Period of 2014. PLoS Negl Trop Dis. 2016;10(1).
21. Scott TW. Dengue. Encycl Insects. 2009;257–9.
22. The four models of integrated SRH and HIV services being evaluated. 2012;(1):1–4.
23. Warren C, Ndwiga C, Abuya T, Kivunaga J, Kikuvi J, Oteba L. Assessing the Benefits of Integrated HIV and SRH Services in Intervention Report. 2012;(June).
24. Treatment M, For C. United Republic of Tanzania and neglected tropical diseases. 2016;
25. RTI International. Tanzania Vector Control Scale-up Project : Spray Performance Report Nov 2011-May 2012. 2012;(621).
26. Management G on S of IDM on IV. A Global Review of Implementation of Integrated Vector Management. 2011;(February):24.
27. Armitage GD, Suter E, Oelke ND, Adair CE. Health systems integration: State of the evidence. Int J Integr Care. 2009;9(2).
28. Rosenfield A, Maine D. Maternal Mortality-a neglected tragedy. Where is the M in MCH? Lancet. 1985;326(8446):83–5.

29. Deconinck H, Hallarou ME, Pesonen A, Gerard JC, Criel B, Donnen P, et al. Understanding factors that influence the integration of acute malnutrition interventions into the national health system in Niger. Health Policy Plan. 2016;31(10):1364–73.
30. Abebe MA. To integrate or not to integrate: factors affecting the adoption of virtual integration strategy in organizations. Bus Strateg Ser. 2007;8(3):196–202.
31. Mwakigonja AR, Torres LMM, Mwakyoma HA, Kaaya EE. Cervical cytological changes in HIV-infected patients attending care and treatment clinic at Muhimbili National Hospital, Dar es Salaam, Tanzania. Infect Agent Cancer. 2012;7(1):1–8.
32. Rodrigues HS, Monteiro MTT, Torres DFM, Zinober A. Control of dengue disease: a case study in Cape Verde. ARTICLE. 2010;(June 2014):816–22.
33. Wong LP, Shakir SMM, Atefi N, AbuBakar S. Factors affecting dengue prevention practices: Nationwide survey of the Malaysian public. PLoS One. 2015;10(4).
34. de Carvalho IA, Epping-Jordan J, Beard JR. Integrated Care for Older People. 2019. 185-195 p.
35. Naranjo-Gil D, Hartmann F, Maas VS. Top management team heterogeneity, strategic change and operational performance. Br J Manag. 2008;19(3):222–34.
36. Feeny DF, Edwards BR, Simpson KM, Cio CEO, Edwards BR. Relationship1. 2014;16(4):435–48.
37. The health systems trust annual report 1999
38. McIntyre D, Klugman B. The human face of decentralisation and integration of health services: Experience from South Africa. Reprod Health Matters. 2003;11(21):108–19.
39. Schneider H, Stein J. Implementing AIDS policy in post-apartheid South Africa. Soc Sci Med. 2001;52(5):723–31.
40. No BB. An exploratory analysis of HIV and AIDS donor funding in South Africa. 2004;(155):1–16.
41. Oliver J. Monitoring and Evaluation of the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa TRAINING. J Chem Inf Model. 2013;53(9):1689–99.

42. Lush L, Cleland J, Walt G, Mayhew S. Integrating reproductive health: Myth and ideology. Bull World Health Organ. 1999;77(9):771–7.
43. Wandwalo E, Kapalata N, Tarimo E, Corrigan CB, Morkve O. Collaboration between the national tuberculosis programme and a non governmental organisation in TB/HIV care at a district level: experience from Tanzania. Afr Health Sci. 2004;4(2):109–14.
44. Bruce RD, Lambdin B, Chang O, Masao F, Mbwambo J, Mteza I, et al. Lessons from Tanzania on the integration of HIV and tuberculosis treatments into methadone assisted treatment. Int J Drug Policy. 2014;25(1):22–5.
45. UNAIDS. HIV and AIDS in Tanzania. 2013.
46. Zulu JM, Kinsman J, Michelo C, Hurtig AK. Integrating national community-based health worker programmes into health systems: A systematic review identifying lessons learned from low-and middle-income countries. BMC Public Health. 2014;14(1):1–17.
47. Smith M, Madon S, Anifalaje A, Lazarro-Malecela M, Michael E. Integrated Health Information Systems in Tanzania: Experience and Challenges. Electron J Inf Syst Dev Ctries. 2008;33(1):1–21.
48. Oliff M, Mayaud P, Brugha R, Semakafu AM. Integrating reproductive health services in a reforming health sector: The case of Tanzania. Reprod Health Matters. 2003;11(21):37–48.
49. URT. Tanzania Demographic and Health Survey and Malaria Indicator Survey. United Republic of Tanzania. 2015;172–3.
50. PMI. Tanzania Malaria Operational Plan FY 2015. President's Malaria Initiatives. 2015;
51. Kemenkes RI. Title. Acta Univ Agric Silvic Mendelianae Brun. 2011;16(2):39–55.
52. Mann JW. Book Review: An Introduction to Phenomenological Psychology. South African J Psychol. 1980;10(3–4):115–115.
53. Anney VN. Ensuring the quality of the findings of qualitative research: looking at trustworthiness criteria. J Emerg Trends Educ Res Policy Stud. 2014;5(2):272–81.
54. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(2):77–101.
55. Shenton AK. Strategies for ensuring trustworthiness in qualitative research projects. Education for information. 2004 Jan 1;22(2):63-75..

56. Krefting L. Rigor in Qualitative Research: The Assessment of Trustworthiness. Am J oj Occup Ther [Internet]. 1991;45(3):214–22.
57. Callaghan-Koru JA, Hyder AA, George A, Gilroy KE, Nsona H, Mtimuni A, et al. Health workers' and managers' perceptions of the integrated community case management program for childhood illness in Malawi: The importance of expanding access to child health services. Am J Trop Med Hyg. 2012;87(SUPPL.5):61–8.
58. Wakida EK, Talib ZM, Akena D, Okello ES, Kinengyere A, Mindra A, et al. Barriers and facilitators to the integration of mental health services into primary health care: a systematic review. Syst Rev. 2018;7(1):1–13.

APPENDICES

Appendix I: Informed Consent

Introduction

Dear Participant,

Greetings! I want to thank you for taking the time to meet with me today.

My name is Dorice Lyimo a student of Master of Science in Project Management, Monitoring and Evaluation in Health at Muhimbili University of Health and Allied Sciences (MUHAS). On behalf of MUHAS, I am conducting research on **INTEGRATION OF DENGUE CONTORL INTO THE NATIONAL MALARIA CONTROL PROGRAM IN TANZANIA**

Purpose of the Study: The purpose of the interview is to collect information on the factors which can influence the integration of dengue control into the national malaria control program in Tanzania, based on at the organization level, individual and technical factor. You are kindly being asked to participate in this study because we believe that you have particular information that may be important to the study.

Methods of the study: As part of the study In Depth Interview will be done and interviewer will record your responses. You will be interviewed once for approximately 35-45 minutes. Data will be collected at single point that is after this interview with you; we are done with you

Procedure of the study: information is provided for you to decide whether you wish to participate in the present study. You should be aware that you are free to decide not to participate or to withdraw at any time without affecting your relationship researcher.

Do not hesitate to ask any questions about the study either before participating or during the time that you are participating.

I would be happy to share our findings with you after the research is completed. However, your name will not be associated with the research findings in any way, and your identity as a participant will be known only to the researchers. This is for assuring your confidentiality as my informant.

The expected benefits: There are no direct benefits for your participation however, information you provide will facilitate/influence a planning for more efficient ways of combining integrated malaria and dengue vector control strategies through NMCP in Tanzania, since controlling the spread of dengue still requires that mosquitoes be targeted directly so as to improve resources utilization of the program rather than having two program which will have aim combat vector mosquitoes. Also Dengue virus mosquito also transmits chikungunya, yellow fever and Zika infection. Therefore the need of integrate dengue in NMCP will also help to control disease like yellow fever, chikungunya and Zika.

Whom to contact. In case of any question or query concerning this study, please contact the principal investigator Dorice Lyimo (Msc.PMMEH) from MUHAS,P.O BOX 65001,Dar es salaam mobile number 0683 618696 or my supervisor Dr. Nathanil Sirili 0713 730179. If you have any question about your rights as participants you may contact Dr. Bruno Sunguya, Chairperson of Research and Publications Committee, MUHAS. P.O Box 65001, Dar es salaam-Tanzania, Tel +2552150302-6.

I……have read the contents of this form and understood it, my questions have been adequately answered, I agree to participate in this study.

Please sign your consent with full knowledge of the nature and purpose of the procedures.

A copy of this consent form will be given to you to keep.

Signature of Participant…….. Date…….

Researcher's Signature…….. Date……

Appendix II: Fomu ya ridhaa, Kiswahili

Namba ya Utambulisho…….

Utambulisho

Habari,naitwa Dorice Lyimo ,ni mwanafunzi wa shahada ya uzamili ya sayansi ya usimamizi,ufuatiliaji na tathimini ya miradi ya afya katika chuo kikuu cha afya na sayansi shirikishi Muhimbili.Utafiti huu unaangalia Mahusiona ya kuweza kuunganisha njia za kuzuia ugonjwa wa Dengue katika taasisi ys kupambana na ugonjwa wa malaria Tanzania.

Madhumuni ya Utafiti

Dhumuni la mahojiano haya katika utafiti huu ni kukusanya taarifa juu ya sababu zitakao weza kuunganisha njia za kuzuia ugonjwa wa Dengue katika taasisi ys kupambana na ugonjwa wa malaria Tanzania. Kwa upande wa shirika, mtu binafsi (wafanyazi wenyewe) na njia za kiufundi. Unaombwa kushiriki katika Utafiti huuu kwasababu tunaamini uzoefu wako na taarifa zako ni muhimu katika utafiti huu.

Mbinu za Utafiti

Kama sehemu ya utafiti huu tutafanya mahojiano ya kina, mhojaji atanakili kwa kinasa sauti majibu yako.Utahojiwa kwa taktibani dakika 35 hadi 45 kwenye eneo binafsi.

Taratibu za utafiti

Ushiriki wako kwenye utafiti huu ni wa hiari hii inamaanisha kuwa hutakiwi kushiriki ikiwa hutaki kufanya hivyo.waweza kukataa kujibu swali lolote ambalo hujisikii kulijibu na waweza kusitisha mahojiano wakati wowote. Taarifa utakazotoa ni siri na zitatumika kwa ajili ya utafiti pekee. Wanaohusika na utafiti huu ndiyo wanaweza kuzipata taarifa hizi. Jina lako halitaaandikwa kwenye fomu hii na halitahusishwa na taarifa,namba za siri zitatumika kutambulisha taarifa ulizotoa.

Faida: Hakuna faida za moja kwa moja utakazopata kwa ushiriki ila taarifa utakazotoa zitasaiadia kuwezesha / kushawishi upangaji wa njia bora zaidi za kuunganisha mikakati iliyojumuishwa ya ugonjwa wa malaria na dengue kupitia NMCP nchini Tanzania, kwani kudhibiti kuenea kwa dengue bado inahitaji kupambana na mbu moja kwa moja, ili kuboresha utumiaji wa rasilimali ya programu badala ya kuwa na programu mbili ambayo itakuwa na lengo la kupambana na mbu wa vector. Pia virusi vya mbu wa dengue pia huambukiza

chikungunya, homa ya manjano na maambukizo ya Zika. Kwa hivyo hitaji la kujumuisha dengue katika NMCP pia litasaidia kudhibiti magonjwa kama homa ya manjano, chikungunya na Zika. Hakuna hatari zozote zinazoweza kukupata kwa kushiriki kwenye utafiti huu. Waweza kumwuliza mhojaji maswali wakati wote wa utafiti.

Mawasiliano: Kama utahitaji ufafanuzi zaidi juu ya utafiti huu usisite kuwasiliana na mtafiti mkuu Dorice Lyimo,mwanafunzi wa shahada ya uzamili ya sayansi ya menejimenti, ufuatiliaji na tathimini ya miradi ya Afya(Msc.PMMEH) katika chuo kikuu cha afya na sayansi shirikishi Muhimbili S.L.P 65001,Dar es salaam au namba ya kiganjani 0683 618696 au msimamizi wangu Dr. Nathaniel Sirili 0713 730179. Kama una swali juu ya haki zako unaweza kuwasiliana na Dr. Bruno Sunguya ambaye ni mwenyekiti wa kamati ya utafiti na Machapisho,S.L.P 65001,chuo kikuu cha Afya na Sayansi shirikishi,Muhimbili S.L.P 65001 Dar es salaam au namba +2552150302-6.

Mimi…….Nimesoma/nimesikia na kuelewa madhumuniya utafiti huu na maswali yangu yamejibiwa ipasavyo.Hivyo nimeridhia kwa hiari yangu kushiriki.

Unaweza ukapaewa nakala ya fomu hii kama utapenda.

Saini ya Mshiriki……..tarehe……..

Saini ya Mtafiti……..…tarehe……..……..

Appendix III- English

Interview guide for Directorate of Preventive Services in the MoHCDGEC, members in NMCP management level and the members in National Malaria Steering Committee (NMSC)**.**

District……..…….

Title…….

Age……..

Sex……..

Education…….

1. I would like that now we discuss the possibility of integrating the control measures for malaria and dengue. In your own view how feasible is it to integrate the two? Probe on:

a. Knowledge on the importance of integration

b. Which measures can be integrated and which ones cannot and reasons for each.

2. I would like now to discuss on different factors that may influence the integration of dengue into malaria control. Probe on:

a. Individual level factors

i. Knowledge on dengue control measures

ii. Perception towards integration

iii. Attitude of the workers towards the integration of dengue control into NMCP

iv. Skills for integration (Additional skills needed)

v. Motivation towards integration

vi. Mindset towards changes

b. Organizational level factors

i. Human resource needs (numbers and skills, additional training needs etc)

ii. Structural needs (addition of units/departments or change of structures)

iii. Policy and guidelines (limitation policies/guidelines, need for policy changes, new guidelines etc)

iv. Finance (Additional funds for materials and supplies etc)

v. Stakeholders interests (policy makers, funders, Scientists, politicians etc)

vi. Additional workloads

c. Technical level factors

i. Needed systems for reporting

ii. Expertise on integration

iii. Additional technical infrastructure (ICT and information systems)

iv. Softwares for data collection and reporting

v. Integration of data tools

3. Thank you very much, now I would like to get your overall opinion things should be done inoder to integrating dengue into malaria control program.
4. Thank you very much, kindly tell me anything that I have not asked regarding this subject but you think that it was important to have been discussed and included.

Thank you very much for your time.

Muongozo wa mahojiano

Kiambatisho IV – Kiswahili.

Mwongozo wa mahojiano kwa Ofisi ya mkurugenzi wa Huduma za Kinga katika MoHCDGEC, watumishi katika ngazi ya usimamizi wa NMCP na wajumbe katika Kamati ya Usimamizi ya Malaria ya Taifa (NMSC).

Wilaya ……

Cheo……..

Umri……

Jinsia……

Kiwango cha Elimu…….

1. Ningependa kwa sasa tujadili uwezekano wa kuunganisha njia za udhibiti wa ugonjwa wa malaria na dengue. Kwa maoni yako mwenyewe je kunawezekana wa kuunganisha njia za udhibi wa magonjwa haya mawili? Dadisi:

a. Uelewa juu ya umuhimu wa ujumuishaji

b. Ni hatua gani zinaweza kuunganishwa na ambazo haziwezi na sababu za kila moja.

Ningependa sasa tujadili juu ya sababu tofauti ambazo zinaweza kushawishi uunganishaji wa dengue katika udhibiti wa ugonjwa wa malaria. Dadisi:

a. Sababu za kiwango cha mtu binafsi

i. Elimu juu ya hatua za kudhibiti dengue

ii. Mtizamo kuelekea ujumuishaji

iii. Mtazamo wa wafanyikazi kuelekea uunganishaji wa udhibiti wa dengue ndani ya NMCP

iv. Ujuzi wa uunganishaji (ujuzi zaidi unahitajika)

v. Uhamasishaji kwa watumishi juu uunganishaji

vi. Mawazo kuelekea mabadiliko

b. Sababu za kiwango cha shirika/uendeshaji wa NMCP.

i. Mahitaji ya rasilimali watu (idadi na ujuzi, mahitaji ya ziada ya mafunzo nk))

ii. Mahitaji ya miundo (nyongeza ya vitengo / idara au mabadiliko ya miundo)

iii. Sera na miongozo (sera / mwongozo , itahitajika mabadiliko ya sera, miongozo mpya nk)

iv. Fedha (Fedha za ziada za vifaa na vifaa nk)

v. Maswala ya Wadau (watunga sera, wafadhili, Wanasayansi, wanasiasa nk)

vi. Kuongezeka kwa kazi.

c. Sababu za kiwango cha ufundi

i. Mifumo inayohitajika kwa kuripoti

ii. Utaalam juu ya uunganishaji

iii. Miundombinu ya ziada ya kiufundi (ICT na mifumo ya habari)

iv. Mifumo ya ukusanyaji wa data na ripoti

v. Uunganishaji wa zana za kukusanyia data.

3. Asante sana, sasa ningependa kupata maoni yako ya jumla juu ya mambo yanayopaswa kufanywa ili kuingiza dengue katika mpango wa udhibiti wa ugonjwa wa malaria.

4. Asante sana, naomba uniambie kama kuna chochote ambacho sijauliza juu ya mada hii lakini unadhani ilikuwa muhimu kujadiliwa na kujumuishwa.

Asante sana kwa wakati wako.

Appendix V. Ethical clearance

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

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Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. HD/MUH/T.659/2018/02
IRB#: MUHAS-REC-06-2020-284

6th July 2020

Dorice D. Lyimo,
MSc. PMMEH,
School of Public Health and Social Sciences,
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED "INTERGRATION OF DENGUE CONTROL INTO MALARIA CONTROL PROGRAM IN TANZANIA."

Reference is made to the above heading.

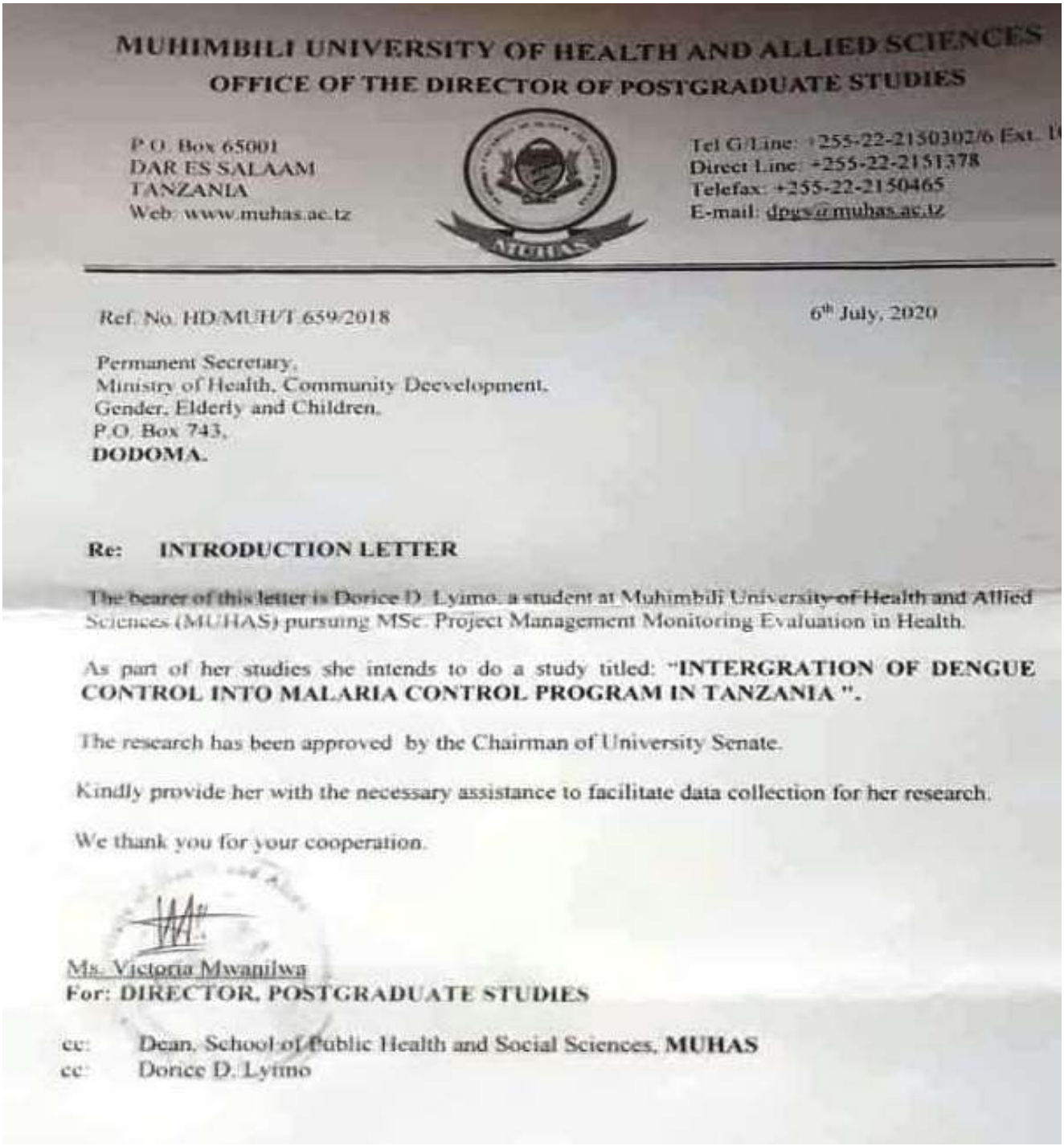
I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from **6th July, 2020 to 6th July, 2021.** In case you do not complete data analysis and dissertation report writing by **6th July, 2021,** you will have to apply for renewal of ethical clearance prior to the expiry date.

Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences, **MUHAS**

Appendix VI. Introduction letter



MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
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E-mail: dpgs@muhas.ac.tz

Ref. No. HD/MUH/T.659/2018

6th July, 2020

Permanent Secretary,
Ministry of Health, Community Deevelopment,
Gender, Elderly and Children,
P.O. Box 743,
DODOMA.

Re: INTRODUCTION LETTER

The bearer of this letter is Dorice D. Lyimo, a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Project Management Monitoring Evaluation in Health.

As part of her studies she intends to do a study titled: **"INTERGRATION OF DENGUE CONTROL INTO MALARIA CONTROL PROGRAM IN TANZANIA ".**

The research has been approved by the Chairman of University Senate.

Kindly provide her with the necessary assistance to facilitate data collection for her research.

We thank you for your cooperation.

Ms. Victoria Mwanilwa
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Dean, School of Public Health and Social Sciences, **MUHAS**
cc: Dorice D. Lyimo