EVALUATION OF THE IMPLEMENTATION OF THE REDESIGNED LOGISTICS SYSTEM: A CASE OF HEALTH FACILITIES AND MEDICAL STORES DEPARTMENT IN MWANZA REGION: A PROCESS EVALUATION

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By
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CERTIFICATION

The undersigned, certify that he has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences, a dissertation titled: "**Evaluation process of implementation of the redesigned logistics system: a case of health facilities and Medical Stores Department in Mwanza region: A process evaluation**" in fulfilment 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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(Co-supervisor)

Date: _____

DECLARATION AND COPYRIGHT

I, Salama Anyingisye Mwasambili, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university/institution for a similar or any other degree award.

Signature: _____ Date: _____

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DEDICATION

I dedicate this dissertation to my late father, Anyingisye Mwasambili and my mother, Asha Jussa Jaha

ABSTRACT

Background: The availability of medicines at service delivery points in many African countries including Tanzania remains uncertain. The global funding of diseases like Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome, malaria and Tuberculosis has resulted in increased volumes of commodities that have exacerbated the limitations of an already existing inadequate supply chain infrastructures. The redesigned logistics system was one of the initiatives employed to address the supply chain bottlenecks. The effective implementation of the redesign is crucial in ensuring the constant availability of health commodities at service delivery points. However, the fidelity in the implementation of the redesign logistics system in Tanzania conterxt was unclear.Therefore, this study aimed to assess the implementation of the Redesigned Logistics System by health facilities and Medical Stores Department in MTHwanza region.

Materials and Methods: This study was conducted at 47 health facilities in Magu district council including 1 hospital, 6 health centres and 40 dispensaries. Utilizing a sequential explanatory mixed method study design, the study involved both quantitative and qualitative cross section surveys. Quantitative data were collected on the electronic logistics Management information system, Epicor-10 and Facility Financial Accounting And Reporting System databases using a checklist. Qualitative data were gathered through interview with 15 key informants consisting of 7 health facilities personnel and 8 Medical Stores Department personnel. The quantitative data were analyzed by SPSS statistical package while NVivo version 14 was used for qualitative data analysis.

Findings: Over six cycles, the redesigned Integrated logistics system increased the timely submission of bimonthly reports from 57.4% to 100%. However, Medical Stores Department struggled with timely delivery, with only 40.8% of supplies delivered on time and 59.2% falling out of timeframe. Magu district utilised only 11.1% of the total health expenditures for purchasing heath commodities below the 50% indicated in the national guidelines. The council hospital had a slightly higher proportion of total expenditure for health commodities as a (23.7%),while health centres (12.1%) and dispensaries (2.5%). The

health sector basket fund was the highest source (43.5%) followed by user fees (28.9%) and National Health Insurance Fund (27.4%).

Conclusion

The implementation of redesigned logistic system has significantly improved the timely submission of health facilities bimonthly reports to Medical Stores Department. However, Medical Stores Department struggled with timely delivery of health commodities to health facilities due to frequent stock shortages, disrupted distribution cycles, infrastructure and human resource challenges. Despite, increased health facility's fund visibility, there was lower uptake of complementary funds for health commodities procurement that was below the guideline. The funds were lowest allocated for dispensaries with health sector basket funding being the main source fund. Staff motivation, internal and external pressure, and regular communication with stakeholders were among the factors that contributed to successful implementation. These findings underscores the need for policy intervention to address both systematic and operational challenges within the health supply chain, optimize resource allocation, and strengthen infrastructure and human resource capacities within the health system.

Recommendations

Health facilities should strengthen communication with Medical Stores Department in order to streamline logistical operations and ensure timely distribution of health commodities and seek mentorship support from Regional Health Management Team/Council Health Management Team during supervisory visits to increase reporting accuracy and reduce emergence orders. On the other hand, Medical Stores Department should address human resource challenges especially for areas with high work load, seek support from authorities to improve road infrastructures, improve monitoring and evaluation framework that will help in improving operational efficiencies and prepare a flexible budget for unforeseen circumstances.

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LIST OF ABBREVIATIONS

CHMT	Council Health Management Team
CMS	Central Medical Stores
e-LMIS	Electronic Logistics Management Information System
HCPs	Healthcare Providers
HFs	Health Facilities
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HSCR	Holistic Supply Chain Review
ILS	Integrated Logistics System
KPIs	Key Performance Indicators
MCOs	Medical Stores Department Community Outlets
MoH	Ministry of Health
MSD	Medical Stores Department
OECD	The Organization for Economic Cooperation and Development
OOP	Out of Pocket
PO-RALG	President's Office, Regional Administration and Local Government
R&R	Report and Request
RHMT	Regional Health Management Team
RLS	Redesigned Logistics System
RMNCH	Reproductive, Maternal, Neonatal and Child Health
SDPs	Service Delivery Points
SMS	Short Messages Services
TAT	Turnaroundtime
TB	Tuberculosis

DEFINITIONS OF KEY TERMS

Supply chain management includes the planning and management of all activities involved in sourcing, purchase and logistics management.

Logistics management involves planning, implementing, and controlling the efficient and effective forward and reverses flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.

Redesigned Logistics System involves making changes to the existing system by identifying and addressing bottlenecks as well as implementing strategies to improve efficiency and effectiveness. The Ministry of Health of Tanzania changed the distribution model from quarterly to bi-monthly. The reports are submitted via the e-LMIS, which is converted to an order in Epicor-10 and MSD processes the order within 20 or 21 days. MSD delivers the health commodities every two months of each reporting period, making it six cycles annually.

Medical Stores Department is a semi-autonomous body established under the Parliament Act No. 13 in 1993 that is responsible for the procurement, storage, and distribution of medicines and medical supplies throughout the nation.

Health Commodities refers to commodities that directly related to maintain and improve health. They include medicines, medical supplies, equipment's, diagnostics and other consumables that flow through the logistics system

Other commodities refers to goods and services that are not directly related I maintain and improving health but are necessary for operations such as office supplies or transportation equipment's

Service Delivery Points refers to any health facilities including hospitals, health centers and dispensaries where users receive medical supplies related to health services.

Users, clients, patients, customers refers to the people who receive or use supplies.

Turnaround time refers to the time between when ordering and the receipt/delivery of health commodities.

Complementary funds refers to funding mechanisms that have been introduced by the government where the health facilities are responsible for collecting and managing funds for health commodities at facility level such as health insurances, improved community health funding, donor fees, user fees, councils own source, result based funding and other schemes

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

A well-functioning supply chain system guarantees the availability of affordable and high-quality health commodities at service delivery points (SDPs)(1). The availability of medicines at SDPs in many African countries including Tanzania is reported to be below 60% across WHO regions (2–4). Despite significant investments prioritized in global health initiative targeting specific diseases like HIV/AIDS, malaria, and TB there has been little emphasis on strengthening the healthcare supply chain (5). As a result, the force from increased volumes of commodities have exacerbated the limitations of an already existing inadequate supply chain infrastructure (5,6).

Several efforts have addressed these bottlenecks in the healthcare commodity supply chain such as changes in procurement strategies, financing mechanisms, workforce training, management, and systemic redesign(7,8). The system redesign stands out as a critical solution to address operational inefficiencies, data quality issues, information gaps among stakeholders, and unclear accountability, all of which hamper the efficient distribution of essential medicines at SDPs(5,6,8). System redesign involves making changes to the existing system by identifying and addressing operations bottlenecks, as well as implementing strategies to improve efficiency and effectiveness by decreasing levels of distribution, relocations of storage points and altering the transport channels (8,9).

In developed countries, a well-established system is utilized to distribute medicines and medical supplies to end users through hospitals and retail pharmacies. Healthcare providers (HCPs) send list of required medicines to pharmacies. The pharmacies analyses the requirements and place orders to a prequalified list of distributors and wholesalers. Then, commodities are delivered in bulk to the pharmacies by the distributors and wholesalers. The frequency of distribution of medicines varies by country with some occurring twice a day like in Europe and multiple times a week in the US (6,10).

The supply chain of health commodities in most low- or middle-income countries such as those in Sub-Saharan Africa (SSA) is faced with several challenges. Challenges like uncertainties in financing, long resupply intervals, inadequate supply chain planning, data and infrastructures (6,7,11). The distribution models are centralized through government run organizations known as Central Medical Store (CMS). The commodities are purchased by the CMS and the distributed to stores at the regional or district level and finally dispersed further to health facilities (HFs) (5,6,11). Sometimes due transportation ineffiencies the HFs are forced to physically pick their supplies at the district level as reported in Nigeria (6,11).

Most of these countries use a multi-tiered system to distribute health commodities from the CMS to HFs(5). The number of tiers differ by country depending on factors such as administrative structures, geographic location, and the number of HFs(5). In Zambia, a three-tier model is used to distribute essential health commodities from the CMS to the zonal/district warehouse and finally to HFs(5). Also, in Kenya and Ndola district in Zambia, a two-tier model is used to distribute commodities directly from the CMS to HFs (5,11). The distribution frequency of CMS to downstream tiers varies across countries, with some countries like Zambia distributing monthly and others like Kenya, Gambia and Mozambique every three months (5).

In 1993, the Parliament Act No. 13 in 1993 of Tanzania established the Medical stores department (MSD) (12). A semi-autonomous body responsible for procurement, storage, and distribution of medicines and medical supplies national-wide. MSD utilizes three tiered model to distribute health commodities to public HFs (7). It procures commodities, stores them at the central warehouse before they are distributed to zonal warehouses and later direct deliver to HFs using the government own vehicles. It operates through ten zones and seven MSD community outlets (MCOs) located at hospitals with its headquarters in Dar-es-Salaam (13).

Previously the health commodities were ordered from more than 30 vertical programs (VP), each with its own procedures and requirement(14). In 2005, the MOH of Tanzania in collaboration with various partners strengthened the supply chain by replacing the VP with Integrated Logistics System [ILS] for management of all health commodities, increasing

the overall budget for the health commodities and introducing electronic technologies such as electronic logistics management information system (eLMIS) and Epicor-9 an Enterprise Resource Planning (ER) software used to manage business processes such as supply chain management from quantification, procurement, storage, distribution to SDPs. The system aimed at improved communication operations between HFs and MSD(4,14). The public health supply chain has improved with studies reporting that ILS reduced the stock out rates and increased availability tracer commodities at MSD to 79.9% at the time of study (2,15).

Despite significant achievement, the availability of health commodities at SDPs in many SSA, including Tanzania, remains uncertain, particularly affecting lower-level HFs (1,2). The key contributing factors include inadequate infrastructures, with poor road networks unable to handle increased volumes of commodities, resulting in delivery delays (16). The centralized distribution model, involving a multi-tiered system, exacerbates these challenges by creating bottlenecks in transportation and resupply (5). Also, poor data quality and limited visibility within the supply chain contribute to frequent stock-outs(7). Human resource constraints, such as insufficient training and staffing, further hinder effective logistics operations (7). Additionally, fragmentation of procurement and management resulting to poor quantification, selection and inventory management (1,6,17). These makes timely and informed decision-making difficult, resulting uncertain availability at SDPs and frequent stock-outs (7,18).

In 2017, the government of Tanzania conducted a Holistic Supply Chain Review (HSCR) to address these obstacles. The redesign of logistics system was among the recommendation of HSCR (4,18). The roll out of redesigned Logistics System Standard Operating Procedure Manual began in 2018 and was piloted in 2019 in Mwanza Zone. Currently, is implemented by all HFs in the country. The manual is designed for HFs staff, Council Health Management Team (CHMT) and Regional Health Management Team (RHMT) members, training institutes, Ministry of Health Pharmaceutical Services Unit (MOH-PSU), Programs, MSD, and President's Office, Regional Administration and Local Government (PORALG). It provides procedures for managing health commodities, guides all HFs and other supply chain implementers to collaborate in the implementation of redesign, improve capacity, and

engage key stakeholders involved in planning and advocating for health commodities management (4).

The redesign system functions as a pull system with district HFs overseeing the inventory reporting and order processing using demand driven data and electronic system (4). The ordering and delivery cycle changes from quarterly to a bimonthly schedule .The dispensaries and health centers submit monthly reports by fifth day of each month to district HFs and by tenth day of each month all reports from hospitals are submitted to MSD. On the other, MSD maintains facility order fill rates above 90%, ensuring on-time deliveries within twenty days turnaround time, reducing medicine expiration rates to below 1% and ensuring accurate inventory deliveries (4,7).

The redesign ILS faces several limitations that undermines its effectiveness in ensuring the constant availability of health commodities at SDPs. Challenges such as delayed deliveries and inventory management continue to persist resulting in frequent stockouts at SDPs(7). Disparities in funding across different types of HFs further exacerbate access inequalities, particularly affecting rural and underserved areas (19). Also, Insufficient staff training results in inefficiencies, as staff lack the skills needed for effective inventory management, data reporting, and adherence to logistics guidelines(7). To overcome these issues, a comprehensive approach is necessary, focusing on strengthening the entire supply chain. Therefore, comprehensive process evaluation of implementation of redesign ILS is necessary to identify and address areas of improvement in order to enhance efficient logistics system that will ensure constant availability of health commodities at all levels of supply chain.

1.2 The Problem Statement

Effective implementation of the redesigned supply chain is expected to increase data visibility, delivery frequency of health commodities, reduce storage challenges and increase fund uptake by HFs. A study conducted in Zambia reported, the redesign system has enhanced accountability, improved decision-making and reduced stockouts of medicines, with frequency of stockouts for first line pediatric malaria medicines reduced from 47.9% to 13.3% and the number of days of stockouts in a quarter reduced from 27 days to 5 days (5,6).

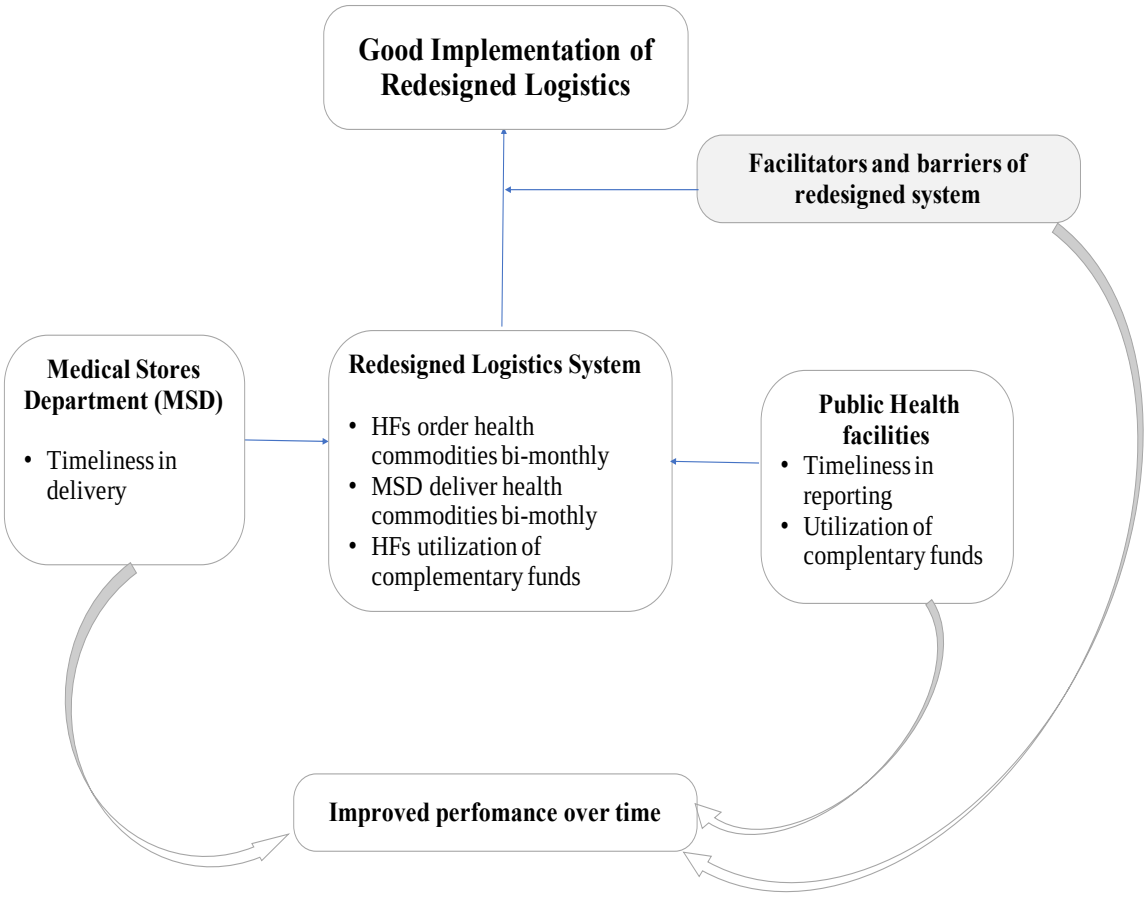
The MSD of Tanzania adopted redesigned supply chain model in 2018, which was piloted in 2019 and now is used by all public HFs. It intends to alleviate the problem of uneven availability of health commodities at SDPs and reduce stock out rates. Studies that assessed the implementation of redesign in Mwanza region reported; improved reporting rates (98%) and increased funds visibility for HFs but the stock out rate of Reproductive, Maternal, Neonatal and Child Health(RMNCH) products remained high at 19% below <5% target (18).

Moreover, assessment conducted in Tabora region reported low availability of examination gloves (55.6%), Sulphadoxine Pyrimethamine (SP) tablets (60.6%) and Paracetamol 500mg tablets (51.5%)(18). Delays in submission of HFs monthly reports and MSD adherence to bimonthly distribution schedule were also mentioned as challenges to the redesign implementation (4,7,17).

Studies have looked on the outcome assessment of redesign on availability and stock out rates of medicine and medical supplies at SDPs. However, the fidelity in implementing the redesign system has not yet been studied. To ascertain the importance of the redesign and its achievement of the intended goals, an evaluation of implementation is imperative. This research aims to assess the implementation of redesign logistics system by focusing on health facilities and Medical Stores Department in Mwanza region to get an in-depth understanding of RLS implementation, provide evidence-based recommendations and improve effectiveness and efficiency at all levels of supply chain.

1.3 The Conceptual Framework

This framework assumes the fidelity in the implementation of the redesigned logistics system which was intended to increase health commodities availability. In implementing the redesigned logistics system, the health facilities play a crucial role in submission of monthly reports and ordering health commodities bimonthly to MSD, whereby the filling of actual consumption was modified from calculated consumption to actual consumption from the daily dispensing register. On the other hand, MSD is responsible for the distribution of health commodities to HFs every two months.



Description of terms

1. Redesigned Logistics System: This refers to the updated system where HFs order health commodities bimonthly, MSD delivers these commodities bimonthly, and HFs utilize complementary funds for ordering. This system is designed to streamline the ordering and delivery process to ensure a steady supply of health commodities.
2. Medical Stores Department (MSD): The MSD plays an important role in the redesigned system by ensuring the timeliness of deliveries of health commodities to HFs. It serves as the central point for procuring and distributing health commodities to the health facilities.
3. Public Health Facilities: These are the health facilities that report on their needs to MSD bimonthly and received healcommodties from MSD in bimonthly basis. also utilizes complementary funds for purchasing health commodities. Their effectiveness in

reporting and proper fund utilization directly impacts the availability of commodities at service delivery points.

4. Facilitators and Barriers of Redesigned Logistics System Implementation: This represents the factors that either support or hinder the good implementation of the redesigned logistics system. It includes timeliness in delivery and reporting, the effective use of funds, and potential challenges that affect the overall system functionality.
5. Good Implementation of Redesigned Logistics System for Health Commodities: This is the desired outcome of the logistics system redesign, aiming for consistent availability of health commodities. Successful implementation ensures that health facilities have the necessary supplies to provide uninterrupted services to patients.
6. Improved performance over time: This refers to the feedback mechanism that involves continuous communication and adjustments between the health facilities, MSD. Positive feedback like timely deliveries and accurate reporting supports the good implementation of the system, while negative feedback such as delays, reporting gaps highlights areas for improvement, leading to adjustments in practices.

1.4 Rationale of the study

The findings of this study will offer valuable evidence to the Medical Stores Department, health facilities and other stakeholders involved in the Redesigned Logistics System, enabling them to make informed decisions to ensure a consistent supply of health commodities and reduce frequent stock-outs at all levels of supply chain. Additionally, the study will support long-term improvements in the logistics system by identifying key areas for policy intervention, optimizing resource allocation, and enhancing the overall infrastructure of supply chain, thereby benefiting all levels of the logistics system.

1.5 Broad research question

How is the Redesigned Logistics System implemented by HFs and MSD in Mwanza region?

1.5.1 Specific research questions

1. What is the trend in public HFs submission of bimonthly reports to MSD as per redesign system for the financial year 2022/2023?
2. To what extent do MSD adhere to the proposed distribution schedule in the redesign for the financial year 2022/2023?
3. To what extent do HFs uptake the complementary funds for purchasing health commodities for the financial year 2022/2023?
4. What facilitators and barriers do personnel from the MSD and public HFs perceive as influencing the successful implementation of the redesigned system?

1.6 Broad objective

To assess the implementation process of the Redesigned Logistics System by HFs and MSD in Mwanza region.

1.6.1 Specific objectives

1. To determine the trend in public HFs submission of bimonthly reports to MSD as per redesign system for the financial year 2022/2023.
2. To assess the extent to which MSD adhere to the proposed distribution schedule in the redesign for the financial year 2022/2023.
3. To assess the uptake of complementary funds in purchasing health commodities by HFs for the financial year 2022/2023.
4. To identify the facilitators and barriers of successful implementation of the redesign system as perceived by personnel from MSD and public HFs.

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter reviews the implementation of the Redesigned Logistics system in reporting compliance, adherence to the distribution schedule of health commodities and the uptake of complementary funds for purchasing health commodities depicting the existing situation globally, in Africa and Tanzania.

2.1 Reporting compliance

The digital logistics information systems has shown significant benefits in various countries. For instance, in Pakistan, studies reported implementing the online contraceptive logistics Management information system (cLMIS) has significantly improved the visibility of data across the entire contraceptives supply chain system. The use of cLMIS has enabled the relevant government officials to make timely decision, reduced paper-based reporting, generate stockout emails and short messages Service (SMS) alerts. This increased reporting and use of data from 71% to 99%, which in turn improved stock availability at SDPs from 86% to 91% at the time of study(20).

In South Africa studies shows that the implementation of the Stock Visibility Solution (SVS) digital reporting system has enhanced vaccine distribution. The system generates real-time weekly stock status reports, allowing managers to identify stock shortages and take appropriate action. However, obstacles such as a lack of response from supervisors and increased workload as a result of staff shortages hinder its effective implementation (21).

The Ministry of health of Tanzania in collaboration with other stakeholders have reconfigured the e-LMIS to improve visibility of data and manage the inventories. The system now includes monthly stock on hand reporting for all HFs and inventory reporting of minimum two months and maximum of four months. Studies show that 98% of all HFs submit report and request (R&R) timely through the e-LMIS facilitating data visibility to other stakeholders including MSD (18).

MSD on the other hand, use mobile application that collect the order fill rate data and captures the proof of delivery that are visible in the eLMIS. This has increased data visibility by generating timely delivery and order fill rate reports which are incorporated as MSD key performance indicators (KPIs) in the redesign (7,18).

In the assessment study conducted in Tabora region on system redesign implementation revealed that reports from HFs to MSD were not submitted on time. Only 43% of monthly report (R) and 37% R&R were submitted on time with majority of R being submitted during submission of R&R (18).

2.2 Adherence to the distribution schedule of health commodities

In most developed countries particularly the OECD countries like US, the private wholesalers and distributors are involved in the distribution of health commodities to the hospital and retail pharmacies. The distribution of health commodities from the doctor's office or licensed pharmacies or dispensary. To ensure constant availability of health commodities at SDPs, the drugs are distributed to the hospital and retail pharmacies frequently, with Europe distribution occurring twice per day and several times a week in the US(6,10).

Distribution of health commodities is observed as the key challenge in most developing countries in ensuring product availability at SDPs. A study conducted in Madagascar discovered challenges in supply of immunizations, such as geographical distance, non-functionality of cold chain equipment's, and shortage of healthcare providers. According to the study, 26-33% of the population lived more than five kilometers from HFs, and only 10-57% had two qualified HCPs. To address these issues, the RED approach was implemented, with a focus on reaching the entire target population, connecting services to communities, providing support, and managing resources using local data(10,22).

In study conducted Tabora region in Tanzania reported that MSD faces financial challenges in complying bimonthly delivery of health commodities. Also, delayed submission of R by HFs, large coverage area, short turnaround time of twenty days and frequent emergence

orders placed by HFs that interferes with the normal ordering cycles are among the challenges(18).

2.3 Uptake of complementary funds for health commodities procurement

A study conducted in Indonesia in 2019 reported that various complementary funds are utilized in healthcare financing with the out of pocket (OOP) being the leading source (32.1%), followed by other government sources such as Social Health Insurance (29.1%) and other public schemes (23.1%) and the least source being the Private Health Insurance (3.5%)(23).

Moreover, a study conducted in Pakistan reported that improved data visibility play an important role in making informed decision about allocation and uptake of available funds. This helps to sustain the procurement processes and ensuring the constant availability of commodities at all levels of supply chain (20). Also, studies reported that in most Low and Middle Income Countries (LMICs), health systems depends on various complementary funding sources, mostly commonly being taxation and out of pocket (OOP) and others such as Social Health Insurances, private Health insurance, Community Based Health insurances and donations (23).

In Tanzania various complementary sources of funding are utilized at HFs levels including the Improved Community health Fund (ICHF), Health insurance such as the National health Insurance scheme (NHIF), user fees, Donor funds, councils own funds, result-based financing (RBF) and other insurances schemes such as strategies (4).

In implementing the redesign, the MOH engaged stakeholders in developing the health commodity revolving fund (HCRF) guideline that aims to sustain health commodities funding. The HCRF guideline allows HFs to manage and uptake the available funds collected from health services provided by HFs. The interoperability of e-LMIS and Epicor allows visibility of funds at HFs and MSD. This enables HFs to utilize the funds in procurement of commodities thus ensuring adequate stocking and timely re-stocking of the health commodities (18)

2.4 Facilitators and barriers of redesign logistics system implementation

Implementation of redesigned of logistics system for health commodities supply chain system is crucial for streamlining the activities and improving performance and efficiency. Involving stakeholders in identifying the constraints, redesigning the activities and piloting projects to identifies the bottlenecks of the supply chain has reduced stock out rates, increased delivery coverage and increased availability of health commodities at HFs.

In a study assessing the performance of immunization supply chain in Benin and Mozambique reported that utilizing an informed push system redesign, introducing transport loops, consolidating storage points and capacity building for human resources has improved the performance of the supply chain. In Benin, the distribution criteria tool improved from 40% to 100% at district level and stock out rates were reduced from 79% at baseline to less than 1% at end line at HFs level. Also there was noted increase in coverage rates of DTP3 from 68.9% to 92.8% reported in Mozambique(9,24).

In a study conducted in Zimbabwe assessing the cost of supply chain for health commodities utilizing the Delivery Team Topping Up (DTTU) where health commodities are delivered to HFs by trucks on bimonthly basis. Reported that the cost of DTTU, an informed push approach appears to be less costly than a pull system for a smaller number of commodities that are intended for primary HFs. The DTTU delivery system can add commodities for a similar average cost of delivery with additional funding for capital and operating costs.

In Tanzania considerable efforts have been made in implementing the redesigned logistics system although challenges like inadequate knowledge on redesign, limited availability and use of necessary tools for implementation of redesign and inadequate staff training were observed as barriers of implementation of the redesign as seen in Tabora Region (18).

Despite the different literatures reviewed in this section, currently there is limitedness in published report concerning implementation of redesigned logistics system since studies focused on assessing the outcome of the redesign mainly the availability of health commodities and reduced out of stock at SDPs. This research aims to deep dive in public

HFs and MSD Mwanza region to get an understanding on how the redesign is put in action in achieving the intended results.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

A cross section sequential explanatory mixed method study design involving quantitative and followed by qualitative approaches was employed to assess process of the implementation of the redesigned logistics system for health commodities among HFs and MSD in Mwanza region. In this process evaluation, the quantitative phase analyzed the key indicators; reporting timeliness, timeliness in delivery and utilization of complementary funds by health facilities in purchasing health commodities. The qualitative phase explained the trends observed in the quantitative data providing deeper understanding of the quantitative results into the underlying reasons behinds those findings.

3.2 Study area

The study was conducted in Mwanza region which is the second region with high population. Approximately it covers an area of about 25,233 kilometres square. The region is bordered to the north through Lake Victoria by Kagera region and Mara region, to the south by Shinyanga region, to the west by Geita region and to the East by Simiyu region. Administratively, Mwanza Region is divided into is divided into seven districts. According to a national population census of 2022, the region has a total population of **3,699,872** being the second populous region from Dar es Salaam(25)**.**

Mwanza region was selected because it was one of the regions in Tanzania where the redesign was piloted. Mwanza region has large coverage with urban and rural health facilities making it representative of logistical challenges faced in similar context. Studying Mwanza offers a practical understanding of how these challenges impact supply chain performance in real-world conditions. The findings not only address local issues but also have broader implications for improving health supply chain performance in other regions with comparable challenges. Therefore, it served as a potential area to provide insights into the best practices of the implementation of the redesigned logistics system and offer evidence-based decision on the areas of improvement in supply chain of health

commodities, ultimately supporting more efficient health commodity distribution systems across Tanzania

However , due to time and resource limitations, the study focused specifically on randomly selected Magu district council within Mwanza region. It encompassed a total of 47 public HFs comprising 1 hospital, 6 health centers, and 40 dispensaries were included in the study **(list appended)**

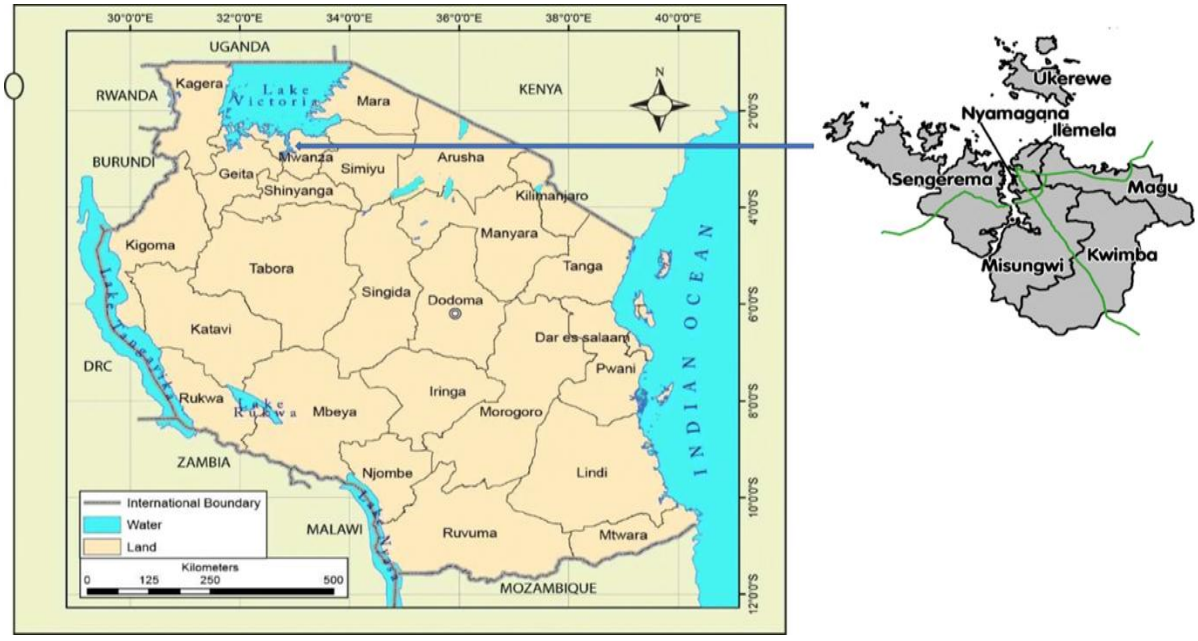


Figure 1: Map of districts in Mwanza region, Tanzania

3.3 Study population

3.3.1 Quantitative

The study population was 47 public HFs in Magu district council within Mwanza region included 1 hospital, 6 health centers and 40 dispensaries.

3.3.2 Qualitative

The study population involved one accounting officer, three warehouse officers, four sales officers from MSD zone office and three Facility in Charges, One Pharm.Tech/Lab Personnel and two Store Personnel from the selected HFs in Mwanza region.

3.4 Sample size calculation

3.4.1 Quantitative sample size

Mwanza region has 7 districts with a total number of 336 HFs including 10 Hospitals, 44 health centres and 282 dispensaries. The average number of HFs per district is 48, therefore the optimal sample size for this study was 48 HFs.

Proportionality calculation for each stratum will be calculated as follows;

- Proportional of hospitals. = No. of hospitals/Total No. of HFs
  = 10/336= 0.0298 or 3%
- Proportional of health centres = No. of health centres/Total No. of HFs
  = 44/336 = 0.1309 or 13%
- Proportional of dispensaries = No. of dispensaries/Total No. of HFs
  = 282/336 = 0.8393 or 84%

Then, the number of facilities from each stratum will be calculated as follows,

No. of facility type= Proportion No. for each stratum x desired sample size

- No. of Hospitals= 0.0298 x 48= 1.43~1
- No. of Health centres=0.1309 x 48= 6.28~6
- No. of Dispensaries= 0.8393 x 48= 40.29~40

Total calculated No. of HFs = 1+6+40= 47

Note: Since the calculated sample size (47 HFs) was less one HF compared to the desired sample size (48 HFs), one HFs in the dispensaries stratum was added to get a total number of 48 HFs.

Therefore, the quantitative estimated sample size was 48 HFs including 1 Hospital, 6 Health centres and 41 dispensaries.

3.4.2 Qualitative sample size

Purposive sampling techniques was used to select staffs dealing with redesign ILS from 5 HFs where 2 facilities achieved the target of submission of the bimonthly reports and 3 facilities failed to achieve the target the six times submission of the bimonthly reports. A

total of 7 HFs staff including 3 facility in charges, 2 Pharm/Lab tech and 2 store personnel were interviewed. Simultaneously, a total of 8 MSD staff including 3 warehouse Officers, 1 accounting officer and 4 sales officers were interviewed. This was done to gain deep understanding of experiences, perceptions and opinions regarding the facilitators and barriers of the successful implementation of the redesign logistics system. The sample size was 15 staffs: 7 participants from Public Health facilities and 8 participants from MSD as detailed in the table 1 below

Table 1: Study participants for the qualitative approach

Organization	Position	Number of staff	Total No. of participants
MSD	Accounting officer	1	8
	Warehouse officers	3	
	Sales officers	4	
Public HFs	Facility in Charge	3	7
	Pharm./Lab tech	2	
	Store Personnel	2	

3.5 Inclusion and Exclusion Criteria

3.5.1 Inclusion criteria

Public HFs from Magu district council that included in the study were:

1. Public HFs that have been operational for at least three years before and after the redesign logistics system
2. Public HFs located within the Mwanza region
3. Public HFs actively using the redesigned logistics system for the year 2022/2023
4. Facilities with complete and accurate data on logistics performance before and after the redesigned system

3.5.2 Exclusion Criteria

One dispensary was excluded from the study because it did not implement the redesign for the whole financial year 2022/2023.

3.5.3 Quantitative sampling

Stratified random sampling technique was used to select HFs that were included in the study. This involved the use of simple random sampling technique where Magu district council was selected among the districts in Mwanza region. The HFs within Magu district were divided into three strata basing on facility type into hospitals, health centers and dispensaries. Proportionality to size was used to select the number of facilities from each stratum where 3% was for hospitals, 13% for health centers and 84% for dispensaries stratum.

3.5.4 Qualitative sampling

Purposive sampling method was used to select one accounting Officer, three Warehouse officers, four sales officers from MSD zone office and 3 facility in charges, two Pharm.Tech/Lab Personnel and two Store Personnel from two highly performing HFs and three least performing HFs within the Magu district in Mwanza region.

3.6 Variables

3.6.1 Dependent variables

The dependent variable was the good implementation of redesign logistics system among health facilities in Magu district council and MSD in Mwanza region. It was evaluated by assessing the fidelity of MSD and HFs in implementing the processes of redesigned system. This was operationalized by using key indicators that included: HFs timely submission of reports by the 10th of each reporting month, timely delivery of commodities by MSD within 20 to 21 days TAT, and the trends in utilization complementary funds for health commodity procurement by HFs

3.6.2 Independent variables

1. Submission of Bimonthly Reports was operationalized through the e-LMIS system, with the percentage of reports submitted on time to MSD by the 10th day of each reporting month being a cut-off point.
2. Compliance with Bimonthly Distribution was assessed by MSD's adherence to the 20- or 21-day turnaround time for deliveries, with data collected on the timeliness and number of deliveries.

3. Uptake of Complementary Funds was measured by the percentage of funds from sources like the Improved Community Health Fund and the National Health Insurance Fund used by HFs for purchasing additional health commodities.

3.7 Data collection method and procedure

3.7.1 Quantitative

The data were collected from the electronic logistic management system (e-LMIS) database, Epicor -10 database and FFARS. The collected data was prepared and entered Microsoft excel software and then analyzed using SPSS statistical package.

Objective one: To determine the trend in public health facilities submission of bimonthly reports to MSD as per redesign system for the financial year 2022/2023

Quantitative data from eLMIS database was collected using a checklist. The redesigned ILS in eLMIS database has categorized HFs into two groups, A and B. These facilities are differentiated by reporting and distribution cycles. The reporting and distribution cycles are alternate between them. Group A facilities submit reports every two months on July-Aug 2022, Sep-Oct 2022, Nov-Dec 2022, Jan-Feb 2023, Mar-Apr 2023, May-Jun 2023 while Group B reports on Jun-July 2022, Aug-Sept 2022, Oct-Nov 2022, Dec-Jan 2023, Feb-Mar 2023 Apr-May 2023).

In the redesigned ILS, Magu district council fall under group B facilities. Therefore, data on timeliness in reporting for Magu district council facilities were extracted from the eLMIS database. The data contained included six bimonthly reporting points, between June 2022 to May 2023 (Jun-July 2022, Aug-Sept 2022, Oct-Nov 2022, Dec-Jan 2023, Feb-Mar 2023 Apr-May 2023). On time reports were considered as those received by MSD by 10^{th} day each reporting period, Not on time that were received after 10^{th} day of reporting period and none reporting as those not submitted the reports on the respective reporting period.

Objective two : To assess the extent to which MSD adhere to the proposed distribution schedule in the redesign for the financial year 2022/2023

Quantitative data on distribution of health commodities were collected using a prior developed checklist. The data were extracted from the Epicor-10 database from MSD. In the redesigned ILS, MSD receives the bimonthly reports by 10th day of each reporting period then reports get converted to orders in the Epicor -10 system. From the 11th day to 30th or 31st day, MSD is required to complete order processing and distribute to all HFs.

A total number of orders received by MSD was compared with the total number of orders that MSD was able delivery within 20 days turnaround time for each reporting period. The orders that were delivered within 20 days of the respective month were considered on time and those that were delivered more than 20 days were considered not on time and those delivered within 20 days but not on the respective months were also considered not on time.

Objective three: To assess the uptake trend of complementary funds in purchasing health commodities by HFs for the financial year 2022/2023.

Quantitative the data was collected using a prior developed checklist. Data were extracted from quarterly income and expenditure report generated from Facility Financial and Reporting system (FFARs) to assess the trend of complementary fund utilization in purchasing health commodities by HFs.

3.7.2 Qualitative

Objective four: To identify the facilitators and barriers of successful implementation of redesigned system as perceived by personnel from MSD and public HFs

The data was collected from the purposively selected HFs staffs dealing with logistics operation from MSD Mwanza zone Office and 5 HFs including two highly and three fairly performing HFs. Separate interview guides were used to collect data using in depth Interviews from 8 MSD Mwanza Zone Staffs and 7 HFs staffs to collect information on facilitators and barriers of successful implementation of the redesign logistics system basing on their experiences, perception and opinions.

3.8 Data collection personnel

The principal investigator collected all the data.

3.9 Data storage

Data gathered was stored both manually and electronically in personal computer for ease retrieval when needed. All gathered data was secured using the physical lock and digital password allowing access to the researcher only.

3.10 Research instruments-validity and reliability

The interview guides were pre-tested before the commencing of data collection at MSD staffs and HFs staff from Dar es Salaam Zone. To ensure the findings are credible, transferable, confirmable and dependable a wide range of informants such as warehouse Officers, accounting officers, sales officers, hospital in charges, pharm. tech/Lab in charges and store personnel were used so that the information given can be verified against others. Also, probing was done to elicit detailed information during the in-depth interview and through a detailed description of the participants and the research process.

3.11 Data analysis

3.11.1 Quantitative data analysis

Objective 1:

The trend of HFs reporting compliance as per the redesign system for the period of financial year 2022/2023 was analyzed using SPSS statistical package. This involved categorizing the facilities by facility types into hospital, health centers and dispensaries. Then the total number of facilities that submitted on time, not on time and none reporting were determined for each facility type basing reporting period or cycle. The trend on bimonthly report submission were presented using table and graph showing the percentage of facilities that reported on time, not on time and non-reporting for the financial year 2022/2023.

Objective 2:

The extent of MSD adherence to the proposed distribution schedule as per redesigned ILS for the period of financial year 2022/2023 was analyzed using SPSS statistical package. This involved categorizing the facilities by facility types into hospital, health centers and dispensaries. The level of adherence to the bimonthly distribution of health commodities to the HFs, was assessed based on checking timeliness in deliveries basing on the turnaround

time of 20 days proposed in the redesigned ILS SOP manual 2018 the order received by MSD.

The total number of orders that were received by MSD from 47 HFs within Magu DC for the respective financial year, were determined. The data was analyzed by determining the total number of orders that were delivered on time (within 20 days) and those that were not delivered on time (after 20 days) and none reporting for those not reported at all. The results were presented using a table in terms of percentage by facility type.

From the data obtained above, the redesigned ILS regular orders were determined by were distinguishing them from other orders such emergencies, back orders and allocations using the eLMIS order number and assessed separately. Then ILS regular orders that were delivered within 20 days of each reporting and distribution cycle were then determined and reported yes on time, after 20 days were reported not on time and not reported at all in the respective month were labeled none reporting. The results were presented in table and graph basing on facility type using percentages.

Objective 3:

The trend of uptake of complementary funds by HFs for purchasing health commodities for the financial year 2022/2023 was assessed using SPSS statistical package version 20. After determining the overall expense for HFs within the Magu district council, the amount allocated for health procurement was ascertained, calculated as a percentage of the total expenditure, and presented in a table.

Then, from the total amount allocations for health commodities procurement, the allocations was categorized by facility type and presented in a table showing the total allocations for hospital, health centres and dispensaries in figure and percentages.

Then the sources of funds that that were allocated for heath commodities were determined by calculating the amount of funds for each complementary fund source such as ICHF, NHIF, and health sector basket funding.

3.11.2 Qualitative data analysis

An inductive thematic analysis was used to analyze results from an in-depth interview using the **NVivo software version 12.** Recording and written notes data were transcribed into text in Swahili language and then translated in English. This was followed by familiarization of data, generation of coding, then codes were merged to sub-theme and then into themes, which were reviewed, named and described to produce meanings according to research questions(26). Then meanings extracted from themes were presented in text. This was used for objective four on identification of the facilitators and barriers of successful implementation of the redesign system as perceived by personnel from MSD and public HFs.

3.12 Ethical clearance

The ethical clearance was obtained from Ethical Review Committee of Research and publication of Muhimbili university of health and allied sciences, medical stores department, regional Administrative Secretary of Mwanza, District Executive Director of Magu DC and written consent was sought from person to be interviewed; supply chain staff from MSD (manager, sales officers, warehouse officers) was obtained from healthcare facilities staff (facility-in-charge, pharm/lab tech and store personnel) before commencement of data collection and only those who gave their informed consent were allowed to interviewed. Numbers were assigned to the study participants to ensure confidentiality.

CHAPTER FOUR

4.0 FINDINGS

4.1 QUANTITATIVE FINDINGS

4.1.1 Distribution of health facilities

In the financial year 2022/2023, Magu district council had a total of 48 health facilities. However, one health facility was excluded from the study because the facility did not submit the bimonthly reports throughout the year, therefore was not eligible for the study. The study included a total of 47 health facilities. The majority of these were dispensaries comprising, 40 (85%) of the total sample. Health centres made up 6 (13%) of the facilities while hospitals accounted for the remaining 1 (2%) of the facility.

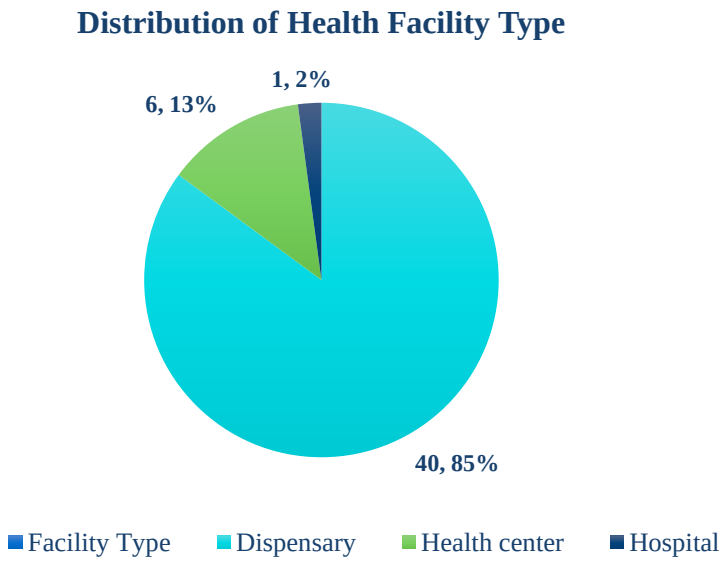


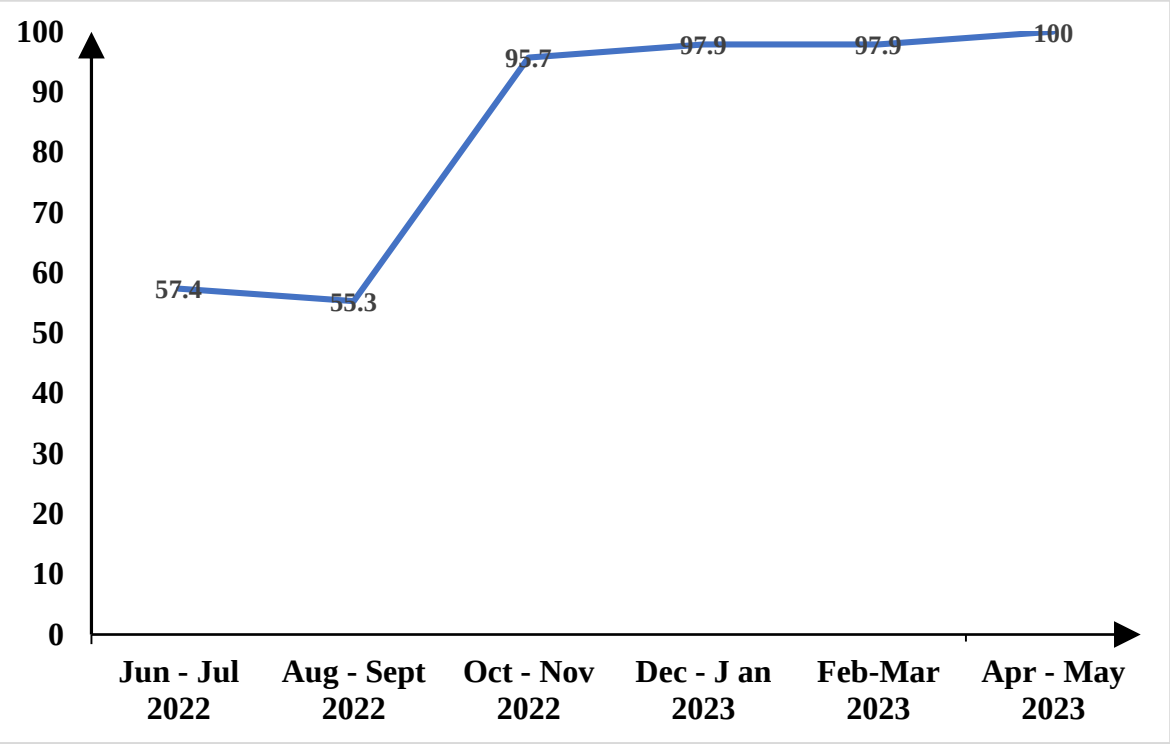
Figure 2: Distribution of health facilities

4.1.2 Trend in HFs submission of bimonthly reports to MSD as per redesign system

The average timely submission of bimonthly reports to MSD showed a slightly decreasing trend from 57.4% in June-July 2022 to 55.3% in August-September 2022. Then after, there was a significant drastic increasing trend from 55.3% in August-September 2022 to 95.7% in October -November 2022. From December-January 2023 to February-March 2023 the

timely submission of bimonthly reports to MSD remained high at 97.9% , eventually reached at 100% in April-May 2023.(Figure 3)

Figure 3: Average percentage of health facilities submitting bimonthly reports on time to MSD by reporting periods



On the other hand, there was slight increase in late submission of bimonthly reports from 36.2% in June-July 2022 to 38.3% in August-September 2022. By October-November 2022 there was a dramatically decrease of late submission of bimonthly reports to 2.1% and from December 2022 onward there were no late submission of bimonthly report at all. Few health facilities did not submit bimonthly reports during the reporting period, and the trend remained low throughout the year. It started at 6.4% in June-July 2022, remained the same in August-September 2022 and then dropped to 2.1% from October 2022 to March 2023 eventually reaching 0% by April-May 2023.(Table 2) next page

Table 2: Trend in HFs submission of bimonthly reports to MSD as per redesign system for the financial year 2022/2023

Reporting period	Variables	Health facility type						Average	
		Dispensary		Health center		Hospital			
		N	%	N	%	N	%	N	%
Jun-Jul 2022	Yes on time	22	55.0%	4	66.7%	1	100.0%	27	57.4%
	Not on time	15	37.5%	2	33.3%	0	0.0%	17	36.2%
	None reporting	3	7.5%	0	0.0%	0	0.0%	3	6.4%
	Total	**40**	**100.0%**	**6**	**100.0%**	**1**	**100.0%**	**47**	**100.0%**
Aug-Sept 2022	Yes on time	23	57.5%	3	50.0%	0	0.0%	26	55.3%
	Not on time	14	35.0%	3	50.0%	1	100.0%	18	38.3%
	None reporting	3	7.5%	0	0.0%	0	0.0%	3	6.4%
	Total	**40**	**100.0%**	**6**	**100.0%**	**1**	**100.0%**	**47**	**100.0%**
Oct-Nov 2022	Yes on time	38	95.0%	6	100.0%	1	100.0%	45	95.7%
	Not on time	1	2.5%	0	0.0%	0	0.0%	1	2.1%
	None reporting	1	2.5%	0	0.0%	0	0.0%	1	2.1%
	Total	**40**	**100.0%**	**6**	**100.0%**	**1**	**100.0%**	**47**	**100.0%**
Dec-Jan 2023	Yes on time	39	97.5%	6	100.0%	1	100.0%	46	97.9%
	None reporting	1	2.5%	0	0.0%	0	0.0%	1	2.1%
	Total	**40**	**100.0%**	**6**	**100.0%**	**1**	**100.0%**	**47**	**100.0%**
Feb-Mar 2023	Yes on time	39	97.5%	6	100.0%	1	100.0%	46	97.9%
	None reporting	1	2.5%	0	0.0%	0	0.0%	1	2.1%
	Total	**40**	**100.0%**	**6**	**100.0%**	**1**	**100.0%**	**47**	**100.0%**
Apr-May 2023	Yes on time	40	100.0%	6	100.0%	1	100.0%	47	100.0%

4.1.3 MSD adherence to the proposed distribution schedule in the redesigned system

The results indicated that out of 348 total deliveries analyzed across all health facility types, 142 (40.8%) were delivered on time while 206 (59.2%) were not on time. Dispensaries indicated challenges with deliveries where, out of 233 total deliveries, 160 deliveries (68.8%) were not on time while 73 (31.3%) were on time. Health centres indicated a more balanced performance where, out of 80 deliveries, 43 (53.8%) deliveries were on time and 37 (46.3%) deliveries were not on time. Hospitals indicated a highest compliance of MSD to timely delivery were out of 35 deliveries, majority 26 (74.3%) were on time compared to 9 (25.7%) which were not on time.(Table 3)

Table 3: Timeliness delivery of health commodities by facility type (n=counts)

Facility type	Timeliness in delivery				
	On time delivery		Not on time delivery		Total
	n	(%)	n	(%)	n
Dispensaries	73	(31.3)	160	(68.7)	233
Health centers	43	(53.8)	37	(46.3)	80
Hospital	26	(74.3)	9	(25.7)	35
Total	142	(40.8)	206	(59.2)	348

Note: The level of adherence has been measured by turnaround time of 20 days (from 11th to 30th each ordering month), more than 20 days means the commodities are not delivered on time. Receiving within 20 days of the same ordering month means that the commodities have been received on time.

4.1.4 Uptake of complementary funds for purchase of commodities by HFs for financial year 2022/2023

The study analyzed the trends of complementary funds utilization by health facilities in procuring heath commodities. The finding of the study has revealed that in the financial year 2022/2023, overall, health facilities within Magu district council accounted for only 11.1% of the total expenditure for purchasing heath commodities and the remaining (88.9%) of the revenue collected was utilized for procurement other commodities. The funds utilized for

health commodities was contributed mostly contributed by council (23.7%), followed by health centres (12.1%) and lastly the dispensaries (2.5%). (Table 4)

Table 4: Health commodities expenditure as percentage of total expenditure for all HFs

Health facility types	Health commodities expenditure (N)	Other commodities expenditure (N)	Total expenditure (N)	% Health commodities expenses as of Total expenditure	% other commodities expenses as of Total expenditure
Council Hospital	119,841,502.00	385,780,285.90	505,621,787.90	23.7	76.3
Health center	73,126,853.20	533,358,571.40	606,485,425.00	12.1	87.9
Dispensary	20,248,919.60	790,691,622.80	810,940,542.40	2.5	97.5
Total	213,217,274.80	1,709,830,480.10	1,923,047,755.30	11.1	88.9

Moreover, the results indicated that health sector basket fund was the highest source (43.5%) of funding for procurement of health commodities , followed by user fees (28.9%) and NHIF (27.4%). Additionally, Community Health Fund (iCHF) was not utilized for purchasing health commodities for the whole year.(Table 5)

Table 5: Health commodities expenditure as percentage of total expenditure by fund source

Fund Source	Health commodities expenditure	
	N	percent
Community Health Fund - iCHF	0	0.0
Health Sector Basket Fund	93,038,118.58	43.6
National Health Insurance Fund - NHIF	58,498,572.2	27.4
User Fee	61,680,584	28.9
Total	213,217,274.78	100

4.2 QUALITATIVE FINDINGS

This subsection presents the qualitative findings of the study. The presentation of the findings on the barriers and facilitators of successful implementation of the redesigned logistics system in Magu District council were explained by interviewing staff from MSD and Public HFs. The findings are based on the analysis of the responses on practices and experiences of the respondents toward the successful implementation practices of the redesigned logistics system.

4.2.1 Professional description of Participants

The staff having first-hand information on the practices of the redesigned logistics system were selected for interview. A total of 15 participants; 8 from MSD and 7 from HFs were interview using the In-depth interview techniques. Their job position ranged from professional ranged from accounting officer, warehouse officers, sales officers from MSD and Facility-in-charges, Store, Pharmaceuticals and Lab personnels from HFs.

4.2.2 Codes, sub-themes and themes

The participants underwent the in-depth interviews. The Recording and written notes of the interviews were transcribed into text in Swahili language and then translated in English. This was followed by familiarization with the data, coding, then codes were merged to sub-theme and then into themes, which were reviewed, named and described to produce meanings according to research questions(26). The following are the codes, sub-themes and themes on barriers and facilitators of the successful implementation of redesigned logistics system as indicated in Table 6.

Table 6: Codes, Sub-themes and themes

Codes	Sub-theme	Themes
Definition of redesign system	**Meaning of the redesigned ILS**	**General understanding of redesigned system functionality and processes**
Redesigned Ordering and distribution groups of HFs		
Redesign system ordering and distribution cycle		
Ordering and distribution cycle timelines	Understanding the ordering and distribution cycle deadlines	

Codes	Sub-theme	Themes
Disruption of normal ordering and distribution cycle	Supply chain challenges	Barriers to the successful implementation of the redesigned ILS
Delivery of near to expiry commodities		
Delayed submission of bimonthly orders		
High workload	Human resource challenges	
Large coverage area		
Resistance to change		
Road infrastructure limitation	Infrastructural limitations	
System and network issues		
Provision of incentives and benefits	Human resource factors	Facilitators of successful implementation of redesigned ILS
Staff responsibility and ownership		
Organizational culture	Behavioural factors	
Staff Proactiveness		
Regular communication		
Internal and external pressure		
Availability of vehicles	Infrastructural factors	
Increased cost of equipment	Planning flexible budget to accommodate the unforeseen circumstances	Suggestion on areas for improvement
Maintenance cost for vehicles		
High workload and large coverage area	Construction of the additional distribution zone	
Regular communication	Conduct regular stakeholders meetings	
Commitment among staff	Commitment and willingness among staff	
Increasing debt from health facilities	MSD improved debt collection from health facilities	
Short distribution timeline	Extension of distribution deadlines	

Theme 1: General understanding of redesigned ILS functionality, processes and practices

Overall, respondents from health facilities and MSD understand the fundamental meaning of the redesigned ILS with most of them possessing the ability to explain the system functionality, processes involved with timeline and the practice in general.

Sub-theme 1.1: Meaning of the redesigned ILS

The findings presents the definitions and explanations from the respondents showing the understanding of the redesigned ILS processes and timelines. One of the respondents said:

"it is a system prepared by the Ministry of Health with the goal of capturing or monitoring the entire trend of medicines and medical supplies at health facilities, from health centers to referral hospitals. With this redesign, reports are submitted every two months....At the beginning of the fiscal year, for example, in the Mwanza region, we have Group A and B. In the Mwanza region, we serve five regions: Mwanza itself, Mara, Shinyanga, Simiyu, and Geita,.Simiyu, Shinyanga, and Geita are Group A…Mwanza and Mara are Group B…During the reporting and requesting period, which we call a circle, we have six circles. Each center is supposed to receive medicines every two months throughout the year. So, it adds up to six times". (IDI 02, MSD sales officer)

Several participants offered detailed insights into the proposed redesigned ILS timelines for order processing across different facility levels. One respondent explicitly outlined the process.

".....At the center, the process should be done by the 5th. The district should complete it by the 7th for dispensaries and health centers. Hospitals, which don't go through the district, should also be done by the 7th. So, the deadline for centers is the 5th, for hospitals the 7th, and the district finalizes by the 10th."(IDI, MSD SALES OFFICER, MSD sales officer)

Further, some of the respondents knew more details on the redesigned ILS as some went further to describe the system functionality on order generation in eLMIS and convention into Epicor 10 system at MSD . Describing this situation, one respondent said:

"Every two months, health facilities are required to provide reports. From these reports, an order is generated. This order is converted into the eLMIS system and then into the MSD

system… In the Epicor 10 system, the amount requested is entered. If a center makes an order but only provides information without finalizing it, the Epicor system will indicate that there is no order." (IDI 01, MSD sales officer)

Moreover, few participants understood the background history of health commodity supply chain system and went further describing the aims of the redesigned ILS. One respondent described the background.

".Previously, we used to call it "indent" before ILS. So, it incorporated programs under one roof, meaning one order. But initially, we used to have that indent where malaria, for instance, had its own separate route. Everything used to go separately, so ILS consolidated these to integrate systems, and initially, we used to save for four times a year, meaning quarterly……Then later, stakeholders, PO-LARG, the ministry of health, they changed the supply policy and embarked on this redesign system which became six times, where every two months they get supplies. The main goal was to handle the situation of facilities being out of stock; some facilities don't have the capacity to store stock for three to four month" (IDI 09, MSD Accounting Officer)

Furthermore, most respondents possessed the knowledge of health commodities ordering methods that were used before and after the redesigned system. They described the current ordering system that is being used in the redesigned system and compared it to the previously used system. One participant described the systems;

"When they report and request, as I mentioned every two months, each center will tell us, initially, we used two systems of ordering, called push and pull. Push means we at MSD give the center regardless of their request, if we give them 20, they have to accept it. But pull is when the center themselves say they want ten Paracetamol, fifty Amoxicillin, according to their needs. So, as they report now, they will report how many tablets they used, thirty left with twenty to be needed again. So, at the end of the day, when we print, we see how many requests come to us."(IDI 02, MSD Sales Officer)

Other respondent went further to describe the order handling procedure at MSD: One respondent said:

*"……our practice of operating on a FIFO (First In, First Out) basis. This means the first customer to submit an order is the first one we serve."(*IDI O6, MSD SALES OFFICER, MSD warehouse Officer)

Another respondent said:

" *……We process from the 11th to the 30th. Processing involves moving orders to the warehouse, picking items, preparing invoices, and handling logistics like vehicle fuel and allowances for those making deliveries. There are many steps involved……..Ah, hospitals like hospitals, starting with, once it's called a hospital, they go to the material queue, meaning they go individually……Material queue means the order in which items are picked up. I can explain more for others to understand. So, when picking items from the warehouse, they are picked only for that specific center……the district needs to wait for all the centers to submit their orders, except for the district hospital. Health centers and dispensaries must all submit their orders first. We process each order individually, then combine them into what we call a "case" so they are processed as one unit at the warehouse…..Once picked, items are then separated by center at the ILS packing area, where workers separate and pack them according to each center's needs."*(IDI 01, MSD sales Officer)

Some respondent went further to describe the order handling procedure for the late submitted orders to MSD: One respondent stated:

"If a few centers are late, we handle them individually, like we do for hospitals" (IDI 01, MSD Sales Officer)

Sub-theme 1.2: Understanding ordering and distribution cycle deadlines

Overall, most of the respondent declared that the health facilities have improved in reporting submission timeliness compared to before. One of the respondent said:

"…trend shows an increase and improvement in timely ordering"(IDI O6, MSD warehouse Officer)

Also, most of the respondents declared that MSD has improved the distribution of health commodities at the health facilities. One of the respondent said:

"Most of the time, they deliver on time, although sometimes they are late, but not very often" (IDI 13, Health facility- in-Charge).

Also, Some respondents went further and described the issue of out of stock of sometime despite the improved distribution frequency. One of the respondent said:
"……the availability of products is a challenge. Often we receive many OS (Out of Stock), you order products and then get many OS" (IDI 04, Health Facility-in-charge)

Theme 2: Barriers to the successful implementation of the redesigned ILS

This sub-section presents the findings on the perceived challenges that hinders the successful implementation of the redesigned ILS from the MSD and HFs staffs. It was evident that the implementation of redesigned ILS faced a number of challenges that influence its successful implementation. Overall, most respondents from health facilities and MSD mentioned disruption of the normal ordering and distribution cycles, high workload, infrastructural challenges, limited vehicles, resistance to change, system and network issues, and delivery of near to expiry commodities as among the challenges faced during the implementation of redesigned ILS that hinders its successful implementation.

Sub-theme 2.1: Supply chain challenges

- ***Disruption of the normal ordering and distribution cycles***

The findings present that disruption distribution cycle may lead to commodities distribution delay; some respondents went further describing how these disruption occurs. One respondent talked about the back orders as the reason for disruption of the normal distribution cycle and reported:

".....there is a matter where you find you are serving a certain district, you finish, and you send it there, and then it turns out to be an essential drug like oxytocin, First Expire First Out (FEFO), I don't know Artemether Lumefantrine (ALU), I don't know Sulphadoxine Pyrimethamine (SP). They come; you have to start returning those orders to the system and give them those orders again……So, in such environments, it pulls us back" (IDI 03, MSD Warehouse Officer)

Also, another respondent said:

".....Some centers can't go to other suppliers, so if we give them an OS (Out of Stock) notice, they keep asking us, like with RL back orders. They rely on us" (IDI 11, MSD Warehouse Officer)

Some respondents explained that out of stock at MSD as one source of emergence order that distrusts the normal ordering and distribution cycle and hinders the successful implementation of the redesigned ILS since the commodities availability at the centres is not improved. One respondent said:

".....the availability of products is a challenge. Often we receive many OS (Out of Stock), you order products and then get many OS, and you don't meet your expected targets" (IDI 04, Health facility pharmaceutical personnel)

Moreover, some respondents went further describing the allocation of commodities purchased by the ministry of health and PO-LARG as another reason for the disruption of the normal distribution cycle. This is because they are un planned and they come with distribution directives and they need to be accomplished within the 20 days distribution timelines thus disrupting the normal distribution cycle of health commodities to health facilities . One respondent said:

"....here's a bit of things that are outside our control, first of all, there's the issue of allocations. Sometimes, when it's allocated, directives come that these should be distributed within this period, so they arrive, they go, and then it comes with directions that these should be distributed within this period.....You might find that you've already finished distributing them in their cycle, then you're forced to go back and take them there again." (IDI 08, MSD sales officer)

- ***Delivery of near to expiry commodities.***

Several respondent highlighted the challenge receiving the near to expire commodities from MSD in the implementation of the redesigned ILS. One of the respondent went on further explaining that circumstances where personnel may overlook the expiration date and ending up receiving the nearly expired commodities that may later lead to wastage due to spoilage.

".....My colleague is alone, maybe she has a parent there who is giving birth, and you hand over the medicine at that time, she may not check the expiration date because there are other urgent matters here, maybe someone is giving birth, so you might be surprised, it's a small mistake, but it can lead to a big disaster because she didn't check and she is satisfied that

she has received the shipment. Most of the medicines they bring to us have a long expiry date, but sometime they bring but after one or two months they spoil"(IDI 05, MSD sales Officer)

- ***Delayed submission of bimonthly orders***

Some respondents mentioned that delayed submission of order by health facilities lead to the delayed distribution of the commodities to health facilities because they tend to increase the turnaround time for delivery of commodities. Two respondents said:
".....There are centers that sometimes fail to report on time, which often means either there will be a delay in delivery" (IDI 02, MSD sales officer) *"....when lead time increases, it means they are above the Turn Around Time days allocated. So, if they delay, it means their TAT will also increase"*(IDI 03, MSD warehouse Officer)

Another respondent went further mentioning that the delay occurs more often with the new centers due to their struggle in submission of the orders thus leading to the delayed delivery of commodities thus negatively affecting the successful implementation of the redesign ILS
".....Delays usually happen with new centers, which often struggle to submit their reports and orders on time, affecting timely delivery" (IDI 05, MSD sales Officer)

Sub-theme 2.2: Human resource challenges

- ***High workload***

Some respondents explained the issue of high work load at the MSD Mwanza zone office as one of the limiting factor of successful implementation of the redesigned ILS . This is because Mwanza zone serve many customers compared to other MSD zonal offices. One respondent went further describing the list of customer serviced by Mwanza region and said:
"……..It's the workload. Processing customer orders. Here we have Group A and B. Customers, maybe 1,350. Each group has 650…….But the other is operational, which is physical. There are trucks that need to bring the goods from the headquarters, offloading the goods, organizing them, then... all that physical work……Once you're in the sales location, meaning once you enter the system, the salesperson should be able to access it so they can release the orders for processing to the end." (IDI 08, MSD sales officer)

Another respondent went further describing the work load during customer order processing at MSD zone offices and reported:

"……..On the other hand, within the twenty days that MSD needs for order processing, salespeople must finish line by line, then bring it to the warehouse people to do picking, sorting, and packing……..After finishing that, they proceed to do loading and prepare documentation because all these goods require documentation. For one station among these thousands, there are almost eight copies of the invoice, four copies of the delivery note, and there are people who need to sign, with one person assigned to sign all those documents. In the document, each person needs to sign four or three invoices……for one invoice. Take out four copies, and there are four delivery notes. That means the entire document must be signed by one person. Not just one person; there's a dispatch supervisor signing eight signatures. Then there's someone from management who signs eight signatures. So, it is a tedious task of preparing documentation for the district." (IDI 06, MSD Sales Officer)

- ***Resistance to change***

One respondent mentioned the issue of resistance to change could be one the hindering factor in the successful implementation practice of the redesigned ILS and the respondent said:

".....Humans are resistant to change. Initially, we tried to discourage them because we serve every two months, and the workload is heavy, so we didn't see the need for them to request in the middle of those two months" (IDI 05, MSD sales Officer)

Sub-theme 2.3: Infrastructural challenges

- ***Road Infrastructural limitations***

Most of the respondents mentioned the road infrastructure challenge especially during rainy reason as one of the limiting factor in the successful distribution of the health commodities to health facilities. One respondent said:

"There are many challenges. The first one is the road infrastructure.....The condition of the roads, especially during the rainy season. For example, you allocate a truck three or four days for a trip, but it gets stuck…….It gets stuck. Or it may not get stuck, but the truck has to park far away, and the goods need to be transported by other means, which takes more time." (IDI 01, MSD Sales Officer)

Another respondent went further describing the scattered and hard to reach areas as limiting factor for successful distribution of health commodities, the respondent said:
"They are scattered and hard to reach areas too, areas like islands in the Mwanza region, that a vehicle can't even get there, no matter what, because there's no ferry, there's just a canoe, so distribution costs must increase. Every box, five thousand shillings to cross to deliver elsewhere, you pay the owner of the canoe and his assistant comes, they cross themselves, and go". (IDI 09, MSD Accounting Officer)

- ***System and network issues***

Most of the respondents from the facilities mentioned the challenges of network hinders the successful implementation of the redesigned ILS : One respondent said:
"challenges are just the usual ones like network issues" (IDI 12, Health facility stores Personnel)

Further, another respondent went further to describe the issue of the system not containing all items as he limiting factors in order processing and reported:

"... some items that sometimes do not enter the system……When you come to check, Here, you find, look from the beginning to the end, it's not there, but there's a part where you can go, this order, you can pull out just that part where they report and request. When you look, the item is there, and the customer has actually requested it. Do you understand?..... Also, there are cases like here, it's written two hundred fifty-six lines, but when you pull it into the system, you might find it's entered as two hundred fifty-three" (IDI 02, MSD Sales Officer)

Furthermore some respondents mentioned the issue of system integration between Epicor and eLMIS. One respondent said:

"there are complaints from some system users that the system reports and Epicor reports don't read well. You might check a report in the system and find that the same report in Epicor doesn't read well" (IDI 06, MSD Sales Officer)

Theme 3: Facilitators of successful implementation of redesigned ILS

The findings of this study presents the key factors that positively influences the successful implementation practice of the redesigned ILS as perceived by the personnel from MSD and health facilities. The factors include availability of vehicles, responsibility, culture, staff motivation, human resource management, internal and external follow up, proactiveness and regular communication . Below are the detailed explanations from the respondents.

Sub-theme 3.1: Human resource factors

- ***Provision of incentives and benefits***

Overall, most respondents explained that human resources management is important for the successful implementation of the redesigned ILS. This may include provision of incentives, ensuring placement of staff aligning with their job description. This enhances a motivated workforce that is skilled, engaged and committed within the redesigned ILS hence its successful implementation. One respondent said:

"the employer helps. For example, there are those food incentives given to employees, you meet over a cup of tea, it motivates. For instance, if maybe we didn't have food at the office, people would probably leave at seven to go eat" (IDI 07, MSD warehouse officer*)*

- ***Staff responsibility and ownership***

Several respondents mentioned that staff responsibility significantly contributes to the successful implementation of the redesigned ILS . They explained that responsibility fosters accountability, commitment and dedication among personnel from the MSD and health facilities. All these are very crucial for the successful implementation of the redesigned ILS taking in consideration the timelines set for ordering and distribution cycle. One respondent said:

"The role of MSD, first of all, even though bringing orders is their responsibility, MSD also has a significant part in reminding and giving information that……our first responsibility is also to remind them and emphasize that they bring it on time so that we can meet the deadline" (IDI 08, MSD Sales Officer)

Sub-theme 3.2: Behavioural factors

- ***Organizational Culture***

Some respondents mentioned culture of an organization significantly contributed to the successful implementation of the redesigned ILS. Some respondent said that understanding the cultural norms of the organization such as work habits affects the employee approaches towards their responsibilities, behavior and productivity. The positive organizational culture motivates staff, enhances commitment and helps aligning their efforts with the target.
One other respondent said:

"……The culture of the place, if you know the culture, for example, in Mwanza, when you leave office at 12, you feel like you've escaped……..When I go to the office, I know when to enter, but when to leave, I don't. It's one of the biggest factor because if someone can work until 12, it means when they leave, they might influence someone else to leave at three, but if you were there, maybe both could leave at two…….culture helps, motivates people" (IDI 07, MSD Warehouse Officer)

- ***Proactiveness***

Several respondents explained that proactiveness contributes significantly to the successful implementation of the redesigned ILS. By encouraging early submission of the order s through reminders helps staff to ensure deadline are met. Also, respondents admitted that the approach helps minimize delay leading to a more smoother order processing and delivery within the deadline. One respondent said:

"……..We ask them not to wait for the deadline and to submit early, but as long as they are within the limit, there's no issue……So, we are proactive to meet the deadline" (IDI 07, MSD Sales Officer)

- ***Regular communication***

Overall most respondent said that communication with the internal and external stakeholders was the key for the successful implementation practice of the redesigned ILS. One respondent said:

"…….Communication is the main thing because the main thing we do more is communication. It's a continuation business with our customers, so if it's a continuation business, it's different from a one-time business, meaning I sell you a piece of land, we're

done, goodbye. For us, it means I sell to you today, tomorrow I'm with you, the day after tomorrow I'm with you, so we need good communication."(IDI 06, MSD Sales Officer)

- ***Internal and external pressure***

Some respondent explained that pressure from internal and external environment pushes them to meet the deadlines proposed in the redesigned manual and hence is among the factors that enhances the successful implementation of the redesigned ILS. One respondent said:

"……the schedule itself and the follow-up from our SMO department, which ensures timely commodities delivery……..external pressures from the Ministry of Health and PO-LARG, requiring us to deliver on time" (IDI 05, MSD sales Officer)

Sub-theme 3.3 Infrastructural factors

- ***Availability of vehicles***

Overall, most respondents mentioned availability of vehicles as one of the contributing factor to the successful implementation practice of the redesigned ILS. This is because vehicles ensures the timely distribution of commodities to health facilities which is an important criteria in the redesigned ILS. Also, most of the respondent admitted that previously there was inadequate number vehicles designated for distribution of commodities in Mwanza zone, but currently the issue has been resolved thus contributing to the successful implementation of the redesigned ILS. One respondent said:

"Issues with vehicles seem to be resolved…..(IDI 03, MSD Sales Officer)

Theme 4: Suggestions on areas of improvement

Overall, majority of the respondents perceived that successful implementation of redesigned ILS hinges on addressing the challenges and utilization of the opportunities for improvement. Through several interviews conducted with personnel from health facilities and MSD, that are involved in implementation of redesigned ILS, several suggestions on the areas of improvement emerged that focuses on enhancing operational efficiency and effectiveness. These include advocating for a flexible budget to accommodate the unforeseen circumstances, fostering commitment and willingness among staff, construction of the additional distribution zone, MSD improved debt collection from health facilities, extension of distribution deadlines and to conduct regular stakeholders meetings.

Sub-theme 4.1: Planning flexible budget to accommodate the unforeseen circumstances

Most respondents from MSD, suggested on planning for flexible budget since there are many unforeseen circumstances during the order processing and distribution to health facilities such as fuel and per diems. This will ensure that the distribution deadlines are well managed. One respondent said:

"distribution is one, drivers, cars, fuel budgets, and per diems...the budget should be flexible, meaning it should match the reality of the work we do...and maintenance of vehicles, the budget for that should also be good because these vehicles, my friend, you'll find we budget for tires for a year; they don't last, they burst on the road, especially in rural areas. The roads aren't friendly; in some places, there are rocks; tires get cut, so the maintenance budget for vehicles should also be good so that distribution is managed" (IDI 09, MSD Accounting officer)

Sub-theme 4.1: Commitment and willingness among staff

Moreover, several respondent nailed on the commitment and willingness among staff as one the areas that need to be encouraged among the personnel. The willingness of staff to accept the change will enable them to be responsible on the assigned activities hence make the redesigned ILS possible and successful. One respondent said:

"My opinion is that this system is not bad, it's good because its goal is to ensure that centers have medicines. That's why they increased the cycles; previously it was four times, now it's six times. This ensures that the customer receives the service. So my opinion is that if any zone is failing, redesign is possible. In Mwanza, we were the first to start this redesign. We began in the Mwanza zone, so it is possible….it is possible, and all the resources and people were willing" (IDI 05, MSD Sales Officer)

Sub-theme 4.3: Construction of the additional distribution zone

Several respondents from MSD suggested that additional zonal office be constructed to lessen the burden of Mwanza zone. Since it serves many customers from five region including Mwanza, Shinyanga, Simiyu, Geita, and Mara so the coverage area is large. One respondent said:

" We wish that MSD reduces the workload by creating another zone" (IDI 05,MSD Sales officer)

Sub-theme 4.4: MSD improved debt collection from health facilities

The issue of debt collection from the facilities was among the areas for improvement highlighted by MSD respondents. The suggestions was that MSD should not end up with memorandum of understanding with facilities with regards to debts, instead a specific debt collection unit should be initialized by MSD that will be responsible for aggressive debt collection. Also, the MSD Strategic Management Office should make targets for debt collection and ensure effective follow up with the unit regarding the debt collection status. The respondent said:

"there is a system that needs to change in terms of debt collection. We should not end with a Memorandum of Understanding….. in MSD we have something called Strategic Management Office, right?.....if it pressures them to look at whether the institution's goals are really being met. ….So, it means that there should be a debt monitoring unit as a whole unit, very specific, their job is to follow up on debts. They're the ones to be asked why a debt hasn't been paid."(IDI 07, MSD sales officer)

Sub-theme 4.5: Extension of distribution deadlines

Few respondents highlighted the need for extension of distribution timeline from twenty days and some said 30 days. This would ensure timely distribution of commodities to health facilities taking consideration of Mwanza zone which has large coverage area and many customers from five regions. One respondent said:

"My opinion is, there was something that was discussed but lost momentum. But because you are stakeholders and researchers, it can gain strength. MSD began with an approach of requesting the twenty days to be extended to twenty-five days because we are measured by those twenty days. Because from the first to the fifth of the month, MSD has no work to do"(IDI 01, MSD Sales Officer)

Sub-theme 4.6 Conduct regular stakeholders meetings

Overall, majority of the respondent highlighted the area of conduct regular stakeholders meeting may help to improve communication, understanding and compliance to the

redesigned guidelines . This will ensure that customers receive the required services timely. One respondent said:

"Regular meetings involving the stakeholders to improve communication and understanding." (IDI 05, MSD Sales Officer)

CHAPTER FIVE

5.0 DISCUSSION

5.1 Trend in public HFs submission of bimonthly reports to MSD as per redesign system

The study revealed that health facilities in Magu District Council successfully implemented the redesigned Integrated Logistics System during the 2022/2023 financial year. After a slight decrease in reporting timeliness between June-July and August-September 2022, there was a sharp increase from August-September to October-November 2022. This positive trend continued, reaching 100% by the end of the year. Several participants highlighted the facilitators to this improvement included proactive staff encouraging early order submissions to MSD, consistent communication between stakeholders, and strong staff commitment and ownership.

Despite the rising trend in reporting compliance some challenges remains such as; network issues, high work load and new staffs were reported to hinder timely submission of reports. To overcome these, MSD and HFs staff have been proactive in encouraging early submission of bimonthly report through the electronic system by opening work-based groups on social network. This has eased the communication between MSD and HFs staffs, where reminders and status of the report submissions rate are shared to all members. Studies with other regions and countries further underscores the advantages of digital logistics management systems like in Pakistan, the contraceptives logistics management information system increased reporting rates from 71% to 99% while South Africa stock visibility solution (SVS) improved vaccine delivery at SDPs despite obstacles such staff shortages(20,21).

Further studies in Tanzania reported that the use of electronic system in data reporting has increased data visibility to both MSD and HFs compared to the previously paper based utilized information system with HFs were inexperienced in inventory management and record keeping(7). It was reported that the reconfigured e-LMIS system in Tanzania had increased the timely reporting rate to 98%. The improvement in reporting compliance

witnessed in Magu district are consistent with similar resulting showing the relevance of redesign in logistics management. However issues identified in South Africa and Tabora region in Tanzania shows that addressing staff shortages and providing timely supervision are important for maintaining and improving the reporting timeliness and overall supply chain efficiency(18).

5.2 MSD adherence to the proposed distribution schedule in the redesign system

MSD adherence to the proposed distribution schedule in the redesigned ILS is the second step in implementation of the redesign ILS. MSD staffs as players in the redesigned ILS must be must understand the order processing procedures and deadlines for them to comply with distribution of health commodities to all facilities within deadlines. On 11th day of each reporting month MSD has to have all orders converted to Epicor-10 system for them to proceed with order picking, packing, document preparation and distribution to all facilities within 20 days and complete all the deliveries within the reporting month (30th or 31st)(4).

The analysis of MSD adherence to the distribution schedule indicate significant challenges in the timely delivery of health commodities. The study indicates that majority of deliveries 206 (59.2%) were not on time compared to 142 (40.8%) that were on time. MSD staffs clearly stated that they have been facing challenges in meeting the 20-turnaround time. These included large coverage for Mwanza zone contributing to high workload for staffs, disruption of the distribution cycle from unforeseen circumstances such as delayed allocation of funds from Ministry of Health, back orders, emergence orders, road infrastructure challenges especially in rainy season, budget constraints for maintenance of vehicles and delayed submission of bimonthly report from facilities.

Despite these challenges MSD has been struggling to meet the deadline by being proactive through encouraging early order submission by HFs, committed and willing to work extra hours and also support from employer such as provision of working tools, training, incentives and benefits on time were some of factors that positively impacted the implementation of the redesigned ILS. Also, studies showed that despite the delays, the completeness of deliveries was maintained, with all facilities fully receiving their invoiced orders with only one rejection and one partially delivery noted.

These findings aligns with the other studies conducted in developing countries where logistical and infrastructural challenges often hinders the timely delivery of commodities to SDPs. For example, a study conducted in Madagascar highlighted similar issues such as geographical barriers, inadequate cold chain equipment and shortage of staff which largely affected the supply chain efficiency(22).

This was trend was also observed in Tabora region in Tanzania where MSD faced several challenges in meeting the 20 days delivery timelines. The challenges included financial challenges, infrastructural challenges during the distribution of commodities to health facilities, delayed submission of orders by health facilities and large coverage area (18).

5.3 Uptake trend of complementary funds in purchasing health commodities by HFs

Uptake of complementary funds by facilities for the procurement of commodities is another feature of the redesigned ILS. The system has increased the visibility of facility own-funds collected from user fees, NHIF, iCHF and donor by health facility staffs. In the redesigned ILS facilities are able to utilize the collected funds for purchase of health commodities in from other suppliers in case they have received out of stock from MSD or receipt in kind funds are not sufficient(4).

The finding of the study revealed that facilities utilization of complimentary funding in health commodities financing was low (11.1%) compared to the other commodities financing (88.9%). These funds were mostly allocated to council hospital, followed by health and lastly the dispensaries. The health sector basket funding being the major source of fund followed by user fees and NHIF.

Comparing with studies in other regions and countries like Indonesia and most low- and middle-income countries reported that various complementary funds are used in health care financing such as out of pocket and government insurance schemes and private insurance schemes have been used a source of funds in healthcare financing. Also a study conducted in Pakistan reported that improve funds visibility played an important role in making informed decision making about allocation of funds for procurement commodities and services at SDPs(23).

The findings from our study is corroborated by another study that was conducted in Tanzania on understanding the implication of the direct health facility financing on availability of health commodities for financial years from 2017/18 to 2020/21 revealed that about 23% of the total expenditure for all facilities in Tanzania was utilized for health commodities procurement. The trend showed that percentage health commodities expenditure increased from 22.5% in 2017/18 to 24.7% in 2019/20 however, decreased to 22.5% in 2020/21(19).

The study from other regions and Tanzania aligns well with the study conducted in Magu district council where heath facilities utilizes the complementary funds as a source of health care financing. Despite, the HCRF guideline on utilization of complimentary funds the procurement of health commodities, the utilization of funds by facilities in Magu DC in the procurement of health commodities was very low compared to the 50% required by the guidelines and the study conducted for the past five year which was about 23%(19).

5.4 The facilitators and barriers of successful implementation of the redesign system as perceived by personnel from MSD and public HFs

The success in implementing the redesigned ILS among the facilities and MSD hinges on addressing the challenges and utilization of the opportunities for improvement. The study conducted among HFs staff at Magu district council highlighted that there was increased availability of health commodities at the facilities despite various logistical and operational challenges that were faced during the implementation of the redesigned ILS. The challenges included high work load, large coverage areas, road infrastructure challenges, budget constraints, network issues, human resistance to change, distribution of short expiry commodities, disruption of the ordering and distribution cycles due to back orders emergency orders and allocations form the ministry and PO-LARG, system challenges and short distribution timeline. Studies from other regions like Zambia, Benin and Mozambique also highlighted the bottlenecks in supply chain such as operational inefficiencies, data quality issues, information gaps among stakeholders, unclear accountability and financial constraints (5–9).

Despite the challenges highlighted there were also the contributing factors to the successful implementation of the redesigned ILS including increased availability of commodities, availability of vehicles and drivers for distribution of commodities, proactiveness and encouraging , sense of responsibility among staff, organization culture motivation, staff motivation, internal and external pressure and regular communication with stakeholders. These factors have positively impacted the implementation of the redesigned ILS by ensuring that bimonthly reports are submitted on time hence allowing MSD to be able to distribute the medicines to health facilities hence increasing the availability of medical supplies to SDPs.

Comparatively studied conducted in other regions such as studies conducted in Benin and Mozambique showed that the success in implementing the informed push system resulted in significant improvement of distribution and decreased the stock out rate at the facilities. Also in Zimbabwe reported that DTTU approach ensured cos effectiveness in distribution of commodities to HFs (9)(11).

5.5 Strength of the study

The study used of a mixed-methods approach, combining quantitative and qualitative data, allows for a well-rounded evaluation of the redesigned system. The stratified random sampling of HFs and purposive selection of respondents, including both HFs and MSD staff, ensures a diverse range of perspectives, increasing the relevance of the study.

5.6 Limitations and mitigation

Despite the nationwide implementation of the redesigned system, this study focused on the facilities within the randomly selected Magu district council in Mwanza region excluding other public health facilities. Moreover, only group B facilities were involved in the study leaving out group A facilities and observations were limited to six cycles pertinent to group B. Also, study period was only one year which limited the ability to observe long term trends over extended period of time.

To address these limitation future studies should seek additional funding and collaborate with other institutions to include other districts public health facilities, group A and B

facilities, and extending the observation period to ensure a comprehensive evaluation of the redesigned system and enhance generalizability of findings.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study conducted in Magu district council of Mwanza region demonstrate the successful implementation of the redesign ILS in improving the availability of heath commodities at SDPs. This was demonstrated in improved timeliness in reporting for HFs. Most HFs staffs possessed a clear understanding of the procedures for preparing and submission of the bimonthly reports to MSD. This has led to significant improvement in reporting compliance. This highlights the effectiveness of the eLMIS in increasing data visibility among MSD and HFs staffs. Despite challenges such as network issues, high work load and staff shortages, proactive measures such as early submission encouragement and regular communication contributed positively to timely submission of bimonthly reports.

However, the adherence of MSD to proposed distribution schedule in the redesign revealed significant challenges in meeting the 20- or 21-days TAT with majority of deliveries delayed. These were said to be attributed by challenges such as Human resource challenges like high work load, infrastructural challenges (large coverages area and poor road conditions especially during the rainy seasons, hard to reach areas that requires other means of transport other than cars), supply chain challenges disruption of the normal distribution cycle caused by emergence orders, back orders and allocations from the MOH and POLARG.

Additionally, HFs within Magu district council utilized low funds for health commodities procurement compared to 50% requirement of the guideline for health sector basket funding and 35% for other complementary funds such as user fees and NHIF that took a small share.

Although, the study demonstrated improved timeliness in reporting, it also indicated that redesigned system has positively impacted health commodity availability at SDPs. The system has facilitated more regular deliveries to HFs, reducing the frequency and duration

of stockouts at SDPs. As a result, the stockout levels have been significantly reduced, ensuring better commodity availability for service delivery**.**

6.2 Recommendations

This study provided important information regarding the practice of the implementation of the redesigned logistics system by HFs and MSD in Magu district council of Mwanza and similar regions of Tanzania. It therefore recommends the following:

6.2.1 Health facilities:

1. Health facilities should seek mentorship/ training support from RHMT and CHMT regarding the proper ways of filing the R&R using the actual consumption data from daily dispensing register. This will help to reduce the emergence orders caused by improper filling of consumption data.
2. Health facilities should be made aware that the 20 days of distribution of health commodities include weekends therefore the staff at the health facilities should be flexible in receiving commodities especially when are delivered on weekends.
3. Strengthen communication with MSD so as to streamline the logistics operations.
4. Increase the use of complementary funds by complying with requirement of the guideline and by addressing barriers and developing action plans.

6.2.2 Medical store department

1. Optimize the distribution efficiency by addressing the challenges of human resource especially for areas with large coverage areas like Mwanza zone.
2. Seek support from authorities regarding the road infrastructural challenges faced during the distribution of health commodities during the rainy season and also to areas that are hard to reach.
3. Strengthen the Monitoring and evaluation team by establishing a monitoring and evaluation framework that aids in tracking the supply chain performances metrics and aggressive debt collection

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APPENDICES:

APPENDIX I: THE INFORMED CONSENT

Identification number: ……

Greetings!

I am Salama Anyingisye Mwasambili, a student pursuing a master of science in project management, monitoring and evaluation in health at Muhimbili University of Health and Allied Sciences.

Purpose:

This study aim to assess the implementation of the redesigned logistics system

Methods:

The interviewer will conduct and in-depth interview, may record and or write up your responses.

Participation:

Your participation will require you to respond to all questions asked by the interviewer.

Confidentiality:

Your identity will be confidential to investigators and your names will not be disclosed in any research findings.

Expected benefits:

There are no direct benefits for your participation, however, the information you provide will help the healthcare facilities and MSD to improve the implementation of the redesigned logistics system and hence increase. the availability of health commodities at service delivery points.

Risk:

There are no anticipated harm associated with your participation in this study.

Right to withdraw:

You have freedom to choose not to take part or to withdraw from the study at any time without affecting your relationship with the investigators.

Whom to contact:

If you have query or questions you can contact:

Salama Anyingisye Mwasambili, the principal investigator, mobile phone number: 0759-024240, Email: sallym384@gmail.com

And if you have any question about your rights as participants you may contact

MUHAS Chairperson of Research and Publications Committee,

Tel +2552150302-6.

Signature:

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

Signature of Participant……Date…….

Researcher's Signature…….. Date……

APPENDIX II: FOMU YA IDHINI KWA MSHIRIKI

Namba ya fomu: ……

Utangulizi

Salamu!

Mimi naitwa Salama Mwasambili ni mwanafunzi wa shahada ya uzamili katika ufuatiliaji na tathmini ya usimamizi wa mradi katika chuo kikuu cha Afya na sayansi Shirikishi,Muhimbili

Malengo ya Utafiti:

Kutathmini utekelezaji wa mfumo mpya wa usambazaji dawa wa vituo vya afya na bohari ya dawa katika mkoa wa Mwanza

Mbinu za utafiti:

Tutafanya mahojiano ya kina na mahojiano haya ya utafiti huu yatarekodiwa na/au kuandikwa.

Ushiriki:

Ushiriki wako utahusisha kujibu maswali yote ya utafiti utakayoulizwa.

Usiri:

Utambulisho wako utabaki siri ya mtafiti na jina lako halitahusihwa na matokeo ya utafiti.

Faida zinazotarajiwa:

Hakuna faida utakayoipata katika utafiti huu ila taarifa zitakazopatikana katika utafiti zitawasaidia bohari ya dawa ya dawa na vituo vya afya kuboresha utekelezaji wa usambazaji wa bidhaa za afya nchini.

Madhara:

Hakuna madhara yatakayokupata kuhusiana na ushiriki wako katika utafiti huu.

Haki ya kujitoa:

Una haki ya kujitoa katika utafiti huu wakati wowotw bila kuathiri chochote.

Mawasiliano:

Kwa maswali, wasiliana na

Salama Anyingisye Mwasambili, mtafiti mkuu, simu ya Mkononi: 0759024240, Barua Pepe: sallym384@gmail.com

Au

Mwenyekiti wa Kamati ya Utafiti na Uchapishaji, Chuo kikuu cha Afya na Sayansi Shirikishi, Muhimbili-Dar es Salaam, simu +2552150302-6.

Sahihi kwa wanaokubali:

Mimi……nimesoma fomu hii na kuelewa lengo la utafiti huu na maswali yangu yamejibiwa na sasa nakubali kwa hiari yangu kujiunga na utafiti huu.

Sahihi ya mshiriki……Tarehe…….

Sahihi ya Mtafiti……. Tarehe……

APPENDIX III: THE PUBLIC HEALTH FACILITIES INTERVIEW GUIDE

ID NO:

QUALIFICATION…….

TYPE OF THE HOSPITAL: …….

NAME OF THE HOSPITAL: …….

INTERVIEW QUESTIONS:

1. Can you describe your understanding on the redesign system that is implemented by your health facility?
2. How did you become aware of the redesign system? Elaborate
3. Can you describe the process of preparation and submission of bimonthly reports to MSD?
    - In your opinion, what facilitates the timely submission of the bimonthly reports?
    - Are there any obstacles that hinders the timely submission of reports? If yes, Mention
4. Can you describe the process of the health commodities delivery by MSD as per redesign?
    - Have you encountered any issue regarding the timeliness, completeness and accuracy of delivered commodities? If yes, provide examples
    - In your opinion what are the contributing factors that facilitate MSD adherence to the distribution schedule?
    - In your opinion, what challenges hinder MSD in delivery of goods according the proposed distribution schedule?
5. Are there any suggestions for improving the implementation of the redesign system?

APPENDIX IV: MWONGOZO WA MAHOJIANO KWA VITUO VYA AFYA

FOMU NAMBA:

TAALUMA:

AINA YA HOSPITALI: …….

JINA LA HOSPITALI: …….

MASWALI YA MAHOJIANO:

1. Elezea uelewa wako juu ya mfumo wa upya uliotekelezwa na kituo chako cha afya?
2. Ulikuaje kufahamu kuhusu mfumo wa upya? Eleza
3. Je, unaweza kuelezea mchakato wa kuandaa na kuwasilisha ripoti za kila mwezi kwa MSD?

   • Kwa maoni yako, nini huwezesha kuwasilishwa kwa wakati wa ripoti za kila mwezi?

   • Je, kuna vikwazo vinavyozuia kuwasilishwa kwa wakati wa ripoti? Eleza
4. Je, unaweza kuelezea mchakato wa utoaji wa bidhaa za afya na MSD kulingana na upya? • Je, umekutana na shida yoyote kuhusu wakati, ukamilifu na usahihi wa bidhaa zilizosafirishwa? Ikiwa ndio, toa mifano
   - Kwa maoni yako, ni sababu gani zinachangia MSD kuzingatia ratiba ya usambazaji?
   - Kwa maoni yako, ni changamoto zipi zinazozuia MSD katika utoaji wa bidhaa kulingana na ratiba iliyopendekezwa?
5. Je, kuna mapendekezo ya kuboresha utekelezaji wa mfumo wa upya?

APPENDIX V: MEDICAL STORES DEPARTMENT INTERVIEW GUIDE

ID NO:

INTERVIEW QUESTIONS

1. Can you describe your understanding on the redesign system that is implemented by MSD?
2. How did you become aware of the redesign system? Elaborate
3. Can you describe the trend of submission of bimonthly reports by HFs? Have you experience late submission of reports?
    - In your opinion, what facilitates the timely submission of the bimonthly these reports?
    - what obstacles can hinder the timely submission of bimonthly reports from health facilities?
4. Can you describe the process of the health commodities delivery by MSD as per redesign?
    - Have you encountered any issue regarding the timeliness, completeness and accuracy of delivered commodities? If yes, provide examples
    - In your opinion what are the contributing factors that facilitate MSD adherence to the distribution schedule?
    - what challenges hinder MSD in delivery of goods according the proposed distribution schedule?

APPENDIX VI: MWONGOZO WA MAHOJIANO KWA BOHARI YA DAWA

FOMU NAMBA:

MASWALI YA MAHOJIANO:

1. Je, unaweza kuelezea ufahamu wako kuhusu mfumo wa upya wa usambazaji wa bidhaa za afya unaotekelezwa na Bohari ya dawa?
2. Ulikuaje kufahamu kuhusu mfumo wa huu upya wa usambazaji wa bidhaa za afya? Eleza.
3. Je, unaweza kuelezea mwenendo wa kuwasilisha ripoti za kila mwezi katika vituo vya afya?
    - Je, bohari ya dawa imeshawahi kumbana na kucheleweshwa kwa ripoti?
    - Kwa maoni yako, nini kinachowezesha kuwasilishwa kwa wakati kwa ripoti hizi za kila mwezi?
    - Ni vikwazo gani vinaweza kuzuia kuwasilishwa kwa wakati wa ripoti za kila mwezi kutoka kutoka vito vya afya kwenda bohari ya dawa?
4. Je, unaweza kuelezea mchakato wa bohari ya dawa kwenye utekelezaji wa usambazaji wa bidhaa za afya kulingana na mfumo upya?
    - Je, bohari imeshakumbana shida yoyote kuhusu muda, ukamilifu na usahihi wa bidhaa zilizosafirishwa? Ikiwa ndio, toa mifano.
    - Kwa maoni yako, ni sababu zipi zinachangia MSD kuzingatia ratiba ya usambazaji?
    - Ni changamoto gani zinazuia MSD katika utoaji wa bidhaa kulingana na ratiba iliyopendekezwa?

APPENDIX VII: CHECKLISTS

	Reporting period for financial year 2022-2023												
S/No	Name of the HFs	Jun-Jul 22		Aug-Sept 22		Oct-Nov 22		Dec 22-Jan 23		Feb-March 23		April-May 23	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
	Name of data collector:												
	Position/Role:												
	Date of Data Collection:												

	MSD health commodities timely distribution report for financial year 2022/2023									
S/No	**Name of facility**	**Type of facility**	**District**	**Order received date**	**Order distribution date**	**Consistency with bimonthly distribution**		**Turnaround time**	**On time delivery**	
						Yes	**No**		**Yes**	**No**
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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18										
19										
20										
	Name of data collector									
	Position/Role:									
	Date of Data Collection:									

Complementary fund utilization by HFs for financial year 2022/2023										
S/No	**Name**	**Type**	**fund type collected**				**Fund utilized for health commodity procurement**			
			iCHF	**NHIF**	**user fee**	**other insurance**	**iCHF**	**NHIF**	**user fee**	**other insurance**
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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13										
14										
15										
16										
17										
18										
19										
20										
	Name of data collector:									
	Position/Role:									
	Date of Data Collection:									

LIST OF PUBLIC HEALTH FACILITIES INCLUDED IN THE STUDY

S/No	Facility Code	Facility Name	Facility Type
1	MZ510041	KABILA - Health Centre	Health centre
2	MZ510099	NHOBOLA - Dispensary	Dispensary
3	MZ520547	KITONGOSIMA - Dispensary	Dispensary
4	MZ520206	BUHUMBI - Dispensary	Dispensary
5	MZ520208	BUJASHI - Dispensary	Dispensary
6	MZ520247	BUSALANGA - Dispensary	Dispensary
7	MZ520286	CHANDULU - Dispensary	Dispensary
8	MZ520343	IGEKEMAJA - Dispensary	Dispensary
9	MZ520348	IGOMBE - Dispensary	Dispensary
10	MZ520356	IHAYABUYAGA - Dispensary	Dispensary
11	MZ520360	IJINGA - Dispensary	Dispensary
12	MZ520395	ISOLO - Dispensary	Dispensary
13	MZ520501	KIGANGAMA - Dispensary	Dispensary
14	MZ520525	KINANGO - Dispensary	Dispensary
15	MZ520533	KISESA B - Dispensary	Dispensary
16	MZ520552	KONGOLO - Dispensary	Dispensary
17	MZ520582	LUGEYE - Health Centre	Health centre
18	MZ520589	LUMEJI - Dispensary	Dispensary
19	MZ520591	LUTALE - Dispensary	Dispensary
20	MZ520604	MAHAHA - Dispensary	Dispensary
21	MZ520705	MWABULENGA - Dispensary	Dispensary
22	MZ520721	MWAMABANZA - Dispensary	Dispensary
23	MZ520727	MWAMANGA - Dispensary	Dispensary
24	MZ520754	MWASHEPI - Dispensary	Dispensary
25	MZ520885	NYASATO - Dispensary	Dispensary
26	MZ520953	SALAMABUGATU - Dispensary	Dispensary
27	MZ520961	SAYAKA - Dispensary	Dispensary
28	MZ520980	SHISHANI - Health Centre	Health centre
29	MZ521017	WELAMASONGA - Dispensary	Dispensary
30	MZ510045	KAHANGARA - Health Centre	Health centre
31	MZ510064	KISESA A - Health Centre	Health centre
32	MZ510109	NYANGUGE - Health Centre	Health centre
33	MZ410013	MAGU - District Hospital	Hospital
34	MZ520173	BUBINZA - Dispensary	Dispensary
35	MZ521293	MATALE - Dispensary	Dispensary
36	MZ521055	MAGEREZA - Dispensary	Dispensary
37	MZ521251	BUSEKWA - Dispensary	Dispensary

S/No	Facility Code	Facility Name	Facility Type
38	MZ521252	KANYAMA - Dispensary	Dispensary
39	MZ521250	BUGABU - Dispensary	Dispensary
40	MZ521249	SESE - Dispensary	Dispensary
41	MZ521360	JOHN MONGELA - Dispensary	Dispensary
42	MZ521389	ISANGIJO - Dispensary	Dispensary
43	MZ521390	IKENGELE - Dispensary	Dispensary
44	MZ521430	NYANG'HANGA - Dispensary	Dispensary
45	MZ521456	ILUNGU - Dispensary	Dispensary
46	MZ521457	MUGANI - Dispensary	Dispensary
47	MZ521508	LANGI - Dispensary	Dispensary

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Dr. Nahya Salim Mabrouk,
Chairperson, MUHAS Research and Ethics Committee

Muhimbili University of Health and Allied Sciences
DIRECTOR
Research, Publications & Innovations
Box 65001

UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATIVE AND LOCAL GOVERNMENT AUTHORITIES

MWANZA REGION:

Phone;028-2501037/2500686
Fax: 028 – 2541242-2501057
Email: ras.mwanza@tamisemi.go.tz
Please reply to;

REGIONAL COMMISSIONER'S OFFICE:
Regional Drive road.
P.O.Box 119,
33180 NYAMAGANA, MWANZA.

Ref. No. FA.137/264/01

14 Juni, 2024

District Excutive Director
Magu District Council,
20 Bomani Road,
33482 Itumbili,
MAGU, MWANZA

Re; INTRODUCING SALAMA ANYINGISYE MWASAMBILI

Please reference to the above subject.

2. **Salama Anyingisye Mwasambili** is the student at the Muhimbili University of Health and Allied Sciences pursuing **MSc.Project Management Monitoring Evaluation in Health.** One of requirements of her studies is to undertake research.

3. This student is expected to carry out research titled **"Evaluation of the Implementation of the Redesigned Logistics System: A case of Healthcare Facilities and Medical Store Department in Magu District, Mwanza,Tanzania."**

4. You are requested to give him necessary support to ensure the study is successfully done. The ethical clearance for this research is valid for six months from the date of letter.

5. Thank you for your cooperation.

Claudia Kalui
FOR REGIONAL ADMINISTRATIVE SECRETARY
MWANZA

COPY; **Salama Anyingisye Mwasambili**
Catholic University of Health and Allied Science

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote;
Ref. No. HD/MUH/T.565/2022 04TH June, 2024

The Regional Administrative Secretary,
P.O. Box 119,
MWANZA

Re: INTRODUCTION LETTER SALAMA ANYINGISYE MWASAMBILI

We would like to inform you that the bearer of this letter is **Salama Anyingisye Mwasambili** with Reg. No. **HD/MUH/T.565/2022** is 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 will be doing an elective research titled: **"Evaluation of the Implementation of the Redesigned Logistics System: A Case of Healthcare Facilities and Medical Stores Department in Mwanza Region."**

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

Kindly provide her the necessary assistance to facilitate the conduct of her research.

We thank you for your cooperation.

Ms. Victoria Mwanilwa
For: DIRECTOR, POSTGRADUATE STUDIES

c.c **Salama Anyingisye Mwasambili**

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line:+255-22-2151378;Telefax:+255-22-2150465;E-mail:dpgs@muhas.ac.tz;Web:https://www.muhas.ac.tz

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote:
Ref. No. HD/MUH/T.565/2022 04TH June, 2024

The Director General,
Medical Stores Department,
P.O. Box 9081,
DAR ES SALAAM

Re: INTRODUCTION LETTER SALAMA ANYINGISYE MWASAMBILI

We would like to inform you that the bearer of this letter is **Salama Anyingisye Mwasambili** with Reg. No. **HD/MUH/T.565/2022** is 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 will be doing an elective research titled: **"Evaluation of the Implementation of the Redesigned Logistics System: A Case of Healthcare Facilities and Medical Stores Department in Mwanza Region."**

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

Kindly provide her the necessary assistance to facilitate the conduct of her research.

We thank you for your cooperation.

Ms. Victoria Mwaimwa
For: DIRECTOR, POSTGRADUATE STUDIES

c.c **Salama Anyingisye Mwasambili**

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam. Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line +255-22-2151378;Telefax:+255-22-2150466;E-mail:dpgs@muhas.ac.tz;Web https://www.muhas.ac.tz

UNITED REPUBLIC OFA TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL
MAGU DISTRICT COUNCIL

In reply please Quote:

Our Ref. No. MDC/S.10/86/VOL.II/14 26th June, 2024

Principal,
Muhimbili University of Health and Allied Science (MUHAs)
P.O. Box. 65001,
UPANGA – DAR ES SALAAM.

REF: PERMISSION TO CONDUCT RESEARCH AT
MAGU DISTRICT COUNCIL

Please refer to the heading above and your introductory letter from Regional Administratative Secretary to District Executive Director, a letter dated 14th June, 2024.

2. Following your introductory letter from Regional Administrative Sectretary requesting to give you necessary support to conduct your research titled "Evaluation of the Implementation of the Redesigned Logistics System with a case of Healthcare facilities and Medical Store Department in Magu District Council".

3. I have a pleasure to inform you that your request to conduct your research has been accepted.

4. Your required to report to my office for more directive.

5. Sincerely yours,

Marco M. Ndalahwa,
FOR: DISTRICT HEALTH, SOCIAL WELFARE AND
NUTRITION SERVICE DIVISION OFFICER
MAGU DISTRICT COUNCIL

FOR DISTRICT MEDICAL OFFICER
MAGU

Copy: Salama Anyingisye Masambili,
Muhimbili University of Health and Allied Science (MUHAs)
P.O. Box. 65001,
UPANGA – DAR ES SALAAM.

UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH

MEDICAL STORES DEPARTMENT

msd
medical stores department

In reply please quote:

Ref. No: EA.253/309/01B/18

June 12th, 2024

Director, Postgraduate studies,
Muhimbili University of Healthy and Allied Sciences,
9 United Nations Road, Upanga West,
P.O. Box 65001,
DAR ES SALAAM.

Re: **INTRODUCTION LETTER FOR MS. SALAMA A. MWASAMBILI WITH REG.NO: HD/MUH/T.565/2022**

Refer to your letter with Ref. No: HD/MUH/T.565/2022 dated 04th June, 2024 regarding the above subject.

2. Please be informed that, Medical Stores Department has accepted the request of Ms. Salama A. Mwasambili to conduct a study (Data Collection) in Mwanza Zone for five (5) days from 17th June, 2024 to 21st June, 2024.

3. However, she will be required to submit the report of her research to MSD after the study.

4. Kindly provide the student a copy of this letter for her action.

5. Kind Regards.

Hans A. Mwambuba
For: **DIRECTOR GENERAL**

Copy: ZM – Mwanza, Ms. Salama A. Mwasambili & Trainee file