THE EFFECT OF INVENTORY MANAGEMENT ON SERVICE DELIVERY IN PUBLIC HEALTH INSTITUTIONS
A CASE OF MULAGO NATIONAL REFERRAL HOSPITAL

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DEDICATION

This research is dedicated to those people in my life who have so skillfully encouraged, inspired and motived me. May the Good Lord abundantly bless you all.

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I am thankful to my supervisor, Mr. Magara Mugaga for his guidance and encouragement which enabled me to complete this research work. I also wish to thank my classmates who pursued the Bachelor of Science in Finance and Accounting Degree of Uganda Martyrs University at Rubaga Campus for their support in group discussions and sharing of academic information. My parents the Late Ssalongo Gerald Ssensuwa and Princess Immaculate Zalwango, my brothers and sisters deserve endless thanks for their encouragement, support that enabled me to achieve academic success. I also thank the Management and Staff of Mulago National Referral Hospital for providing the suitable environment that enabled me carry out my study.

I thank the Almighty God, for it is not because of my might that I have completed this study, it is because of His Power. May His Name be glorified forever!

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LIST OF ABBREVIATIONS

CVI	Content Validity Index
IM	Inventory Management
KCCA	Kampala Capital City Authority
MDGs	Millennium Development Goals
NMS	National Medical Stores
SPSS	Statistical Package for Social Scientists
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

ABSTRACT

The study investigated the effect of Inventory Management on service delivery in Public Health Institutions. Inventory management was examined basing on stock requisitioning, stock taking, and storage, while service delivery was looked at basing on availability, accessibility and timeliness of services offered. The study focused on these variables basing on Mulago Hospital. The study objectives were to; find out the effect of requisitioning, stock taking and storage on service delivery in public health institutions. The research adopted both quantitative and qualitative approach using survey and case study designs. Basically 250 respondents participated in the study. These included Administrators, head of departments/sections, Medical workers and other staff (non-Medical Workers) from different departments. Questionnaires and interview guides were used to collect data. Data was analyzed using the Statistical Package for Social Scientists where conclusions were drawn from tables, figures from the Package.

The findings revealed that stock requisitioning (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.703 (70.3%) whereas the remaining percentage is by other factors. Furthermore, there was a positive and significant relationship between stock requisitioning and service delivery denoted by R=0.839 (83.9%). It was also revealed that stocktaking (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.762 (76.2%) whereas the remaining percentage is by other factors. Furthermore, there was a positive and significant relationship between stocktaking and service delivery denoted by R=0.874 (87.4%). The indicated that stock storage (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.706 (70.6%) whereas the remaining percentage is by other factors. It was also found out that there is a positive and significant relationship between stock storage and service delivery denoted by R=0.841 (84.1%).

Recommendations of the study included need to strengthen requisitioning procedures in public hospitals, ensuring that there are more than one supplier of medicines and drugs to public health units, reviewing stock requisition plan, adapting computerization of requisitioning, stock taking and storage functions of the organization, and ensuring that there is regular and decentralized stock tacking and storage activities inn public health institutions.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

Inventory management is procedural techniques, a firm undertakes to procure, manage, handle and utilize its inventories (Kizito, 2012). One of the reasons for inventory management is to attain recommendable service delivery since inventory is a strong component that is kept in a production firm. Acquisition, control and management of inventory are very useful in any organization (Kizito, 2012). Inventory management (IM) is science of controlling and regulating the flow of inventory in the organization (Cannella, 2013). During inventory management, a procurement officer or a store's manager is tasked to check the net worth and value in inventory. Coulter and Shepherd (2015) noted that inventory management is a managerial function and different techniques are adopted to effect this, although the choice of technique (s) to be applied and its benefits varies from one organization to another in terms of productivity and service delivery.

The study focused on the effect of inventory management on service delivery in public health institutions. The independent variable was inventory management with dimensions such; stock requisition, stock taking and storage while service delivery was the dependent variable with dimensions such as; availability of services, timeliness in service delivery and accessibility to services in the health institutions. However PPDA regulations, government policies and budget allocations were the moderating variables. The chapter includes background to the study, statement of the problem, research objectives, research questions, scope of the study, significance of study, justification, definition of key terms and conceptual framework.

1.1 Background to the study

Globally, all firms should be implementing inventory management while using different techniques such as Just in time, ABC analysis, Drop shipping, Cross-docking and Bulk shipments. However, Segeuina (2011) notes that implementation of Inventory Management is fulfilled by 67.9 percent firms and ½ of these in developed economies. According to Wales (2015) countries like USA, UK, and India are referred to for medical attention due to improper inventory which avails drugs and medicines (Yang et al, 2016). Many firms in the USA, New Zealand, UK, and Singapore have prominently focused on inventory management as part of managerial controls. Practice less effectively practiced in Latin America and Sub-Saharan Africa (Perlitz, 2015). Inventory Management in the various firms/ sectors, is focused on ensuring continuous production, although its scope and effectiveness vary from one sector/area of service to the other.

In Africa, only large firms mind about inventory management and 7.3 percent adopt inventory management techniques effectively (Coulter and Shepherd, 2015). Inventory management in Africa has its background with the ancient Egyptian storage of food to meet the forecast famine in the Joseph times (Lang and Chowdhury, 2010). Inventory management is critical in the health sector in African countries (Wales, 2015). While different hospitals in Africa under their management have an inventory supplies and management policy, about 67.1% still fail to render credible services due to shortages or stock-outs. The challenge is experienced in many countries including Somalia, Kenya and Zimbabwe. While some countries such as Egypt, Nigeria, Botswana and South Africa, have made progress in health service delivery the quality and scope of inventory management in Sub-Saharan Africa remain poor, and has far-reaching effects on service delivery especially in health (Msimangira, 2014)..

In Uganda, except for manufacturing firms inventory management is rarely practiced (Kizito, 2012). Rujumba (2014) also revealed that only prominent firms such as Mukwano, Britannia, Beverage firms and Breweries consider inventory management as important. On the contrary, the public sector depends on national supplies and operates on a defined plan of inventory management. In the health sector, all Public Health Institutions get their supplies from National Medical Stores annually, and at time of emergency/outbreak (Ministry of Health, 2016). Service delivery in health service centers/hospitals is dependent on the supplies received and the composition of inventories in the supplies kit (Kato, 2014). This exposes some patients to go without being served due to shortages, stock outs and has increased referral cases.

Mulago is Uganda's largest and oldest national referral hospital, but to date there are incidents of complaints of drug shortage and excessive referral cases to private hospitals in Uganda, and other countries such as India, UK and USA partners. Ordinary health services are also not easy to obtain due to huge numbers of patients, inadequate space, and shortage of drugs at Mulago Hospital (Rujumba, 2014). Due to these service delivery constraints, the government has rehabilitated other KCCA hospitals in Kampala to help de-congest and ensure better services at Mulago Hospital (Mulago Hospital Annual report, 2016). In spite of these efforts and regular suppliers by National Medical Stores (NMS), persistent shortages complaints in service delivery still prevail and are reported at Mulago Hospital (Omaswa et al., 2011). Mulago has a procurement section tasked with undertaking inventory acquisition, stock tracking and storage as part of its inventory management function, but shortfalls still exist in service delivery. No recent study had been conducted to provide information on inventory management and service delivery in health institutions and particularly on Mulago National Referral Hospital.

1.2 Statement of the problem

Health remains a fundamental right for all human beings, and health service delivery is a national issue (Msimangira, 2014). As a matter of national importance, all countries provide public health services through private and Public Health Centers. Provision of health services in public health institutions and particularly Mulago Hospital has been highly associated with shortage of drugs, and there are increased cases costly referrals to other countries (Tumwine et al., 2010). In spite of getting supplies from National Medical Stores and well-defined structure of procuring and sourcing for inventories, Mulago's challenge of shortages, stock-outs and declining service delivery quality remain. Over 67 of the 100 patients received at Mulago with special cases/sicknesses are referred to buy drugs from private practitioners outside the hospital premises (Tumwesigye, 2016). If this is not attended to, the goodwill and trust of the public in the service delivery of Mulago and other public health institutions may go down. Owing to this background, this study was interested in examining the effect of inventory management on availability of essential drugs with reference to Mulago National Referral Hospital.

1.3 Objectives of the study

1.3.1 General Objective

The study assessed the effect of Inventory Management on service delivery in Public Health Institutions.

1.3.2 Specific Objectives

I. To find out the effect of requisitioning on service delivery in Public Health Institutions.
II. To establish the effect of stock taking on service delivery in Public Health Institutions.
III. To assess the effect of storage on service delivery in Public Health Institutions.

1.4 Research Questions

1. What is the effect of requisitioning on service delivery in public health institutions?
2. What is the effect of stock taking on service delivery in public health institutions?
3. What is the effect of storage on service delivery in public health institutions?

1.5 Scope of the Study

1.5.1 Geographical Scope

The study concentrated on Inventory Management and Service delivery at Mulago Hospital. Mulago Hospital is located in Kawempe Division, Kampala city. The researcher focused on Mulago Hospital because it is the biggest referral center, which has been closely associated with shortage of drugs, and poor quality services in the last few years. This made Mulago Hospital a potential source of information about this study.

1.5.2 Content Scope

The study concentrated on inventory management and service delivery in public health institutions in Uganda. Focus was on the effect of stock requisitioning on service delivery in public health institutions and also effect of stock taking on service delivery in public health institutions. The effect of storage on service delivery in public health institutions was also examined.

1.5.3 Time Scope

The study concentrated on Inventory Management and Service delivery at Mulago Hospital from 2014 to 2017. This duration of three years was selected owing to the available time and financial resources for the study.

1.6 Significance of the study

The study is useful in providing the management and staff of Mulago hospital information about the relevant and up to date procedures in procurement and handling inventories in its services.

The study provides to the Medical superintendent and staff of different public health institutions, information about the ways of acquiring stock, stock tacking, storage and handling of inventories. This can be resourceful in improving service delivery in public health centers.

Findings generated from this study are useful to the health sector in general (including private health service providers) about procurement and stock management in order to reduce the stock outs in their health facilities. This helps in identifying and making suggestions on how to minimize poor health service delivery in Uganda.

The study provides a deeper and detailed understanding of the concepts of Inventory Management and service delivery as they are expounded in this study. This is useful in providing up to date literature regarding these concepts, for future research.

Findings of this study may provide relevant data to Ministry of Health and other government officials' information about the performance of the health sector. This can be useful in policy making, planning, decision making and other ministerial frameworks that relate with inventory management and service delivery.

The study is of great value to the researcher as it enhances her understanding of the Inventory Management and Service delivery. This can be useful to her in future research, career and putting to task officials in public sector to offer desired and recommendable services to the people.

1.7 Justification of the study

Service delivery in health services in Uganda has been associated with complaints for that last ten or more years especially in the public sector (Kavuma, 2009). This has persistently re-existed especially in referral hospitals including Mulago National Referral Hospital. Referrals of services to private health centers by Mulago Hospital especially for some medicines out of stock continue despite being a national health center.

It was not yet clear whether the hospital is doing the right inventory management practices in terms of requesting for the required and most demanded drugs/medicines, stock taking and storage. The status of service delivery remained poor despite efforts of NMS to supply Mulago Hospital more inventories of drugs, disposables and consumables even beyond schedules. If this persists, the value people attach to public health institutions will continue to deteriorate. And no detailed study had been conducted to provide information on how inventory management affects service delivery in public health institutions. Therefore, it was not well explained why there was poor service delivery at Mulago Hospital, and this could be related with the hospitals' inventory management, though no detailed study had been conducted to expounded on this aspect.

1.8 Definition of Key Terms

Inventory: the amount of goods, materials or parts carried out in stock or store house for example, work in progress, raw materials, financial goods resale maintenance, repair and operations (MRO) items.

Inventory management: involves the planning, ordering and scheduling of the materials used in the manufacturing process. It exercises control over three types of inventories i.e. raw materials, work in progress, and finished goods. Purchasing is primary concerned with control over the raw

materials inventory, which includes; raw materials or semi-processed materials, fabricated parts and MRO items (maintenance, repair and operations).

Service delivery: a component of business that defines the interactions between providers and clients where the provider offers a service whether that be information or a task and the client either finds value or loses value as a result.

Stock taking: the process or activity of making regular records of what stock is received, utilized and kept by the organization

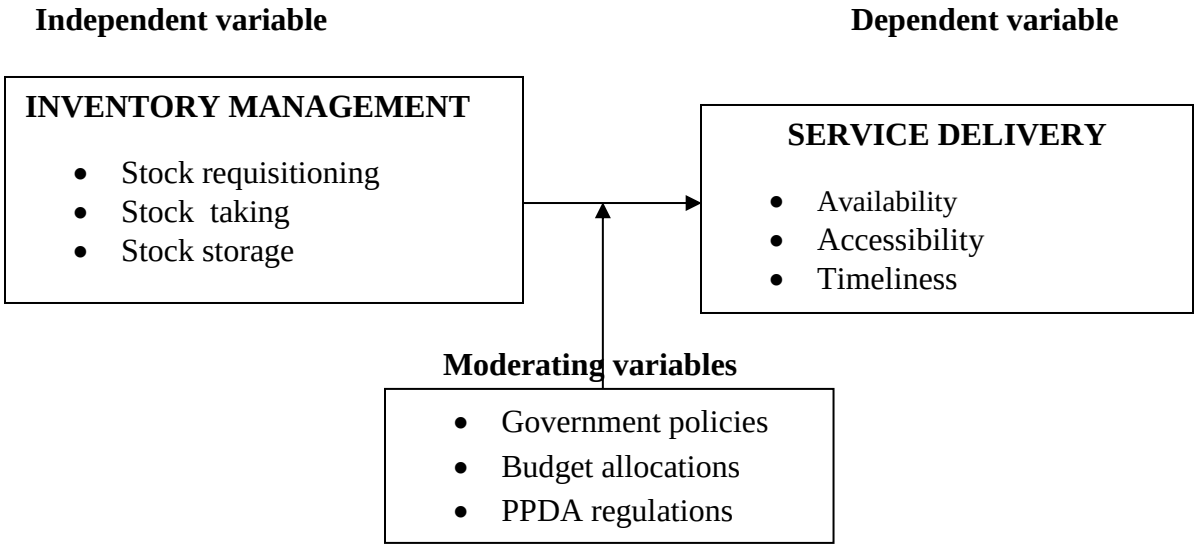
Stock requisitions: the process by which stock controllers make a summary list of what items, stocks needed by the organization.

Stock storage: the activity/process of committing different items, stocks and consumables to stores for safety, protection and security while they await allocation to user departments.

1.9. Conceptual framework

The conceptual framework shows the effect of inventory management on service delivery. The illustration showed that inventory management was an independent variable and service delivery was the dependent variables while procurement policies, budget allocations and PPDA regulations had a moderating effect on inventory management and service delivery.

Figure 1: Conceptual framework



Source: Adopted from Christensen, (2007) and modified by the researcher 2017

As shown in figure 1.1, inventory management was an independent variable while service delivery was the dependent variable. Inventory management was measured by examining the stock requisitions, stock taking and stock storage aspects while service delivery was measured basing on the quantity of services delivered, availability, accessibility and timeliness of services provided. Health service delivery can also be influenced by PPDA regulations, budget allocations, staff / management competencies, and government policy. These factors exist as moderating factors and were considered as constant in this study.

Inventory management is a key ingredient in service sector. Service provider largely depends on the type, quality, availability and nature of different inventories in order to provide a reliable and dependable service (Mahlakoleng, 2012). All inventories need to be planned or and managed right from requisition, acquisition, regular stock tacking and storage and accountability. The function of inventory management is applicable in many sectors including service delivery (Christensen, 2007). Service delivery can be observed regarding the extent by which beneficiaries are able to access, timely, quality and desired services.

1.10 Conclusion

This chapter highlights the introductory section of this study and gives a background regarding the variables under study. The chapter also presents statement of the problem which highlights area of inquiry regarding service delivery and inventory management in health services. It further pointed out the research objectives, research questions, scope and significance of the study. In this chapter the researcher presented the justification for conducting the study, defines key terms used and also presents the conceptual framework to be followed in conducting this study. The chapter paved way for further review of literature about the variables, as presented in the next chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presented the review of literature about the study. The reviewed information was on the study objectives. The effect of requisitioning on service delivery in public health institutions, effect of stock taking on service delivery in public health institutions and effect of storage on service delivery in public health institutions have been reviewed.

2.1 Overview of the variables

2.1.1 Overview of Inventory Management

Inventory management plays a crucial role in enhancing effectiveness and efficiency in handling inventory of firms (Chand, 2012). Companies have been continually in search for sources of sustainable competitive advantage in their operations. Hence, there is need for organizations to embrace effective inventory management practices in order to improve their competitiveness (Yang et al., 2016). Inventory management leading to inventory reduction has become the primary target, as is often the case in just-in-time (JIT) systems, where raw materials and parts are purchased or produced just in time to be used at each stage of the production process. This approach of inventory management brings considerable cost savings from reduced inventory levels (Johnson and Kaplan, 2015).

However, large buffer inventories consume valuable resources and generate hidden costs (Salawati, et al, 2012). Too much inventory consumes physical space, creates a financial burden, and increases the possibility of damage, spoilage and loss (Nyabwanga et al, 2012). On the other hand, too little inventory often disrupts business operations (Dimitrios, 2008). Zipkin (2010)

affirm that today, the cost of holding inventory, extensive product proliferation and the risk of obsolescence, especially in rapidly changing markets, make the expense of holding large inventories of finished goods excessive and that high demand items naturally have safety stock assigned to them, but in many organizations there are so many very-low-demand items that keeping any stock of these items is unreasonably expensive. This implies that companies must now provide good service while maintaining minimal inventories.

The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting (Jorgenson, 2014). Organizations are facing competition in the current markets which has led to the need for designing better methods of managing and measuring how resources are utilized by various jobs or products, and therefore eliminate any wastage in the supply chain (Ramjee, 2011). Consequently, many companies have to adopt appropriate inventory management system which reduce inventory levels and improve operational performance.

Chen et al, (2005) observed that the firms with abnormally high inventories have abnormally poor stock performance and firms with lower than average inventories perform best over time. Organizations hold inventory to ensure operational activities proceed uninterrupted. However, organizations at times face the problems of fluctuating inventories, inaccurate forecasts, low utilization due to inadequate coordination of business operations leading to significant losses and wastage in the supply chain (Brent and Tokar, 2013). To excel in competitive environment, organizations have to design and operate materials management and product distribution

functions effectively through integration of traditional logistics decisions with inventory management decisions using traditional control models

2.1.2 Overview of service delivery

Service delivery is a joint activity, and it may be complex to define service delivery without focusing on the stakes involved (Anwar, 2015). In the same view, Anwar (2015) reveals that health services, their provision and access are not only vital but a fundamental right (WHO, 2016). Health care is one of the public services offered, although it can also be provided private firms. Globally, 57.1% of the health sector services are provided by the state, and 42.9% provided by private practitioners (WHO, 2016). This makes provision of health services, a partnership between government, NGOs and private clinics.

Health services are provided and desired at all times, and it is not easier to plan for, since some health demands can be epidemic and others arise as an outbreak. Nearly 67.2% of the health services globally remain under or undelivered in developing economies (World Bank, 2015). Health services include in-patient, out-patient, admission and emergency services. These vary from one client to another depending on ailment (Andrews & Anwar, 2012). Service delivery in health sector tends to vary from one country to another, in terms of quality, effectiveness, coverage, availability and timeliness.

According to Huther & Shah (2014) developed an index rating the extent to which people were getting desired health services globally. Huther & Shah point out that health services availability varied from one country to another, and in UK, 89.1% of the health services desired were available, 84.9% for USA, 80% for Europe especially in Spain, Norway, and about 76.9 percent for Middle East countries especially India, China, Japan and Republic of South Korea. African

however lags behind at about 43.9% (Huther & Shah, 2014). Strengthening service delivery is crucial in achievement of Millennium Development Goals (MDGs). This makes health services availability crucial as well (World Health Report, WHR. 2015). According to WHR, 2015 and Anwar (2015) availability is of not only drugs, but the human resources material resources.

Service delivery in the health sector is immediate and at times an emergency circumstance. They should be as accessible as possible. Quality access to health services in an organizational setting is ability for the client or beneficiary to health products to get and utilize these products/services as and when he/she wills (Baily, Jessop & Morison 2014). Baily et al., (2014) further pointed out those services are directly and permanently accessible with no undue barriers of cost, language, culture, or geography. Accessibility means that health services are close to the people, with a routine point of entry to the service network at primary care level (not at the specialist or hospital level (Boyd, 2015).

Tumwine et al., (2010) noted that the challenge in the health sector in Uganda is inaccessibility to the few public health centers in place, and inaccessibility to specialized services as may be desired. Due to inaccessibility to health services, even the existing health services may be provided when it is too late to save life and this several times is blamed on the distribution of the health centers countrywide. Delayed health intervention especially in critical conditions and emergency cases remain one of the causes of deaths especially in developing economies (WHR, 2015). Additionally, Gayle & Pimhaidzai (2013) stressed that timely health services are key and vital for successful health attention in the short and long run times of health services.

Wales (2015) noted that coupled with the existence of different facilities, the time per patient is essential, just as the doctor- patient ratio (DPR) is critical. All this is essential for a better and

cordial health service provision to the public. Rujumba (2014) explained that it has remained a challenge for most health practitioners to effectively deliver their services as and when they ought to. The facilities, stocks of drugs in place a well as manpower as compared to the patients has kept this a routine challenge in most health centers. For this study, focus was on how health services are delivered in public health institutions with reference to availability, accessibility and timeliness of health services in this sector. Particular attention was on health service delivery as provided at Mulago National Referral Hospital.

2.2 Review according to study objectives

2.2.1 Stock requisitioning and Service delivery

Inventories and materials stocks are subject to continuous use and as such keep changing–arising from out of using these stocks. According to Zipkin (2010), stock requisitions are a series of activities undertaken by the organization to acquire necessary stocks of different types for the organization. Reflecting on the public sector, Jorgenson (2014), revealed that stock requisition involves a number of activities right from placing for new suppliers, orders, and provide useful accounting information that is used to obtain the required inventory in the organization. Ramjee (2011) stressed that stock requisition is reflected to start the inventory management cycle, and is the beginning point of inventory handling. This implies that requisition of inventories in the firm is to ensure that inventory requisition takes the right procedure and provide for the supplies of essential and non-essential inventories at a given time of inventory acquisition.

According to Ramjee (2011) stock requisition involves, establishing proper purchase procedures and in the public setting specifications of need and scheduling quotations, placing demand orders, and specification of inventories required. Brent and Tokar (2013) noted that inventory

requisition level gives attention to inventory types on whether the inventory is slow moving, dominant, obsolete, fast moving, special and essential supplies and also consumables. Procurement officer in collaboration with the accounting officer determines which inventory type is required, and by which quantities. This implies that stock requisition involves a number of activities right from placing for new suppliers up to the time when old stocks are nearing replenishment by the organization.

Yang et al (2016) assert that stock levels are a fast moving ingredient in an organization especially where supplies as a core input for service delivery. Health services are exclusively provided basing on the supplies of drugs, consumables and disposables (Cannella, 2013). The inventory of these inputs define what services are provided at a particular health unit, when there is demand and staff to administer the service (Yang et al., 2016). Rujumba (2014) remarked that despite existence of nationally recognized procedures, such as National Procurement Guidelines, Procurement and Disposal Act, and Operational procedures of NMS in allocating to User Hospitals, it is common practice to find each hospital having an Inventory Management and allocation plan/schedule which is followed. This means that requisition begins with requisitions, when requisitions are prepared in time, delivered in time and are comprehensively prepared in reference to the need of supplies.

According to Weele (2015), requisition is the process of outlining and putting to print the forecasted quantities of stocks needed by the organization. The department responsible for stocks and inventory management should be on the basis of the previous performance and usage, as well as demands for new supplies, prepares a requisition for new inventories. The time and process vary from one firm to another depending on whether the firm is using ABC technique, Just-In-Time, or any other technique (Medecins Sans Frontieres -MSF, 2015). The scope,

frequency and regularity of requisition making and how they are honored are Key in a number of areas including service delivery (Caldwell, et al., 2014). This implies that the status of the procurement activities as well as the quality of service delivery closely relate with the supplies that were supplied by order.

Shortages may arise because the particular items were not necessarily requested for at the time of making requisition (Weele, 2015). Msimangira, (2014) affirmed that proper requisition of supplies when done in the right time, place, quantity and by the right person helps to cut shortages to zero or tolerable levels. Weele (2015) stressed that the key issues in the public procurement of health services are transparency, quality of access and robust logistics flow in service centers, as well as accountability and effective service delivery. Nearly 87% of the health units depend on supplies that are presented at the time of making requisitions. This means that the head of the health institution presents requisition early enough before stock-run out and management of the requisition process has to accounts for 90% of the factors that determine the availability of required drugs and user facilities, and subsequently service delivery.

Msimangira (2014) while emphasizing the value of a comprehensive procurement process in public entities reveals that it all begins with the requisition step. A well drafted and presented requisition is Key in ensuring that the services desired are met. It allows for accessibility level of the necessities, essential and regular drugs, facilities, disposables and consumables in the hospital. Public acquisitions are guided by a number of policy and procedural guidelines that shape the transactional manner in which the activities are done, but one of these is recommendable format of requisitions (Hau and Joe, 2013). Procedural and routine operations based on a well followed requisition procedure is key in ensuring that the firm is able to offer not only quality but timely and desirable services (Dimitrios and Koumanakos, 2015).

2.2.2 Stock-taking and service delivery

Wanke (2013) reveals that stock taking are activities that are undertaken to keep record of stock that has been acquired, is allocated to different user departments, and other particulars that relate to the inventory being held at the organization. Stock taking some times considered as inventory checking is the physical verification of the quantities and condition of items held in an inventory/ organization (Ramjee, 2011). Stock taking is a precautionary measure regarding stock utilization/allocation levels in order to avoid discrepancies and shortages beforehand (Sako, 2012). This implies that stock taking under inventory management is critical.

Stock-taking is an intensive annual, end of fiscal year, procedure or may be done continuously by means of a cycle count (Coulter and Shepherd, 2005). As an inventory manager, efforts should be directed towards ensuring that there are preventive measures to eliminate theft, losses, wastage and misuse (Hsieh, 2002) and also ensure that there is efficient, effective, economic and transparent use of the inventory delivered to the entity (Lin and Yao, 2014). This means that stock taking is a record of what transpires regarding the stock flow and usage, and as such is a fundamental practice in the general inventory management practices.

Jorgenson (2014) revealed that a sound inventory control system secures the best balance between “too much and too little”. Too much inventory carries financial rises and too little reacts adversely on continuity of productions and competitive dynamics hence credible stock taking is not only essential but a lasting solution for having optimum stock levels as and when it is desired (Wales, 2015). Msimangira (2014) assert that stock taking is a non-avoidable aspect not only in stores management but entire procurement activities. This implies that stock taking involves

series of activities that are undertaken to ascertain the quantity of items by category that are held by the organizations stores.

Farney and Gupta (2013) revealed that while it is not done as recommended, stock taking is one of the most carried out activities in organizations. However, only 34.9% of entities do stock take and keep related records as recommended in many departments in the health sector in Uganda (Kato, 2014). Dimitrios and Koumanakos (2015) stressed that stock taking is a regular and routine activity especially where the stock flow is a daily activity. Stocks/inputs and out puts are recorded as they exist in various departments, and user points (Deming and Kruger, 2014). This means that stock taking involves identifying most regular supplies, classifying them by code and names, and taking records of inputs, damages, expired inventories and output used.

Farney and Gupta (2013) noted that stock taking is an ingredient activity for accountability and controlling the misappropriation of resources/materials as they exist in the organization. Proper stock tacking is fundamental tool for counter checking and ensuring that the right stock is held as required for current and immediate use (Rujumba, 2014). Proper stock taking ensures that the firm remains with up-to-date records of stock which hinders staff from using some of the stocks for personal motives and benefits. This implies that where stock taking is faulty or not well done, the services are jeopardized with shortages arising from misuse of some stocks of materials.

MoH, (2009) emphasized that for each lot of public procurement done for a health unit, all the facilities, drugs and other requirements are dispatched in relation to the level of the health center facility and holding capacity and the paper work done. The ‘paper work’ is mainly considered as the stock taking record. Records of stock held, type and at what point in the procurement-user network, are key in determining the extent to which services desired are provided in the

organization. Hau and Joe (2013) affirm that stock tacking is very useful in overseeing the flow of inventory in the business and as such determines the production, services rendered and objectives not achieved. This means that through proper stock tacking, the inventory manager is able to oversee and regulate the constant flow of units into and out of an existing inventory.

According to Caldwell et al., (2014), stock taking process usually involves controlling the transfer in of units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. In the health sector, the procurement officers need to keep close look to records so as not to run out of the stocks for the essential and hard to secure drugs, and other supplies (Dimitrios and Koumanakos, 2015). Falkenberg and Tomson (2010) stressed that stock taking is cross check for effectiveness, timelines and quality service especially when stocks are kept on and above re-order levels. This implies that Stock taking give a true record of what is acquired, used and balance.

Stock taking can hence be used to determine the improvement levels of service to the beneficiaries, as expected. Weele (2015) later added the firms having regular and frequent stock taking of its inputs, save costs, is able to attain timely services as they are demanded and is paramount in providing its clients and suppliers access to desired services (Muyingo et al., 2012). The review of literature presented gives scholarly views regarding stock taking as part of the inventory management function, and links it to the scope service delivery. It is however not exclusive when examined in relation to the health institutions, and this attracted the attention of the researcher in establishing information regarding stock taking and service delivery in public health institutions in Uganda.

2.2.3 Stock Storage and service delivery

Stock storage is not only a requirement but a fundamental obligation of financial manager and stores controller. Jorgenson (2014) stressed that storage management is also considered as a means adopted by the organization to maintain sufficient stocks of raw material in period of short supply and anticipate price changes. Brent and Tokar (2013) noted that stock storage can be done through block staking, storage on racks, storage in specialized refrigerators depending on the fragile nature of the items under storage, as well as use of shelves and cabins. This means that stock storage and management requires having the right storage facility which can protect, preserve and facilitate planning and service delivery.

Yang et al (2016) maintain that storage can also be considered in terms of decentralized or centralized system, or having a point-of-use (POU) system. In whichever dimension or system used, stock storage is critical and play a significant role in inventory management. Sako (2012) noted that inventory control is concerned with the acquisition, storage, handling and use of inventories so as to ensure the availability of inventory whenever needed, providing adequate provision for contingencies, deriving maximum economy and minimizing wastage and losses. This means that the variance in storage of inventory can arise depending on the type of item being stored or specialty of the facilities in place and the delicacy of the items being held as inventory in the institution.

In the course of undertaking stock storage, the firm can use dry storage or wet storage as noted in the text of Jaber (2009). Jaber (2009) adds that dry storage relies on your staff properly labeling and securing shelves and bins. Dry storage is good for consumables that are less dangerous on exposure such as cutlery, facilities and equipment, and also for less fragile items (Ouyang, 2011). Wet storage is where items are stored in refrigerators, sometimes in preservative

liquids. This implies that the storage of health item, drugs, consumables, and other disposables can be done by using one of these approaches, at the health unit, and this study focused on examining which of these approaches are used in stock storage at Mulago Referral Hospital.

Gupta (2011) noted that storage is an all-round organizational activity that ensures effective running of the organization at various sectors of the organization. Farney et al., (2004) noted that effective stores is a target for at least all organizations especially those dealing with handling of supplies, batch manufacturing, logistics inflow and out flow operations. Hepler and Strand (2010) affirm that storage is a key aspect in inventory management. Each organization provides a key framework that defines it storage function. Different stores owned and run by each and every organization. This means that the quality and level of service depends and emerges rightly from what is within stores.

According to Dwyer & Christopher (2010) the achievement of quality service has a close link with the level of effectiveness in stores management. The storage function which involves looking at the materials stored the level of demand and supply of the items stored the effectiveness of the personnel in terms of skill, proficiency and timely performance as well as design and layout of the store facility. The nature, facilities and equipment used in the stores determines the quantity, level of effectiveness and the availability of different items in the stores. Muyingo et al., (2012) noted that storage arranges and prepares for transportation of supplies until they are received at the stores. There is need for transportation procedures that can ensure that each user unit is able to access and have the allocated quantities as and when they are due (Wales, 2015). This means that the supplements the unit which is commonly occupied by professional health workers and physicians who exclusively need essential drugs for their specialized hospital service delivery.

According to Boyd (2011), storage defines what is done to protect, handle and manage supplies to the firm in the current and future generations. Stores function and its management are an integral part of the procurement function that should be carefully examined and strengthened if the hospitals can effectively attain, maintain and a have a steady supply and volume of essential medicines. Bhatia (2013) stresses that record keeping is a practice that has been in place for a long time and cuts through different sections and departments being done in accordance with the area of practice and profession. Therefore storage is of great importance in improving the planning, operations and utilization of materials for better service delivery.

According to Thanabalan (2011), there have to be sequential considerations of having the right stores records keeping for purposes of stock taking, valuation, costing and service delivery. Firms with up-to-date stores management system where record keeping are well institutionalized, have minimal erroneous figures on declining volumes in their stores. Wales (2015) reveals that proper storage provides for information on the status in terms of volume of rare and special case items such as essential medicines before they run out of stock. Storage as a function of inventory management helps the firm to attain its reliability and successful achievement in the service delivery (Migiro & Ambe, 2008). This means that the firm is able to determine what is allocated to various user departments and what makes up the inventory flow. Hospital can handle the different cases of patients depends on its storage and what is being stored at present and future times.

2.3 Conclusion

Inventory management is one of the key functions in management, procurement, accounting and other key decision–making functions of an organization. Inventory management is invaluable in ensuring effective health service delivery, but the scope and level of service delivery in health

services in Uganda is far from the expected one. The review has presented literature regarding inventory management aspects of stock requisitioning, stock taking and storage and service delivery. However, the literature is not exhaustive in itself and there are a number of gaps that should be examined. This attracted attention of conducting the study, by adopting the methodology presented in the next chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter explains the approaches the researcher used to collect information to address the research problem in this study. It includes the research design, area of study, and study population. The sampling procedure that is the sample size and sampling techniques, methods and instruments of data collection, quality control methods, data management and processing, data analysis, ethical considerations and limitations of the study are also presented in this chapter.

3.1 Research design

This study used a case study research design involving both quantitative and qualitative approaches. According to Kombo & Tromp (2010), a case study is a design that seeks to describe the variables under study in detail and holistically. This design was selected because to the belief of the researcher it was convenient in establishing in detail the effect of inventory management on service delivery in public health institutions. For purposes of getting detailed statistical and descriptive data, the study focused on using both qualitative and quantitative approaches of data collection and analysis. The choice of these approaches and design helped in obtaining comprehensive information about the study.

3.2 Area of the Study

The study was carried out at Mulago hospital on a hill in north-central Kampala, the Capital City of Uganda. Mulago hospital is located on Mulago hill is located in Kawempe Division, one of the five (5) Administrative Divisions of Kampala. Built in 1917, Old Mulago Hospital merged

with the New Mulago Hospital in 1960 to form Mulago National Referral Hospital. The hospital offer health services at an international level for outpatient visits, inpatients, 8 emergencies, ANC, deliveries and postnatal services, laboratory testing for various human diseases, X-rays, ultrasound scans, immunization, minor and major surgeries, among others.

3.3 Study Population

A population is a group of individuals, objects or items that have something in common whom the researcher had interest in the course of conducting a study (Kombo & Tromp, 2010). In this study, management and staff of Mulago Hospital was the population. Mulago hospital has 17 Top Administrators, 45 Heads of Departments/Sections, 696 non health/medical workers staff and 242 health workers (Mulago Referral Hospital Annual Report, 2016). In total, 1,000 people constituting the management and staff of Mulago Hospital were considered for this study

3.4 Sample Size and Selection

A sample size of 278 respondents was selected from a population of 1000 (basing on Krejcie & Morgan, 1970). These included Administrators, head of departments/sections, Medical workers and other staff (non-Medical Workers) from different departments. These were considered as representative of the entire population attracting detailed views about the study.

3.5 Sampling techniques

Sampling techniques are approaches that were used to select the respondents from the population (Tromp & Kombo, 2010). In this study, stratified random and purposive sampling techniques were selected. Administrators and Heads of Departments/sections were purposively selected. Purposive sampling was used because these categories are directly responsible for inventory requisition, stocking and storage practices, whose information was needed for this study. In

addition, the medical workers and non-medical workers were selected using simple random sampling. Stratified Random was used to provide a chance to all medical and non-medical staff to participate in the study basing on the sections under which they serve. Medical and Non-medical staff was stratified according to their area of specialization. A list of Medical and Non-medical workers was obtained from heads of sections, and different participants selected randomly from each of these lists. The approach used ensured the representation of all categories of workers, and provided an equal opportunity to all employees who participated in the study.

3.6 Data Collection Methods and Instruments

3.6.1 Questionnaires

Data was collected using questionnaires covering all the aspects on the objectives. A questionnaire is a list of questions/statements to be completed by the respondents (Mbabazi, 2011). Questionnaires consisted of close ended-questions to guide the respondents of expected responses. All categories of respondents were given questionnaires to save time since they were busy most of the time. Questionnaires consisted of sections. Section A had questions on demographic characteristics, Section B had questions on the effect of requisitioning on service delivery in public health institutions, section C had questions on the effect of stock taking on service delivery in public health institutions and Section D, had questions on the effect of storage on service delivery in public health institutions. Questionnaires considered the right method to use because, they were easy to fill, provided a wide response rate and guaranteed a high level of confidentiality.

3.6.2 Interview guides

Interviews were held with the staff in the records and procurement section of the various institutes that make up Mulago Hospital. These were contacted through interview guides. Interview guides consisted of simple, structured questions formulated basing on the objectives were used. Interviews were held at the offices of the selected officials and took duration of about 45 minutes. The use of interviews is relevant because it helped to complement the views obtained from questionnaires and provided detailed data about the aspects of inventory management and service delivery in their departments.

3.7 Quality Control Methods

Quality was ensured by ascertaining the Validity and Reliability of Research Tools

3.7.1 Validity

Face and content validity was ascertained. For face validity the instruments were reviewed by the supervisor and peers who made comments on the tools. After making the comments the researcher adjusted the tools appropriately deleting irrelevant questions and adding in some more deemed relevant. To attain content validity, a content validity index was calculated. Validity was tested through calculating of the Content Validity Index (CVI) using the formula;

$$CVI = \frac{\text{Number of items rated relevant}}{\text{Total number of items}}$$

CVI=29/32 = 0.90.

The instruments are considered valid after yielding a CVI above 0.7 as recommended (Mugenda & Mugenda, 2005).

3.7.2 Reliability

The researcher also ensured that the instruments being used were reliable. Reliability of the tools was ascertained through a pretest exercise. Pre-testing of tools was done at Naguru Hospital and only 10 respondents were selected from the identified categories of hospital administrators for the study. Pre-tested questionnaires were used to re-draft new questionnaires basing on the rating of the pre-test answers. Final adjustments were done in relation to the study objectives and the final amended research instruments were studied by the researcher under the guidance of the supervisor. These were considered to ascertain how best the tools were able to collect reliable information for the study.

3.8 Data Management and Analysis

A letter of authorization from Uganda Martyrs University was provided as a request for permission to conduct the study to the researcher. This was presented to the medical superintendent–Mulago Hospital. A cover notice from Medical Superintendent was attached by copy to each questionnaire explaining the purpose of the study and asking members of the hospital staff to respond to the study. Questionnaires were distributed directly to the respondents in their respective areas/offices for filling and were collected after two week following its dispatch and filling. The data collected was edited and decisions made on whether to use it or not. Selected and coded data was interpreted, analyzed and presented in a written report.

Data collected was coded, edited and tabulated. The study findings were coded into numerical and text information. This was done in relation to the research questions and responses obtained from the study. Collected data was edited and summarized using excel package from which tables, figures, and other percentages were generated. These were subjected to descriptive and

inferential statistics for analysis. Data was entered into Statistical Package for Social Scientists (SPSS) which helped to calculate the means, standard deviation, and regression analysis to generate statistics that was based on to make conclusions and recommendations about the study.

3.9 Limitations of the study

The researcher encountered time constraints in gathering data due to a big sample size. This was however solved by using the research assistants who were helpful in collecting data from the different respondents.

Some respondents were a bit hesitant in providing information for this study. This was however overcome by giving assurances about their confidentiality and emphasizing that the study was solely for academic purposes.

3.10 Ethical Considerations

The researcher asked for a letter of introduction from the research coordinator of Uganda Martyrs University Nkozi which introduced her to the respondents.

The researcher formerly asked approval of the top administration of Mulago hospital before conducting the study at the organization.

The researcher asked for consent from all the selected respondents before involving them in the study.

The researcher ensured that information collected was used only for the study purpose and treated with a lot of confidentiality.

3.11 Conclusion

This chapter has given a detailed description of the methods that were used to conduct this study. It provides the design to be adopted, and given an explanation about the study area, population and sample to be involve. The chapter further gives an outlook on which tools were used, method of analysis, and the way of managing and presenting the results as well as providing the ethical background that have been set as a consideration aspects for this study. In sum up, the chapter gives an approach and method by which this study was carried out to yield its results. The next chapter presented the findings to this study.

CHAPTER FOUR

DATA PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents the output of the data established during the study. It is a presentation of the results in form of tables, graphs and statements done in accordance with the study objectives. Findings are presented quantitatively and qualitatively as noted below.

4.1 Quantitative data presentation and discussion

The study first established the bio-data information of respondents as presented below.

4.1.1 Response rate

A total of 278 respondents was selected for the study, however only 250 fully participated. This provided the study response rate of 250 participants, 90% of the targeted respondents. This study response was considered applicable since it was high and distributed among the selected categories of respondents.

4.1.2 Position held by respondents

The study involved respondents occupying various positions in management at Mulago Hospital, and details is presented in Table 4.1 below.

Table 4.1: Positions held by respondents

Position held	Frequency	Percent
Administrator	2	0.8
Head of a section	6	2.4
Non-medical staff	178	71.2
Head of department	4	1.6
Medical Staff	60	24.0

Total	**250**	**100.0**

Source: Primary Data, 2017

Table 4.1 above shows that 71.2% of the respondents were non-medical staff working in various sections of the hospital, while 24% were medical staff, 2.4% represented head of sections, 1.6% were head of departments and only0.8% were administrators. This implies that all categories of respondents based on their roles and positions participated. Nonetheless, the non-medical staff dominated because of their largest number among the employees of the hospital.

4.1.2. Distribution of the respondents by Departments

In order to capture data from all departments, respondents were selected from various departments. Details of the distribution of participants according to the departments were as in Table 4.2 below.

Table 4.2: Distribution of respondents by departments

Departments	Frequency	Percent
Procurement	36	14.4
Mortuary	5	2.0
Records	51	20.4
General Administration	16	6.4
Maternity	30	12.0
Causality	41	16.4
Heart Institute	20	8.0
Cancer Institute	25	10.0
General Out Patient	26	10.4
Total	**250**	**100.0**

Source: Primary Data, 2017

Results in Table 4.2 shows that majority (20.4%) were employees in the records department followed by 16.4% from the casualty and emergency section, 14.4% were from procurement and 12% from the maternity. Other respondents, 10.4% were employees serving in the general outpatient (OPD), while 10% were from the cancer institute, 8% from the heart institute, 6.4% from general top administration and only 2% were from the mortuary section. From the above description the study participants were drawn from almost all departments providing the information about inventory management and service delivery from all the departments. Nonetheless, the numbers varied with the willingness of the employees to participate in the study.

4.1.3 Description of the age of respondents

The details of the age of the respondents was as shown in Figure 4.1 below

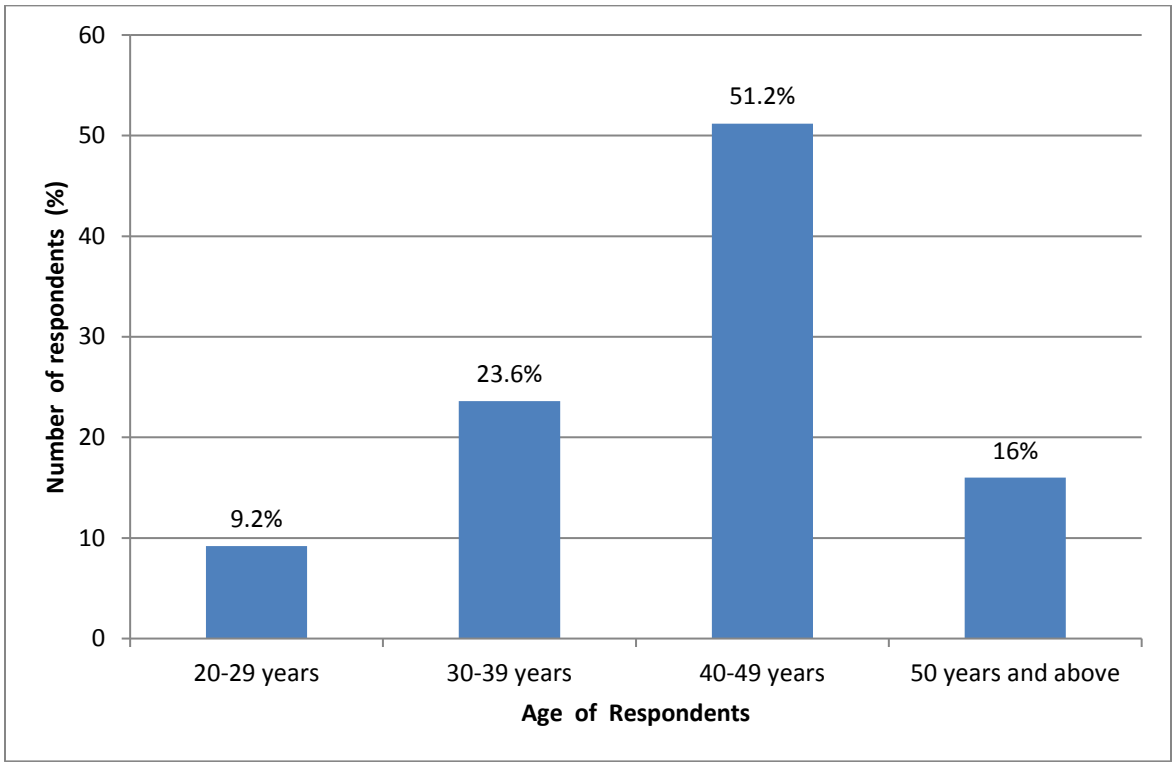


Figure 4.1: Age of the respondents

Source: Primary Data, 2017

Results show that 51.2% and the majority were 40-49 years of age, while those between 30-39 years were 23.6%, and 16% were 50 years and above. Only 9.2% were 20-29 years of age. This distribution shows that a large number of employees were in the age brackets o 30-49 years which was associated with the average age of professional medical staff, after attaining series of training and education.

4.1.4 Genders of respondents

The study examined and described details of gender of the participants in Figure 4.2 below.

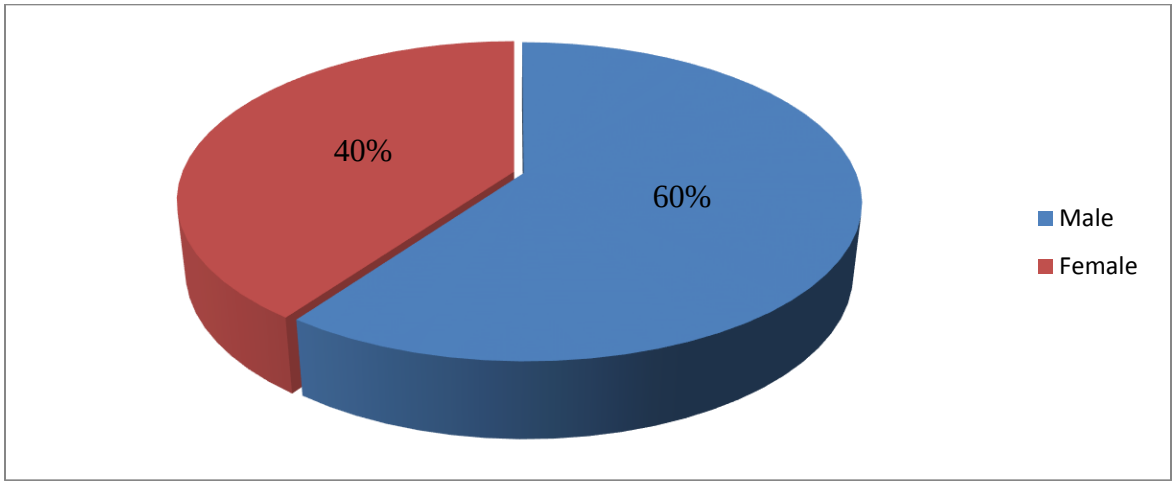


Figure 4.2: Gender characteristics of the respondents
Source: Primary data, 2017

Table 4.2 above reveal that 60% of the respondents were males and 40% were female. This could indicate that there was still low level of female employees serving in Mulago Hospital. However, for purposes of gender balanced picture of responses, both male and female respondents were contacted.

4.1.5 Duration of service at Mulago Hospital

Study findings on the length in years of service by participants in Mulago hospital was established as in Table 4.3 below.

Table 4.3: Duration of service of respondents at Mulago Hospital

Duration of service	Frequency	Percent
less than 1 year	20	8.0
1-4 years	60	24.0
5-9 years	99	39.6
10 years and above	71	28.4
Total	**250**	**100.0**

Source: Primary data, 2017

Table 4.3 show that majority of the respondents had worked at Mulago hospital for 5-9 years (99), followed by those who had worked for 1-4 years (60), then 1 years and above (71) and lastly less than 1 year (20). These represent 39.6%, 28.4%, 24%, and 8% respectively. This shows that the hospital had experienced staff, since they had served for a number of years, and this provided the researcher with information drawn from experience of events as they have occurred at the hospital for a long period of time regarding inventory management and service delivery.

4.1.6 Education characteristics of respondents

Details regarding the age of respondents was as shown in Table 4.4 below

Table 4.4: Education level of respondents

Qualifications	Frequency	Percent
Diploma	50	20.0
Degree	89	35.6
PhD	11	4.4
Certificate	79	31.6
Masters	21	8.4
Total	**250**	**100.0**

Source: Primary data, 2017

In Table 4.4 above, it can be revealed that majority of the respondents who are also employees of Mulago Hospital had degree (35.6%) followed by those with certificate (31.6%) and diploma. Others had diploma (20%), Master‘s degree (8.4%), and 4.4% were PhD holders. This means the employees at Mulago were adequately qualified depending on the areas they served under. Most of the non-medical staff had certificates and diplomas in various areas of specialty. This education aspect helped to obtained informed views from the respondents about the study.

4.2 Stock requisitioning and service delivery

The study set one of its objectives to establish the effect of stock requisitioning on the service delivery. Findings are presented in terms of mean and standard deviation of scores obtained from responses obtained. Details of these respondents are as shown in descriptive statistics below.

Table 4.5 Descriptive statistics for stock requisitioning and service delivery

Statements	N	Min	Max	Mean	Std. Deviation
Each Section fills a requisition form to get supplies from stores	250	1	5	2.61	1.583
The requisition form is signed and approved by the section head	250	1	5	3.58	1.530
The requisition of drugs is a time consuming process	250	1	5	3.40	1.631
Supplies of more stock/item done when requisition form is signed by stores assistant	250	1	5	4.00	1.201
Requisition for supplies of stock depends on the delivery times of NMS	250	1	5	3.78	1.265
Requisitions are timely made by user departments directly from stores	250	1	5	3.68	1.510
Requisitions are made by a phone call when items are urgently needed to cater for emergency cases	250	1	5	4.40	.998
Each section orders for more stock before on hand is finished	250	1	5	3.75	1.211
Valid N (listwise)	250				

Source: Primary data, 2017

Details in table 4.5 shows the various responses obtained in regard to stock requisitioning and service delivery at Mulago Hospital. The statements have been ranked by responses in terms of their means and standard deviation so as to deduce meaning out of the results. Discussion of the findings according to corresponding statements tested follows;

Results as found in Table 4.5 show that respondents majority of the respondents seem not to agree with the view that each section fills a requisition form to get supplies from stores as responses show the mean value of 2.61. However, corresponding standard deviation reveal a significant value of 1.583 which shows that there were clear variations in the responses an impaction that a few sections got their supplies from stores. This generally shows that decentralized stock requisition was not commonly used. Centralization of stock requisitioning was also reflected in the study of Jorgenson (2014), revealed that stock requisition involves a number of activities being done at the main store.

Regarding the view that the requisition form is signed and approved by the section head, the mean of responses of 3.58 close to 4 was established and the standard deviation of 1.530 obtained. This implicitly implies that a large number of respondents agreed with the statement, and hence shows that stock requisitioning was a process, done by head of section in the hospital for all required facilities, equipment, drugs and items. This finding is also in line with Brent & Tokar (2013) who revealed that Procurement officer in collaboration with the accounting officer determines which inventory type is required, and by which quantities and this is not only key but a duty of such officials or head of departments.

From Table 4.5, majority of the respondents agreed with the view that requisition of drugs is a time consuming process, reflected by the mean value 3.40 tending to 4. However a significant standard deviation of 1.631 was ascertained meaning that some respondents considered it not time consuming. It was indeed considered a time consuming process covering a number of activities just as it was pointed out by Weele (2015) when he cited that requisition is the process of outlining and putting to print the forecasted quantities of stocks needed by the organization and it may not only cost demand but laborious.

Results above indicate that most respondents agreed that supplies of more stock/item is done when requisition form is signed by stores assistant and thus requisition form and its approval were key in the process of stock requisitioning at Mulago Hospital. Nonetheless, the standard deviation of 1.201 was obtained implying there were other varying responses on the statement. But since the mean was 4.00, it implies stock requisition forms and its approval by stores assistant was a core practice and it helped to ensure when, by how much and from which point were stock requested to meet service needs. This finding confers with. Muyingo et al., (2012) who revealed that proper requisition of supplies is that done by the right person and if so it helps to cut shortages to zero or tolerable levels.

Regarding the view that requisition for supplies of stock depends on the delivery times of NMS, findings in Table 4.5 shows the mean value of 3.78 and standard deviation of 1.265 were obtained from the responses. This indicates that majority of the respondents agreed with the statement despite some variances in their views. This implies that requisitions usually wait for supplies from NMS to be effected for necessary services' delivery at the hospital. When NMS has not supplied some requested for stock may not be available. These findings are in agreement

with Omaswa et al., (2011) who said that supplies to public hospitals in Uganda are done by National Medical Stores.

Results in Table 4.5 provides that the mean value of 3.68 close to the point of agreement (4), and standard deviation of 1.510 were obtained regarding the views that requisitions are timely made by user departments directly from stores. This implying that majority of the respondents agreed that for effective service delivery there should be timely requisitions for supplies.

When asked on the view that requisitions are made by a phone call when items are urgently needed to cater for emergency cases, the mean value of 4.4 and standard deviation of 0.998 were obtained from the participants' opinions. This shows that majority strongly supported the statement. When an emergency occurs, there can be direct requisitioning of supplies to save the life of the patient if possible; this finding shows exceptional incidences of emergency.

The results reflected in Table 4.5 show the mean of 3.75 close to the mark of 4, which implies majority of the respondents agree with the statement that each section orders for more stock before on hand is finished. It was this established that requisitioning is a continuous process done as soon as stock levels reduce at the service points in the hospital, and if effected this could ensure continuous service delivery. These findings complement the earlier view of Ramjee (2011) who revealed that stock requisition is start the inventory management cycle and continues as the firm replaces/replenishes its stock levels.

Table 4.6 showing the Model Summary of a regression results on Stock Requisitioning

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.839[a]	.704	.703	.63051

a. Predictors: (Constant), stock requisition
Primary data, 2017

Table 4.6 above shows a model summary of the regression results on the effect of stock requisitioning and service delivery. The model summary therefore indicates that stock requisition (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.703 (70.3%) whereas the remaining percentage is by other factors. The table further revealed that there was a positive and significant relationship between stock requisitioning and service delivery denoted by R=0.839 (83.9%). This implies that an increase / improvement in stock requisitioning will lead to an increase / improvement by the same margin on service delivery.

4.3 Stock taking and Service delivery at Mulago Hospital

The second objective was to establish the effect of stock taking on service delivery in public health institutions. The descriptive statistics about stock tacking service delivery were as shown in Table 4.6 below.

Table 4.7: Descriptive statistics of stock taking and service delivery

Statements	N	Min	Max	Mean	Std. Deviation
Stock counted is matched against stock cards periodically	250	1	5	3.86	1.396
Stock cards are used and are updated on the daily basis	250	1	5	2.30	1.293
Stock is counted and recorded at the time of being put in shelves or being delivered to various sections	250	1	5	4.35	.884
The hospital maintains an item register, with clear descriptions, expiry dates, name and unique code that identifies each item	250	1	5	4.02	1.123
Each patient or doctor or section that receives drugs or other items acknowledges receipt to ensure accountability	250	2	5	4.66	.635
Stock tacking helps to check and remove expiry and damaged drugs from stores	250	2	5	4.47	.653
Stock moving out of stores is recorded in a stock issue out book to avoid misuse/wastage	250	1	5	4.43	.867
The stores in charge update the various sections, doctors and other users of the remaining quantity of fast moving items.	250	1	5	2.14	1.244
Valid N (listwise)	250				

Source: Primary data, 2017

Results in table 4.7 shows the detail of the mean and standard deviation to interpret the results obtained about stock taking and service delivery in public health institutions. The details of the survey in regard to the statements are as follows.

From the results in Table 4.7, it is evident that majority of the respondents agreed that as a practice of stock taking, stock is counted and matched against stock cards periodically. This was reflected by the mean value of 3.86, standard deviation of 1.396 of the responses obtained. This implies that stock tacking was done periodically by use of physical counting and recording on stock cards. This was also in line with Coulter & Shepherd, (2005) who noted that stock-taking is an intensive annual activity done continuously by means of a cycle count, over defined period, as per the organization's line of business.

In table 4.7 above , survey results show the mean value of 2.30 which is below average, and this suggests that respondents did not believe that stock taking is regularly done on daily basis using stock cards. However, the standard deviation of 1.293 was obtained suggesting variances in opinions about this statement, an implication that a few sections conducted stock taking on

daily basis using stock cards. These included stores section and procurement departments. Nonetheless, the practice of stock taking was not regular daily activity. This finding contradicts with the view of Dimitrios & Koumanakos (2015) who noted that stock taking is a regular and routine activity especially where the stock flow is a daily activity.

As reflected in Table 4.7, the mean value of 4.35 and the standard deviation of 0.884 were established regarding the view that stock is counted and recorded at the time of being put in shelves or being delivered to various sections. Majority of the respondents strongly agreed with the assertion statement. This implies that as a practice for better service delivery, stock taking was one on receipt of supplies, and at the time of shelving it so that users can know how much of what drugs/medicines/facilities/equipment have been supplied for use at the section. This confers with Farney & Gupta (2013) who noted that stock taking is an activity for accountability or counters checking and thus can be done at acquisition or on shelving, to ensure that the right stock is held.

Results above show that the mean of 4.02 and standard deviation of 1.123 were obtained regarding the views that the hospital maintains an item register, with clear descriptions, expiry dates, name and unique code that identifies each item. This seems to suggest that majority were in agreement with this statement. In order to keep track record of what is available and what needs to be supplies, a register of stock was kept, and this finding confirms what Caldwell et al., (2014) noted that stock taking process helps to keep close look to records regarding stock of item needed and those held by the organization.

The results revealed the mean value of 4.66, and standard deviation of 0.635 regarding the view that each patient or doctor or section that receives drugs or other items acknowledges receipt to ensure accountability. This shows most participants strongly agreed with the statement and there were minor variances in responses provided. This confirms that stock taking is done mainly at the user ends by acknowledging receipt of supplies provided for service delivery. This finding agrees with Falkenberg & Tomson (2010) who recounted that stock taking give a true record of what is acquired, used and balance recorded as it is received.

Survey results in Table 4.7 show that a mean value of 4.47 close to the maximum score of 5 was obtained regarding the view that by undertaking stock taking, the hospital is able to check and remove expiry and damaged drugs from stores. This indicates clearly that stock taking when properly done is Key in ensuring provision of quality drugs and medicines and hence can result into better service delivery.

The findings reveal that majority of the respondents strongly agreed with the view that
Stock moving out of stores is recorded in a stock issue out book to avoid misuse / wastage, although the standard deviation of 0.867 was obtained to account for a few variances in the respondents' opinions. This implies that for quality service delivery, stock taking should star at point of issuance, and ensure that minimal losses, damages and misuse of drugs is done along the supply chain from stores to end user.

When asked on whether the stores in charge update the various sections, doctors and other users of the remaining quantity of fast moving items, findings showed the mean value of 2.14 and the standard deviation of 1.244. Despite the varying opinions received, majority of the respondents strongly disagreed that there was such formal communication. Nonetheless, some notification of

drugs out of stock was done by notice or response to requisitions made for that particular drugs/medicines. This implies that service delivery would be at stand still with no communication that drugs were getting out of stock.

Table 4.8 showing the Model Summary of regression results on Stock-taking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.874[a]	.763	.762	.56446

a. Predictors: (Constant), stock taking

Primary data, 2017

Table 4.8 above shows a model summary of the regression results on the effect of stock-taking and service delivery. The model summary therefore indicates that stocktaking (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.762 (76.2%) whereas the remaining percentage is by other factors. The table further revealed that there was a positive and significant relationship between stock-taking and service delivery denoted by R=0.874 (87.4%). This implies that an increase / improvement in stock-taking will lead to an increase / improvement by the same margin on service delivery.

4.4 Stock storage and Service delivery

The other objective of the study was to assess the effect of storage on service delivery in public health institutions. In response to this objective the following descriptive statistics were established basing on the mean and standard deviation of responses.

Table 4.9: Descriptive statistics on stock storage and service delivery

	N	Min	Max	Mean	Std. Deviation
There is one store for all items, supplies, drugs and equipment supplied to Mulago Hospital	250	2	5	4.23	.730
Items and drugs with special storage requirements are kept in the refrigerator for safety	250	1	5	3.81	1.166
Each item stored in shelves or refrigerators are clearly labeled.	250	1	5	2.66	1.380
Inventory items are stored in sections where they should be used to facilitate user accessibility	250	1	5	2.32	1.258
Stock for commonly requested items is stored in shelves to minimize costs of handling	250	1	5	4.17	1.073
Expired and damaged drugs, items or medicines are removed from the shelves or the store and are kept separately.	250	2	5	4.32	.783
There is enough store space to stock all supplies obtained from NMS	250	1	5	4.39	.922
There is enough and well trained staff to handle stock storage activities in each section of this hospital	250	1	5	2.29	1.408
Valid N (listwise)	250				

Source: Primary data, 2017

In table 4.9 are the opinion responses about stock storage and service delivery at public hospitals drawing inference from Mulago Hospital. The results were analyzed using mean and standard deviation to draw conclusions. Details of the statement tested are discussed as follows;

The results of the survey as reflected in Table 4.9, suggest that respondents agreed that there is one main store for all items, supplies, drugs and equipment supplied to Mulago Hospital. This is shown by the mean of 4.23 and there were a few variances in this opinion reflected by the standard deviation of 0.730. This is a manifestation that Mulago Hospital mainly uses centralized storage system of stock. Supplies are received at one main store and then distributed

to user points and this finding relate with Yang et al., (2016) maintain that storage can also be considered in terms of decentralized or centralized system, or having a point-of-use (POU).

Table 4.9 shows that majority of the respondents agreed that Items and drugs with special storage requirements are kept in the refrigerator for safety as reflected by the mean of 3.81. However, there was the significant standard deviation of 1.166 which was a manifestation of variances in opinions about this aspect. Generally special drugs with special storage requirements were stored separately under relevant storage environment. These findings are in agreement with Brent & Tokar (2013), who revealed that storage can be done through specialized refrigerators depending on the fragile nature of the items under storage.

Regarding the view that each item stored in shelves or refrigerators are clearly labeled, results show the mean value of 2.66 was established, and indication that majority of the respondents disagreed, and there very variances in opinions as well reflected by the standard deviation of 1.380 about this statement. This implies that minimal attention was paid to stock in shelves.

The results show that respondents disagreed with the view that inventory items are stored in sections where they should be used to facilitate user accessibility and this was reflected by the mean of 2.32 and standard deviation of 1.258. This shows that to great extent storage practices done at Mulago hospital did not allow easy accessibility to staff for drugs /medicines and facilities as and when they needed it., which subsequently resulted to poor service delivery.

Results in table 4.9 shows that the mean value of 4.17 although the standard deviation of 1.073 was established regarding the view that stock for commonly requested items is stored in shelves to minimize costs of handling. This implies that proper storage by use of shelves was vital in mitigating the handling costs which could improve service delivery. This was also in line

with Farney et al., (2004) revealed that effective stores management is a target for at least all organizations especially those dealing with handling of supplies.

Table 4.9 reveals that respondents agree that expired and damaged drugs, items or medicines are removed from the shelves or the store and are kept separately. This was revealed by the mean value of 4.32 and the standard deviation of 0.783 was also obtained in regarding to variances in opinions presented. This implies that for effective service delivery, damages and expire drugs were separated and stored separately awaiting to be destroyed/burnt.

Results of the survey show that majority of the respondents agreed with the view that there is enough store space to stock all supplies obtained from NMS. This was revealed by the mean value of 4.39 and a minimal standard deviation of 0.922 variance in scores as established. This implies that there was enough space for supplies although the NMS hardly met the required supplies, and this was to some extent responsible for poor quality service delivery.

The results in Table 4.9 also shows that the mean value of 2.29 which was an indication that majority of the respondents disagreed with the assertion that there is enough and well trained staff to handle stock storage activities in each section of this hospital. This however attracted varying opinion as noted by the standard deviation of 1.408. Lack of enough stock handling staff was important in influencing the quality of service delivery.

Table 4.10 showing the Model Summary of regression results on Stock Storage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841[a]	.707	.706	.62746

a. Predictors: (Constant), stock storage

Primary data, 2017

Table 4.10 above shows a model summary of the regression results on the effect of stock storage and service delivery. The model summary therefore indicates that stock storage (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.706 (70.6%) whereas the remaining percentage is by other factors. The table further revealed that there was a positive and significant relationship between stock storage and service delivery denoted by R=0.841 (84.1%). This implies that an increase / improvement in stock storage will lead to an increase / improvement by the same margin on service delivery.

4.5 Descriptive statistics on service delivery

Service delivery is Key in any organization, and this study sought to examine the status of service delivery at Mulago Hospital. Responses based on the mean and standard deviation of responses to the service delivery were established as presented below.

Table 4.11: Descriptive statistics on service delivery at Mulago Hospital

	N	Min	Max	Mean	Std. Deviation
Patients get drugs and medicines they need at this hospital	250	1	5	2.20	1.233
There are minimal referrals Mulago makes to other hospitals	250	1	5	2.27	1.515
The services and drugs are provided on a timely basis	250	1	5	2.33	1.447
There is always a stand by doctor to handle an emergency case/ patients	250	1	5	3.61	1.325
All desired health services are accessible when one goes to Mulago	250	1	4	1.82	.740
Departments have enough drugs to meet the needs of patients	250	1	5	1.65	.942
Services provided at Mulago hospital are good and satisfactory	250	1	5	2.18	1.155
There is enough space and beds in the wards for in-patients	250	1	5	2.31	1.485
Valid N (listwise)	250				

Source: Primary data, 2017

Responses regarding the aspects reflected in the service delivery of Mulago Hospital were pointed out under various statements as shown in the description below.

Results of the study in Table 4.11 shows that majority of the respondents disagreed to the fact that patients get drugs and medicines they need, and this was indicated by the mean value of 2.20 and the standard deviation of 1.233 was also established. This was an indication of lack of drugs and medicines which was a poor indicator of service delivery for health institution like Mulago. This lack of medicines in public health institutions was also held in the study of Rujumba (2014) who recounted that in public health centers even ordinary health services are also not easy to obtain especially in developing countries.

From the findings in Table 4.11 above, majority of the respondents disagreed to the fact that there were minimal referrals that Mulago made to other hospitals, as revealed by the mean of 2.27 and the standard deviation of 1.515. This indicates that on the contrary, Mulago was making referral to other hospitals, an indication of inadequate service delivery. This aspect was also revealed by Tumwesigye (2016) who noted that patients received at Mulago with special cases/sicknesses are sometimes referred to buy drugs from private practitioners outside the hospital premises.

From information in Table 4.11, respondents revealed that the mean value of 2.33 was reported and the standard deviation of 1.447 obtained regarding the response on whether the services and drugs are provided on a timely basis. These findings indicate that on the contrary services were not timely a reflection of poor service delivery.

Quality of service delivery in hospital can be based on how best it attends to emergency cases. When asked on whether there is always a stand by doctor to handle an emergency case/ patients, majority of the respondents agreed. There was the mean value of 3.61 although there were

variances in opinions about this statement as revealed by the standard deviation of 1.325. This shows that on most occasions there was a stand by doctor to handle emergencies at the hospital.

Results in Table 4.11 show that majority of the respondents disagreed with the view that All desired health services are accessible when one goes to Mulago and this was further revealed by mean value of 1.870. There were few varying opinions to the above assertion, and as such services at the hospital were not accessible as desired. Accessibility to services in public health institutions is low and this was also cited by Huther & Shah (2014) developed an index rating the extent to which people were getting desired health services globally.

From Table 4.11, it is clearly evident that majority of the respondents strongly disagreed that there was enough drugs at hospital department to meet the needs of patients. This was revealed by the mean value of 1.65. However, the standard deviation of 0.942 revealed that a few responses were established disagreeing with the view, and this was also pointed out by

When asked about whether services provided at Mulago hospital are good and satisfactory, the majority of the respondents disagreed (mean, 2.18, standard deviation, 1.155) and this showed that the status of health service delivery at the hospital was considered bad and unsatisfactory to many. Poor quality services in public health institutions were also noted in the study of Rujumba (2014) who postulated that it has remained a challenge for most health practitioners to effectively deliver their services as and when they ought to.

Results in Table 4.11 shows that majority of the respondents disagreed with the view that there is enough space and beds in the wards for in-patients. This was revealed by the mean value of 2.31 and standard deviation of 1.485. This shows that there was no adequate space for in-patients and high level of congestion hindering effective service delivery.

Table 4.12 Showing Model Summary multiple regression results for stock requisitioning, stock-taking and storage

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.880[a]	.774	.772	.55307

a. Predictors: (Constant), stock storage, stock requisitioning, stock-taking

Primary data, 2017

The table above indicates that there is a positive and significant relationship between inventory management and service delivery denoted by the R as 0.880 (88.0%). The results further indicate that the three variables representing inventory management do predict service delivery by an Adjusted R Square of 0.772 (77.2%) whereas the remaining percentage is by the other factors. Thus inventory management affects service delivery of health sector institutions.

Table 4.13 Showing Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.973	.229		-8.630	.000
	Stock requisition	-.082	.108	-.089	-.760	.448
	Stocktaking	.941	.174	.722	5.415	.000
	Stock storage	.286	.083	.259	3.459	.001

a. Dependent Variable: sservicedelivery

Primary data, 2017

The predictor model above indicates coefficients determination where stock requisitioning is represented by; (Beta= -0.089) followed by stock taking (Beta= 0.722) and then stock storage (Beta=0.259).

Qualitative findings

Staff in the record and procurement sections of Mulago Hospital, about their views regarding service delivery and how it was associated with the way inventory management was handled. Most of the respondents contacted revealed that stock is not always enough and it was usually requested by the stores section from National Medical stores (NMS). Supplies from NMS were stored at one central point (stores). Officer in charge of various sections through applying for supplies and filling supply forms were responsible for stock requisitions. However, the practice was not modern, it was tiresome and associated with delays and at times some requested drugs and medicines are not supplied.

In addition, findings from interviews revealed that stock taking was not a regular function for other staff except at the time of asking for replenishments of stocks to user section, as well as when shelving or putting them in stores. The stores largely carry out the function of stock taking through use of stock cards, ledger cards, tally sheets, and record books at the time of acquisition, issuance to user departments and on monthly stock status forms.

The study findings further revealed that storage is a key function in any hospital and at Mulago there is enough space to store drugs and medicines which has never been filled by NMS. However, some of the stock is to zero levels and have taken long without being supplied. Special materials, drugs, facilities and equipment were properly stored under refrigerators, shelves, cabinets as per set storage guidelines. The records staff particularly revealed that there are relevant records of storage of various supplies. However the participants revealed that the function of stock taking and storage required to be improved at the hospital.

4.6 Conclusion

From the above findings, it was found out that stock requisition, stock taking and storage positively affected the availability, accessibility and timeliness of service delivery in public

health institutions, and therefore, there was a strong positive effect of inventory management on service delivery at Mulago and public health institutions generally.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents summary of the study findings as per the study objectives. It also conclusions and recommendations which are based on both the study findings and other relevant literature considered necessary and vital to be used in future to improve inventory management and service delivery in health institutions.

5.1 Summary findings

This part presents the summarized results based on the study objectives.

5.1.1 Demographic characteristics

The results from study findings indicated that 60% of the respondents were males and 40% were female; 71.2% of the respondents were non-medical staff working in various sections of the hospital, while 24% were medical staff, 2.4% represented head of sections, 1.6% were head of departments and only 0.8% were administrators. Results also show that majority (20.4%) were employees in the records department followed by 16.4% from the casualty and emergency section, 14.4% were from procurement and 12% from the maternity. Other respondents, 10.4% were employees serving in the general outpatient (OPD), while 10% were from the cancer institute, 8% from the heart institute, 6.4% from general top administration and only 2% were from the mortuary section. From the above description the study participants were drawn from almost all departments providing the information about inventory management and service

delivery from all the departments. Nonetheless, the numbers varied with the willingness of the employees to participate in the study.

Majority of the respondents had worked at Mulago hospital for 5-9 years (99), followed by those who had worked for 1-4 years (60), then 1 years and above (71) and lastly less than 1 year (20). It was also revealed that majority of the respondents who are also employees of Mulago Hospital had degree (35.6%) followed by those with certificate (31.6%) and diploma. Others had diploma (20%), Master's degree (8.4%), and 4.4% were PhD holders. This means the employees at Mulago were adequately qualified depending on the areas they served under. Most of the non-medical staff had certificates and diplomas in various areas of specialty.

5.1.2. Stock requisitioning and service delivery

Results obtained indicate that majority of the respondents did not to agree with the view that each section fills a requisition form to get supplies from stores as responses show the mean value of 2.61. However, corresponding standard deviation reveal a significant value of 1.583 which shows that there were clear variations in the responses an impaction that a few sections got their supplies from stores.

Regarding the view that the requisition form is signed and approved by the section head, the mean of responses of 3.58 close to 4 was established and the standard deviation of 1.530 obtained. Majority of the respondents agreed with the view that requisition of drugs is a time consuming process, reflected by the mean value of 3.40. However a significant standard deviation of 1.631 was ascertained meaning that some respondents considered it not time consuming. Results above indicate that most respondents agreed that supplies of more stock/item is done when requisition form is signed by stores assistant and thus requisition

form and its approval were key in the process of stock requisitioning at Mulago Hospital. Nonetheless, the standard deviation of 1.201 was obtained implying there were other varying responses on the statement. But since the mean was 4.00, it implies stock requisition forms and its approval by stores assistant was a core practice and it helped to ensure when, by how much and from which point were stock requested to meet service needs. When asked on the view that requisitions are made by a phone call when items are urgently needed to cater for emergency cases, the mean value of 4.4 and standard deviation of 0.998 were obtained from the participants' opinions. This shows that majority strongly supported the statement. When an emergency occurs, there can be direct requisitioning of supplies to save the life of the patient if possible; this finding shows exceptional incidences of emergency.

The model summary therefore indicates that stock requisitioning (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.703 (70.3%) whereas the remaining percentage is by other factors. The table further revealed that there was a positive and significant relationship between stock requisitioning and service delivery denoted by R=0.839 (83.9%). This implies that an increase / improvement in stock requisitioning will lead to an increase / improvement by the same margin on service delivery.

5.1.2 Stock taking and Service delivery at Mulago Hospital

Regarding stocktaking and service delivery, it was evident that majority of the respondents agreed that as a practice of stock taking, stock is counted and matched against stock cards periodically. This was reflected by the mean value of 3.86, standard deviation of 1.396 of the responses obtained; the mean value of 2.30 which is below average, and this suggests that respondents did not believe that stock taking is regularly done on daily basis using stock cards. However, the standard deviation of 1.293 was obtained suggesting variances in opinions about

this statement, an implication that a few sections conducted stock taking on daily basis using stock cards. The results further revealed that majority of the respondents strongly agreed to whether stock is counted and recorded at the time of being put in shelves or being delivered to various sections. This was reflected by the mean value of 4.35 and the standard deviation of 0.884. The mean of 4.02 and standard deviation of 1.123 were obtained regarding the views that the hospital maintains an item register, with clear descriptions, expiry dates, name and unique code that identifies each item. This seems to suggest that majority were in agreement with this statement. The results also revealed the mean value of 4.66, and standard deviation of 0.635 regarding the view that each patient or doctor or section that receives drugs or other items acknowledges receipt to ensure accountability. This shows most participants strongly agreed with the statement and there were minor variances in responses provided; a mean value of 4.47 close to the maximum score of 5 was obtained regarding the view that by undertaking stock taking, the hospital is able to check and remove expiry and damaged drugs from stores. This indicates clearly that stock taking when properly done is Key in ensuring provision of quality drugs and medicines and hence can result into better service delivery.

The model summary therefore indicates that stock-taking (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.762 (76.2%) whereas the remaining percentage is by other factors. The table further revealed that there was a positive and significant relationship between stock-taking and service delivery denoted by R=0.874 (87.4%). This implies that an increase / improvement in stocktaking will lead to an increase / improvement by the same margin on service delivery.

5.1.3 Stock storage and Service delivery

The results of the survey suggest that respondents agreed that there is one main store for all items, supplies, drugs and equipment supplied to Mulago Hospital. This is shown by the mean of 4.23 and there were a few variances in this opinion reflected by the standard deviation of 0.730. This is a manifestation that Mulago Hospital mainly uses centralized storage system of stock; majority of the respondents also agreed that items and drugs with special storage requirements are kept in the refrigerator for safety as reflected by the mean of 3.81. However, there was the significant standard deviation of 1.166 which was a manifestation of variances in opinions about this aspect. Generally special drugs with special storage requirements were stored separately under relevant storage environment. Regarding the view that each item stored in shelves or refrigerators are clearly labeled, results show the mean value of 2.66 was established, and indication that majority of the respondents disagreed, and there very variances in opinions as well reflected by the standard deviation of 1.380 about this statement. The results further revealed that respondents disagreed with the view that inventory items are stored in sections where they should be used to facilitate user accessibility and this was reflected by the mean of 2.32 and standard deviation of 1.258; the mean value of 4.17 although the standard deviation of 1.073 was established regarding the view that stock for commonly requested items is stored in shelves to minimize costs of handling. This implies that proper storage by use of shelves was vital in mitigating the handling costs which could improve service delivery. Respondents agreed that expired and damaged drugs, items or medicines are removed from the shelves or the store and are kept separately. This was revealed by the mean value of 4.32 and the standard deviation of 0.783 was also obtained in regarding to variances in opinions presented; majority of the respondents agreed with the view that there is enough store space to stock all supplies obtained

from NMS (mean value of 4.39 and a standard deviation of 0.922). The results also show that the mean value of 2.29 which was an indication that majority of the respondents disagreed with the assertion that there is enough and well trained staff to handle stock storage activities in each section of this hospital. This however attracted varying opinion as noted by the standard deviation of 1.408.

The model summary therefore indicates that stock storage (predictor) has a significant effect on service delivery in public health institutions as indicated by the Adjusted R Square of 0.706 (70.6%) whereas the remaining percentage is by other factors. The table further revealed that there was a positive and significant relationship between stock storage and service delivery denoted by R=0.841 (84.1%). This implies that an increase / improvement in stock storage will lead to an increase / improvement by the same margin on service delivery.

5.2. Conclusions

Based on the findings, the study made the following conclusions:

The process of stock requistion at mulago and possibly for all other public health institutions was based on supplies from NMS and the inventory management system at the hospital. The function of stock requisitioning positvely influenced the state of service delivery by ensuring accessibility, availability and quality of services delivered to the public.

On the aspect of stock taking on service delivery in public health institutions, it was revealed that stock tacking was a periodical activity usually done on quarterly or annual basis before asking for more supplies from NMS. However, in some departments such as records, stores and procurement, stock tacking was done on daily basis for purposes of accountability, and ensuring

continuous service delivery. Stock taking has a significant effect on the service delivery in public hospitals.

Findings revealed that storage was a core function at Mulago Hospital and largely centralized. Stock storage had a significant effect on the level of service delivery and this was evident in ensuring availability of supplies of drugs and medicines at all times, accessibility to services/drugs needed and as such influenced the quality of service delivery.

It was concluded that to attain better health services, public hospitals, Mulago inclusive should focus on improving the inventory management functions, especially stock requisition, taking and storage. There was a significant effect of inventory management on service delivery in public health institutions.

5.3. Recommendations

The study basing on the findings and conclusions, made the following recommendations:
There was need to strengthen its requisition procedures since most requisitions activities were largely done by the procurement unit from NMS, and head of sections for the user departments. Each team of employees working on specific area of specialization should be allowed to place their requisitions to the main store.

The study recommends that the head of Mulago Hospital as well as National Medical stores should review their stock requisition plan so that it can be a regular practice (done at least at an interval of 2 months) so as to ensure availability of drugs/medicines at the hospital.

The study also recommends that progress in the stock requisitioning should be computerized instead of using telephone to order to supplies in case of emergency. Computerization of requisitioning practice need to be adopted for the entire hospital requisitioning services.

Regarding stock taking, the study recommends that effective stock taking should be continuous and carried at all points were supplies and usage of drugs /medicines and other facilities takes place. There should be computerized stock taking at acquisition, during allocations to user departments, and daily balancing of remaining stock.

The study further recommends that storage especially departmental and section stores should be improved so that the function can be decentralized for easy accessibility and timely service delivery.

5.4 Suggestions for further study

Basing on the findings and conclusions of the study, the following area is suggested for further study

The impact of inventory management practices in small and medium sized private health institutions on service delivery in Uganda.

This is so because the largest population in Uganda has had challenges with service delivery in the public health institutions and often times seek treatment in private health clinics and hospitals. This is the reason as to why Am suggesting this study in order to ascertain if inventory management practices have an impact on service delivery in small and medium sized private health institutions in Uganda.

REFERENCES

BOOKS

Andrews. A. & Anwar, M. (2012). Complex Organizations: A Critical Essay, Glenview. 3rd Ed. New York: Random House

Baily, D., Jessop, S. & Morison, M. (2014). The Functions of the Executive, Cambridge: Harvard University Press.

Bhatia, F. (2013). Importance of Recording keeping. 4th Ed, Dryden Press, London, UK.

Brent, P. & Tokar, J., R. (2013). Performance and Performance Management. Handbook of Public Policy, London: Sage

Caldwell, N.D. Roehrich, J.K. & Davies, A.C. (2014). Inventory management in contemporary Business.5th Ed. Pitman: London

Cannella S. (2013). Supply Chain Management: Simplified Edition. Oak Tree Publications, Berlin.

Christensen, T. (2007). The Organization Theory and the Public Sector. 4th Ed. Routledge: Taylor & Francis Group.

Ciancimino, (2010). Strategic Marketing. 6th Ed. Heinemann Publications Inc.

Coulter, J & Shepherd, A. 2015. Strategic Production and Inventory Management. 3rd Ed. Longmans Publications, Italy.

Dwyer, S. & Christopher, A. (2010). Purchasing and Materials Management. McGraw Hill, USA.

Gayle, E. & Pimhaidzai, W. (2013). Survivors: How to Keep Your Best People on Board after Downsizing in Health Services**.** CA: Consulting Psychologists Press.

Ghiani, Laporte & Musmanno, (2004). The Essential Public Manager, Maidenhead: Open University Press.

Hepler, M & Strand. R. 2010. Opportunities and responsibilities in health care. Hospital Pharmacy. Policy & Research Unit. University of London.

Jorgenson, D.W.; HO, M.S.; & Samuels, J.D. (2014). Long-term Estimates of U.S. Productivity and Growth of firms**.** 4th Ed., Oxford Press, G.B.

Mahlakoleng, B. (2012). Inventory Management Policy. Northwest Province: California. USA.

Mbabazi, T. (2011). A sure friendly Guide to Research and Research Methods. 2nd Ed. Jontain Co. Ltd. Kampala, Uganda.

Migiro H. & Ambe, E. (2008). Expired Medicines-Are They Safe? Beth Israel Deaconess Medical Center, University Press, Oxford, London

Ouyang, M. (2011). Inventory Control in the Public Sector firms. 5th Ed. Longman Publications.

Perlitz, R. G. (2015). Material Management-An Integrated Approach. 3rd Ed. New Delhi: Prentice Hall and India.

Segeuina, M. (2015). Key to an Effective procurement system. 3rd Ed. MacMillan Publications, London, UK.

Thanabalan, S. 2011. Procurement Planning and Monitoring. 3rd Ed. Longman Publishers, London.

Wales, H. (2015). Book Keeping and Records Management in manufacturing firms. 4th Ed. Longman Educ. Publishers Inc. London.GB.

ONLINE JOURNALS

Boyd, H. (2011). Expiry or Shelf life: The health Sector Example: Journal of Medical practice. Fort Worth.

Deming, H. & Kruger, A. (2014). Storage Management: Simple Approach of Storage activities in manufacturing firms. Journal of International Managers **8 (2).** 9-11

Deming, H. (2006). Quality Assurance and Accreditation: A Glossary of Basic Terms and Definitions -Bucharest, UNESCO-CEPES

Dimitrios, A. & KoumanakoS, P. (2015). Professionalism and Inventory Management. International Journal of Productivity & Management. 5 (12)

Lang, L. & Chowdhury, M. (2006). Fiscal institutions, credit ratings and borrowing costs on NGOs' Performance. Public Budgeting & Finance Journal.

Muyingo, A. Rigoli f, & Dussault G. (2012). Health sector reform and human resources in health. Human Resource Health Journal. World Bank.

Rujumba, A. (2014). Dealing with Health Services -Gap. On-line Medical Practioners Journal – OMPJ- 5 (12).

Sako, F. (2013). Procurement Effectiveness Indicators. Motor Manufacturing firms. Industrial and Corporate Change Journal. Ser. 23 (2).

TanahashI, K. (2014). Materials Management- End User Guide. Department of Information Sciences,146(1/4): 29–40

Yang, F., Wade d. Cook, & Joe, Z. (2016). Inventory Management Models in supply chain efficiency and management. Annals of Operations Research Journal 39 (1).

ONLINE ARTICLES

Anwar, S. (2015). Requisition & Inventory Management System. RiMS. Fisher scientific. www.fishersci.com

Falkenberg, H. & Tomson, L. (2010). World Bank and Pharmaceuticals. Health Policy and Planning. 15 (2).

Farney, F. (2004). National public health expenditure report, 2005–06. Health and Welfare Expenditure Series no. 32

Govender, S. & Watermeyer, F. (2000). Potential Procurement Strategies for Health Industry in SADC region. Health Symposium, July, 2000. Dakar: Senegal.

Hsieh, D. (2002). Compensation organizational strategy and firm performance. Cincinnati: South-Western

Kato, L. (2014). Impact of public procurement management on health service delivery in Uganda: a case study of Itojo hospital in Ntungamo district.

Kizito, A. (2012). Inventory Psychology and Sales Re-engineering: An Emerging Quality Application in Stores Management. Quality Progress: 59–63.

Kombo D. & Tromp, A. (2010). Proposal and Thesis Writing. Nairobi: Kenya. Pauline Publications Africa.

Tumwesigye, E. (2016). Ministerial Statement on the Scope of work done at Mulago Hospital Construction Programme. Ministry of Health. Kampala: Uganda.

Tumwine, Y; Kutyabami, P. Odoi, R & Kalyango, N. (2010). Availability and Expiry of Essential Medicines and Supplies in a Rural Ugandan Hospital: Tropical Journal of Pharmaceutical Research 9 (6)

Weele, M. (2015). Human resources: the Cinderella of health sector reform in Latin America. Human Resources for Health. July, 2010.

Wittings, W.A. (2011). Building Value through Procurement: A focus on Africa. Paper presented to 10th International Anti-Corruption Conference, Durban South Africa.

World Health Organisation, WHO. (2015). Guidelines on Procurement under IBRD Loans and IDA credits.

World Health Organisation, WHO. (2016). Supplies Management in Public Health Centers. Procurement guidelines.

REPORTS

Ministry of Health, MoH. (2016). Procurement Procedural Manual. Standard Procedures for Procurement in the Public Health Sector, Kampala: Uganda.

Mulago national hospital (2016). Mulago Hospital Annual Report FY 2015/16. Mulago Hill. Kampala: Uganda.

Omaswa F, Burnham G, Baingana. G, Mwebesa H, & Morrow R.(2011). Quality Assurance: Uganda Ministry of Health, Entebbe, Uganda.

Oso, Y. O & Onen, D. (2009). A general Guide to Writing Research Proposal and Report. 2nd Ed. School of Education: Makerere University.

World Health Report, WHR. (2015). Storage and Inventory Control in Health. WHO statistics. NY-USA.

Zipkin, D. (2010). Health Service Delivery. Bulletin of the World Health Organization, 2010, 85:146–151

ACTS

Republic of Uganda (2003). The Public Procurement and Disposal Act, PPDA (2003) Act. Gazette. Entebbe: Uganda.

Appendices

Appendix I: Letter of respondents' consent

Uganda Martyrs University
C/o Rubaga Campus
P.O. Box 5498
Kampala Uganda
20/05/2017

Dear Sir/ Madam,

Re: Asking for your consent to participate in the study

You have been randomly selected to participate in this survey study on the topic, "The effect of inventory management on service delivery in public health institutions". This is an academic study leading to the award of a Bachelor of Finance and Accounting degree of Uganda Martyrs University. As member of management and staff of Mulago Hospital where this study is to be conducted, you are expected to know/ provide us with information you know about Inventory Management and service delivery.

You will be contacted through a survey semi-structured questionnaire and questions will be on the effect of requisitioning on service delivery in public health institutions, effect of stock taking on service delivery in public health institutions and the effect of storage on service delivery in public health institutions. After answering the questions, you will return the questionnaire to researcher.

The purpose of this letter is to ask for your consent and to firm your willingness to participate. **If you consent please fill and give/send back the tear-off portion below.** Details of the study and the data collection tools will be delivered later at the time of data collection.

Yours faithfully,

…….....

BABIRYE GERALDINE
0752-935320
Student/Researcher
Uganda Martyrs University

Tear- off portion

PLEASE FILL-IN IF YOU CONSENT

I have understood the purpose of the study on the effect of inventory management on service delivery in public health institutions. I hereby consent to participate.

....
Name Sign Date

Appendix II: Questionnaire for the study

Questionnaire for Management and Staff of Mulago Hospital

Dear Respondent,

You are being contacted to participate in this study on the topic, "The effect of inventory management on service delivery in public health institutions": A case study of Mulago National Referral Hospital (MNRH)". Please fill or respond with in this questionnaire for the appropriate answers you consider right. Your responses will be treated with lot of confidentiality, unanimous and used only for academic purposes. Please fill or respond as instructed in the sections A, B, C, D, and E below.

Section A: Bio data

Please put a tick mark (√) in the option boxes provided or fill in the spaces provided.

A1 Position held at Mulago Hospital

Administrator ☐ Head of Department ☐

Head of A section ☐ Medical Staff ☐

Non-Medical Staff ☐

Specific title (if you please).....

A2. Department.....

A3 Age of respondent

20-29 ☐ 30-39 ☐ 40-49 ☐ 50 and above ☐

A4 Gender Male ☐ Female ☐

A5 Experience in years of service

Less than 1 ☐ 1-4 ☐ 5 – 9 ☐ 10 and above ☐

A6 Qualification (highest)

Diploma ☐ Certificate ☐

Degree ☐ Masters ☐

Ph.D. ☐
Others (specify below)
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Section B: Questions on the stock requisitioning on service delivery in public health institutions

For question 7, please respond to the statements, by giving your rank opinion to the statements given. The scale is**;**

1= strongly disagree, **2= disagree,**
3= not sure **4= agree**
5= strongly agree

7. Rank the following statements regarding stock requisitioning activities at Mulago Hospital

S.N	**Item**	Response				
		1	2	3	4	5
1.	Each Section fills a requisition form to get supplies from stores					
2	The requisition form is signed and approved by the section head					
3	The requisition of drugs is a time consuming process					
4	Supplies of more stock/item done when requisition form is signed by stores assistant					
5	Requisition for supplies of stock depends on the delivery times of NMS					
6	Requisitions are timely made by user departments directly from stores					
7.	Requisitions are made a phone call when items are urgently needed to cater for emergency cases					

8.	Each section orders for more stock before on hand is finished					

Any other aspect related with stock requisitions at this hospital (specify)

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Section C: Questions on stock taking practices at Mulago Hospital

For question 8, please respond to the statements, by giving your rank opinion to the statements given. The scale is**;**

1= strongly disagree, **2= disagree,**
3= not sure **4= agree**
5= strongly agree

8. Rank the following statements regarding stock tacking activities at Mulago Hospital

SN	**Item**	Response				
		1	2	3	4	5
1	Stock counted is matched against stock cards periodically					
2	Stock cards are used and are updated on the daily basis					
3	Stock is counted and recorded at the time of being put in shelves or being delivered to various sections					
4	The hospital maintains an item register, with clear descriptions, expiry dates, name and unique code that identifies each item					
5	Each patient or doctor or section that receives drugs or other items acknowledges receipt to ensure accountability					

6	Stock tacking helps to check and remove expiry and damaged drugs from stores					
7	Stock moving out of stores is recorded in a stock issue out book to avoid misuse/wastage					
8	The stores in-charge updates the various sections, doctors and other users of the remaining quantity of fast moving items.					

Any other aspect related to stock tacking at this hospital (specify)

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Section D: Questions on stock storage practices at Mulago Hospital

For question 9, please respond to the statements, by giving your rank opinion to the statements given. The scale is**;**

1= strongly disagree,
2= disagree,
3= not sure
4= agree
5= strongly agree

9. Rank the following statements regarding stock storage activities at Mulago Hospital

SN	**Item**	**Responses**				
		1	**2**	**3**	**4**	**5**
1	There is one store for all items, supplies, drugs and equipment supplied to Mulago Hospital					
2	Items and drugs with special storage requirements are kept in the refrigerator for safety					
3	Each item stored in shelves or refrigerators are clearly labeled.					
4	Inventory items are stored in sections where they should be used to facilitate user accessibility					

5	Stock for commonly requested items is stored in shelves to minimize costs of handling					
6	Expired and damaged drugs, items or medicines are removed from the shelves or the store and are kept separately.					
7	There is enough store space to stock all supplies obtained from NMS					
8	There is enough and well trained staff to handle stock storage activities in each section of this hospital					

Any other aspect related with stock storage at this hospital (specify)

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Section E: Questions on service delivery at Mulago Hospital

For question 10, please respond to the statements, by giving your rank opinion to the statements given. The scale is**;**

1= strongly disagree, **2= disagree,**
3= not sure **4= agree**
5= strongly agree

10. Rank the following statements regarding health service delivery at Mulago Hospital

SN	**Item**	**Responses**				
		1	**2**	**3**	**4**	**5**
1	Patients get drugs and medicines they need at this hospital					
2	There are minimal referrals Mulago makes to other hospitals					
3	The services and drugs are provided on a timely basis					

4	There is always a stand by doctor to handle an emergency case/ patients					
5	All desired health services are accessible when one goes to Mulago					
6	Departments have enough drugs to meet the needs of patients					
7	Services provided at Mulago hospital are good and satisfactory					
8	There is enough space and beds in the wards for in-patients					

Any other aspect related with stock storage at this hospital (specify)

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Appendix III: Interview guide for staff in the records and procurement section of the Mulago Hospital

1. Section:.....

2. Title /Position held:.....

3. What are some of the stock requisition procedures followed at your department?

4. Would you consider stock requisition procedures at your section relevant?

5. What are some of the stock taking activities followed at your department?

6. Would you consider stock tacking at your section effective?

7. What are some of the stock storage activities followed at your department?

8. Would you consider stock storage at your section effective?

Appendix IV: Krejcie and Morgan Table

Table for Determining Sample Size from a Given Population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.