

**INVENTORY MANAGEMENT IN THE GHANA HEALTH
SERVICE AND ITS ROLE IN HEALTHCARE DELIVERY**

(A CASE STUDY OF HEALTH FACILITIES IN HO MUNICIPALITY)

By

Annor Michael Narkotey (BBA)

(PG 4090210)

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DECLARATION

I hereby declare that this submission is my own work towards the Executive Masters of Business Administration and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

Annor Michael Narkotey, PG 4090210
Signature Date

Certified by:

Kpemplie Francis
Supervisor Signature Date

Certified by:

.....
Dean, IDL Signature Date

ABSTRACT

Healthcare systems are organizations established to meet the health needs of target population. Inventory represents the largest single investment in assets for most organizations. While inventory is concerned with monetary issues, health facilities are in the business of saving lives. Although inventory has an important role to play, the emphasis should be on using it in a way that makes a difference to the quality of patient care. Despite efforts being made by the Ministry of Health, Ghana Health Service and its partners to provide the country with health commodities (medicines and medical logistics) to meet the requirements of clients (people who need the healthcare), these commodities are often wrongly managed or inadequate. These therefore leaves the clients with no alternatives than to fall on the traditional medicines or travel over long distances in search of health care or seek spiritual assistance from churches, shrines, witchdoctors and so on. The main objective of this research is to assess the role that inventory management plays in primary healthcare delivery system. To achieve the objective, health facilities in the Ho municipality were chosen for the study. The researcher adopted the stratified sampling method to choose Seventy-Eight respondents. The respondents were divided into three (3) strata in order to ensure that each was appropriately represented in the survey sample. Stratum 1, comprised the inventory managers; Stratum 2, comprised the healthcare providers; and Stratum 3, comprised the healthcare receivers. It was established that majority of inventory managers and healthcare providers leave their jobs or facilities and travel long distances for the health commodities from either the Central Medical Stores (CMS) or the Regional Medical Stores. In most cases, these inventory managers happened to be the only staff at the department or unit, thus

depriving the facility of their valuable service. The researcher recommends that health commodities must be delivered directly to the health facilities from the Central Medical Stores (CMS) and the Regional Medical Store (RMS).

DEDICATION

This project work is dedicated to the Although God who gave me the strength, knowledge and wisdom to carry out this research successfully.

I also dedicate this work to Mr. and Mrs. Raymond Botchey and my children, Mike-Carlos and Mike-Morris.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Countries have different policies and plans in relations to the personal and population-based healthcare goals within their societies. Healthcare systems are organizations established to meet the health needs of target populations. In all cases, according to the World Health Organization (WHO), a well functioning healthcare system requires a robust financing mechanism; a well trained and adequately paid workforce; reliable information on which to base decisions and policies and well maintained facilities and logistics to deliver quality medicines and technologies.

Inventory represents the largest single investment in assets for most organizations. In most organizations, clients have become accustomed to high levels of commodity availability, for which the result has mostly been higher inventory levels (Chopra and Meindl, 2003).

Inventory management is needed as being a portion of supply chain network to guard the healthcare delivery towards any type of disturbance.

According to Versha Kaushal (General Manager, Amrita Institute of Medical Sciences), as most departments depend heavily on supplies, inventory management can ease or cramp a health facility's operations. From a low cost needle to a high-end orthopaedic implant, micro steel instruments, supplies (health commodities) are indispensable during a patient's stay at the health facility. Quality care cannot be provided on time unless required health commodities are available in adequate quantities.

Versha Kaushal, further explained that inventory management therefore plays a crucial role in providing efficient healthcare in relation to three vital aspects of medical supplies used in the health facilities; available, safety and affordability.

1.2 STATEMENT OF THE PROBLEM

Despite efforts being made by the Ministry of Health, Ghana Health Service and its partners to provide the country with health commodities (medicines and medical logistics) to meet the requirements of clients (people who need the healthcare), these commodities are often wrongly managed or inadequate.

All the 2010 annual reports on monitoring and supervisory visits by the various Budget Management Centers (BMCs) - Public Health, Clinical Care and the Health Administration and Support Services of the Volta Regional Health Directorate to all the eighteen (18) Districts in the Volta Region (HO MUNICIPAL inclusive) shows that most communities do not receive efficient health care delivery due to some factors including insufficient or lack of health commodities (Volta Regional Health Directorate, 2010 Annual Report). These therefore leaves the clients with no alternatives than to fall on the traditional medicines or travel over long distances in search of health care or seek spiritual assistance from churches, shrines, witchdoctors and so on.

1.3 OBJECTIVES OF THE STUDY

The main objective of this research is to assess the role that inventory management plays in primary healthcare delivery system.

1. To examine how the inventories (medicines and logistics) are managed in the Volta Region with emphasis on health facilities in Ho Municipality.
- 2 To analyze the role that inventory management plays in healthcare delivery at the health facilities in Ho Municipality.
- 3 To evaluate the perceptions of both the healthcare providers and the healthcare receivers on how the health commodities get to them at the health facilities in Ho Municipalities.

1.4 RESEARCH QUESTION

The study therefore seeks to address the following research questions:

1. How is management of health commodities done by health facilities in the Ho municipality?
2. What role does efficient inventory management play in healthcare delivery at the health facilities in Ho Municipality?
3. What are the perceptions of healthcare providers and healthcare receivers at health facilities in Ho Municipality on the management of health commodities?

1.5 SIGNIFICANCE OF THE STUDY

This project is to help address the factors that lead to the improper or poor inventory management on primary healthcare delivery in the Ho Municipality and how the problem

can be solved or minimized through efficient management of the health commodities available.

The project also served as a reference material for any person that would like to conduct research on health commodity management.

The project again drew the attention of the Ministry of Health, Ghana Health Service especially the Stores, Supplies and Drugs Management Division of the Ghana Health Service and the Volta Regional Health Directorate to the problem in the management of health commodities in the Ho municipality and the Volta Region as a whole.

1.6 SCOPE OF THE STUDY

This study is focused on how the management of health commodities are done by the public health facilities in the Ho Municipality, such as the Volta Regional Health Directorate, the Ho Municipal Health Directorate, and all the Hospitals, the clinics and the Health centers that fall under the umbrella of the Ho Municipal Health Directorate.

The target population of the study comprised primary healthcare providers at the health facilities (Doctors, Nurses, Pharmacists/Pharmacist Technicians, Biomedical Scientist/Laboratory Technicians, and Medical Assistants), Healthcare receivers (Patients that visit the health facilities) and Inventory Managers (those that procure, receives, stores and issues the health commodities)

Table 1.1 Distribution of Health Facilities in Ho Municipality

FACILITY TYPE	NUMBER	STATUS
Regional Health Directorate	1	Functioning
Regional Medical Store	1	Functioning
Municipal Health Directorate	1	Functioning
Hospitals	4	Functioning
Polyclinic	1	Functioning
Health Centers	22	Functioning
Clinics	9	Functioning
Maternity Homes	3	Functioning
Reproductive & Child Health Centers	10	Functioning
Community-Based Health Planning Services	2	Functioning

Source: Ho Municipal Health Directorate, 2011 Annual Report

1.7 ORGANIZATION OF THE STUDY

This study is divided into five (5) main chapters.

Chapter one deals with the general background information about inventory management and Healthcare delivery in general and Ghana in particular, it looks at the statement of the problem, the objective of the study, research questions, significance of the chapters.

Chapter two focuses on the literature review. The literature review is on Primary Healthcare Delivery and Inventory management — Definitions of inventory, types of inventory, reasons for holding inventory, perspectives of inventory management,

inventory management techniques, importance of inventory to an organization, concept of health systems, brief history of Ghana Health Service, and the role of inventory management in healthcare delivery

Chapter three deals with the population, sampling procedure, instruments used, the administration of the instruments and the limitation of the study.

Chapter four focuses on the results and discussions of the data collected from respondents. The results and discussions covers the findings made on:

- Management of health commodities
- The role played by inventory management in provision of healthcare delivery.
- The perceptions of the respondents

Chapter five presents the summary, the conclusion and the recommendations of the study.

1.8 LIMITATIONS

Due to the busy schedules of the respondents, it was not easy to get them to answer the questionnaires on time.

The study result was limited to the Ho Municipality therefore generalizations made for the whole country.

Last but not least, some respondents failed to return the questionnaires and/or not interviewed at all.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to review literature and theoretical framework of inventory management, which is the management of the largest single investment in assets for most organizations.

The submissions and thoughts of various authors on inventory, inventory management, health systems, and the role of inventory management in healthcare delivery were reviewed and discussed under the following headings:

- Definitions of Inventory
- Types of Inventory
- Reasons for Holding Inventory
- Perspectives of Inventory Management
- Inventory Management Techniques
- Importance of Inventory to an Organization
- Concept of Health Systems
- Brief History of Ghana Health Service
- How Inventory is Managed in Ghana Health Service
- The Role of Inventory Management in Health Care Delivery

2.2 DEFINITION OF INVENTORY

Lysons and Gillingham (2003) in their book, *Purchasing and Supply Chain Management* (6th Edition), defined Inventory as an American accounting term for the value or quantity of raw materials, components, assemblies, consumables, work-in-progress and finished stock that are kept or stored for use as need arises.

Coyle et al (2003), defines Inventory as raw materials, work-in-progress, finished goods and supplies required for creation of a company's goods and services. The number of units and/or value of the stock of goods a company holds.

Rick Lavelly (1998), defines Inventory as piles of money on the shelf and profit for the company or organization.

According to an article written by Michael Pollick and edited by Lindsey D. (Wise GEEK, 22 May, 2011), Inventory is the total amount of commodities or materials contain in a storehouse or warehouse at a given time. The word "Inventory" can refer to both the total amount of commodities and the act of counting them.

The relevance of these theories to the study is that Inventory is to be seen as the largest investment in assets and represents one of the primary sources of revenue generation and subsequent earnings for an organization, therefore it has to be efficiently and effectively managed to reduce cost and increase profitability in the organization.

2.3 TYPES OF INVENTORY

Stock and Lambert (2001), categorized inventories into six main types, namely:

Cycle Stock is the inventory that results from the replenishment process and is required in order to meet demand under conditions of certainty. That is when the firm can predict demand and replenishment times (lead times) perfectly.

In-Transit Inventory (Pipeline) is the inventory that is en route from one location to another. It may be considered part of cycle stock even though it is not available for sale and or shipment until after it arrive at the destination.

Safety or Buffer Stock is the stock held in excess of cycle stock because of uncertainty in demand or lead time. The notion is that a portion of average inventory should be devoted to cover short-range variations in demand and lead time.

Speculative Stock is inventory held for reasons other than satisfying current demand. That is inventories purchased as a result of speculations of price hikes.

Seasonal Stock is a form of speculative stock that involves the accumulative of inventory before a season begins in order to maintain a stable labour force and stable production runs or in the case of agriculture products, inventory accumulated as a result of a growing season that limits availability throughout the year.

Dead (obsolete) Stock is the set of items for which no demand has been registered for some specified period of time. They are out of date, deteriorated or no longer useful as a result of advancements in technology.

2.4 REASONS FOR HOLDING INVENTORY

Stock and Lambert (2001), outlined five reasons for holding inventory.

The first is to enable the firm achieve economies of scale. Inventory is required if a firm is to realize economies of scale in purchasing, transportation, and manufacturing.

Secondly, it balances supply and demand. Seasonal supply and/or demand may make it necessary for a firm to hold inventory.

Thirdly, inventory enables specialization in manufacturing. Inventory makes it possible for each of a firm's plants to specialize in the products that it manufactures.

Fourthly, it provides protection from uncertainties in demand and order cycle.

Inventories in excess of those required to support production can result from speculative purchases made because management expects either a future price increase or a strike, for example.

Finally, inventory acts as a buffer between critically interfaces within the supply chain. Since members of the supply chain are separated geographically, it is necessary for inventory to be held throughout the supply chain in order to successfully achieve time and place utility. Though these reasons for holding inventory are very good and important for organizations, holding of inventory still draws some skepticism.

Ballou (1999), lists three reasons why holding inventories draws skepticism.

The first is that inventories are considered wasteful because they absorb capital that might otherwise be put to good use.

Secondly, inventories held, if not properly stored can result in deterioration of otherwise high quality products leading to poor customer satisfaction and loss of revenue.

Thirdly, according to Ballou, why holding inventories draws skepticism is that keeping inventories promotes insular attitudes within the entire logistics chain.

These theories are relevant to this study in that it suggests that though inventory is important in an organization, it must be properly managed to avoid wastage and deterioration, since the capital used in the procurement of inventory can otherwise be used profitably.

2.5 DIFFERENT PERSPECTIVES OF INVENTORY MANAGEMENT

According to In Net We Trust (www.inventorymanagement.com, 6 January 2012), inventory management is primarily about specifying the size and placement of stocked goods. It is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods.

Lysons and Gillingham (2003), identified three main aims of inventory management as

- To provide both internal and external customers with the required service levels in terms of quantity and order rate fill.
- To ascertain present and future requirements for all types of inventory to avoid both overstocking and bottlenecks in production.
- To keep costs to a minimum by variety reduction, economical lot sizes and analysis of costs incurred in obtaining and carrying inventories.

Stock and Lambert (2001), states that the objectives of inventory management are to increase corporate profitability, to predict the impact of corporate policies on inventory levels, and to minimize the total cost of logistics activities.

James Healy (1998), highlights that distributors carry Ten to Thirty percent (10-30%) of additional inventory that is unnecessary. These cause unnecessary carrying cost, loss of customers, loss of sales, and loss of profit due to sloppy and inefficient inventory management. He further points out that there is the need to set out procedures to control physical inventory, to determine the true cost of managing inventory.

He therefore argues that the purpose of inventory management is to facilitate shop operation by reducing the amount of time that goods are kept on the shelf (rack time), thus increasing gross profit.

The relevance of these theories to this study is that it reveals that holding unnecessary stock of commodities adds to the operational cost of any organization and therefore reduces profit. Organizations should therefore adopt efficient inventory management techniques and procedures to ensure that the right quantity and quality of commodities are available when and where they are needed.

2.6 INVENTORY MANAGEMENT TECHNIQUES

Inventory management relates to the tracking and management of commodities which includes the monitoring of commodities moved into and out of stockroom locations and the reconciling of the inventory balances.

Some of the techniques used in managing inventories were discussed below:

2.6.1 ABC ANALYSIS

This technique assigns items to three groups according to the relative impact or values of the items that makes up the group. Those thought to have the greatest impact, or value, for example, constituted the 'A' group, while those items thought to have a lesser impact or value were contained in the 'B' and 'C' groups respectively. (Coyle et al (2003)).

In many ABC analysis, a common mistake is to think of the 'B' and 'C' items as being for less important than the 'A' items and, subsequently, to focus most or all of management's attention on the 'A' items. A decision might be made to assume very high in-stock levels for the 'A' items and little or no availability for the 'B' and 'C' items. The fallacy here relates to the fact that all items in the A, B and C categories are important to some extent and that strategy to assure availability at an appropriate level of cost.

The purpose of this classification is to ensure that purchasing staff use resources to maximum efficiency by concentrating on those items that have the greatest potential savings. Selective control will be more effective than an approach that treats all items identically. (Lysons and Gillingham (2003)).

The relevance of this theory to this study is that it suggests that though all categories of inventory is important, inventory must be categorized or classified in accordance to their relative impact or value and treated differently.

2.6.2 ECONOMIC ORDER QUANTITY (EOQ)

Dave Plasecki (2001), defines Economic Order Quantity as an accounting formula that determines the point at which the combination of order costs and inventory costs are the least.

Lysons and Gillingham (2003), also defines Economic Order Quantity as the optimal ordering quantity for an item of stock that minimizes cost.

According to Lysons and Gillingham, to calculate the Economic Order Quantity, a mathematical model of reality must be constructed. All mathematical models make assumptions that simplify reality. The model is valid only when the assumptions are true or nearly true. When an assumption is modified or deleted, a new model must be constructed.

Economic Order Quantity approaches have proven to be effective inventory management technique when the demand and lead time are relatively stable, as well as when significant variability and uncertainty exist.

This theory is relevant to this study in that it suggests that the appropriate or optimum level of stock or inventory that an organization should keep or store must help to reduce the cost of doing business.

2.6.3 MATERIAL REQUIREMENT PLANNING (MRP I)

Ballou (1999), defined material requirement planning as a mechanical method of supply scheduling where the timing of purchase or of production output is synchronizing to meet period by period operations requirement.

Ballou (1999), explained further that material requirement planning methods try to avoid carrying more inventory than is needed at a time. Thus the emphasis is on carrying only the quantities of stock needed at any point in time, and this is achieved through precise timing of material flows to meet requirements.

Lysons and Gillingham (2003), defined material requirement planning as a product-oriented computerized technique aimed at minimizing inventory and maintaining delivery schedules. It relates the dependent requirements for the materials and components comprising an end product to time periods known as 'buckets' over a planned horizon (typically one year) on the basis of forecasts provided by marketing and sales and other input information.

Coyle et al (2003), explained material requirement planning as a set of logically related procedures, decision rules, and records designed to translate a master production schedule into time-phased net inventory requirements for each component item needed to implement this schedule.

Lysons and Gillingham (2003), outlined the aims of material requirement planning as follows:

- To synchronize ordering and delivery of materials and components with production requirements.
- To achieve planned and controlled inventories and ensure that required items are available at the time of usage or not much earlier.
- To promote planning between the purchaser and the supplier to the advantage of each.

- To enable rapid action to be taken to overcome material or component shortage due to emergencies, late delivery and so on.

Coyle et al (2003), also explained the goals of material requirements planning as follows:

- Ensure the availability of materials, components and products for planned production and for customer delivery.
- Maintain the lowest possible inventory level.
- Plan manufacturing activities delivery schedule, and purchasing activities.

In doing so, the material requirement planning system considers current and planned quantities of parts and inventory products, as well as the time used for planning.

2.6.4 MANUFACTURING RESOURCE PLANNING (MRP II)

Manufacturing resource planning (MRP II), has been defined by the American Production and inventory Control Association as a system built around materials requirement planning and also including the additional planning functions of production planning, master production scheduling and capacity requirement planning.

Lysons and Gillingham (2003), explained that, manufacturing resource planning (MRP II) has wider implications than material requirements planning (MRP I).

Stock and Lambert (2001), also explained that, material requirements planning (MRP I) developed into manufacturing resource planning (MRP II) with the addition of financial, marketing and purchasing components.

According to Coyle et al (2003), manufacturing resource planning (MRP II) allows a firm to integrate financial planning and operations/logistics. They further explained that

manufacturing resource planning (MRP II) serves as an excellent planning tool, and it helps describe the likely results of implementing strategies in areas such as logistics, manufacturing, marketing, and finance. Thus, it helps a firm to conduct “what if?” analysis and to determine appropriate product movement and storage strategies at and between points in the firm’s logistics system.

Both material requirements planning (MRP I) and manufacturing resource planning (MRP II) are relevant to this study in that they place emphasis on carrying quantities of stock that is needed at any point in time and avoid unnecessary stock. This therefore helps reduce holding or carrying cost.

2.6.5 ENTERPRISE RESOURCE PLANNING (ERP)

Stock and Lambert (2001), explained that Enterprise resource planning (ERP) is a system that includes the core accounting functions of accounts payable, accounts receivable, and general ledger, coupled with logistics functions, to manage the organization.

Lysons and Gillingham (2003), defines Enterprise resource planning (ERP) as a business management system that, supported by multi-module application software integrates all the departments of functions of an enterprise.

Lysons and Gillingham, further explained that Enterprise resource planning (ERP) is the latest and possibly the most significant development of material requirement planning (MRP I) and manufacturing resource planning (MRP II). While MRP I and MRP II allowed manufacturers to track supplies, work in progress and the output of finished goods to meet sales orders, ERP is applicable to all organizations and allows managers

from all functions or departments to have a consolidated view of what is, or is not taking place throughout the enterprise.

2.6.6 DISTRIBUTION RESOURCE PLANNING (DRP)

Lysons and Gillingham (2003), defined Distribution Resource Planning as an inventory control scheduling technique that applies material requirements planning principles to distribution inventories. It may also be regarded as a method of handling stock replenishment in a multi-echelon environment.

Vollman et al (1988), observed that Distribution resource Planning (DRP) serves a central role in co-coordinating the flow of goods inside the factory with the system modules that place goods in the hands of the customers, and provides the basis for integrating the manufacturing resource planning (MRP II) system from the firm to the field.

According to Coyle et al (2003), Distribution resource planning is a widely used and potentially powerful technique for outbound logistics systems to help determine the appropriate level of inventory. They further explained that, DRP helps companies to improve customer service (decrease stock out situations), reduce the overall level of finished goods, and improve distribution center operations.

The underlying rationale for Distribution resource planning (DRP) is to more accurately forecast demand and to explode that information back for use in developing production schedules. In that way, a company can minimize inbound inventory by using material requirements planning (MRP) in conjunction with production schedules. Outbound

inventory is minimized through the use of Distribution resource planning (MRP). (Coyle et al, 2003).

The relevance of this theory to this study is that it suggests that inventory quantities are determined by comparing inventory status with the total number of items needed to meet the production schedule.

2.6.7 JUST-IN-TIME SYSTEM (JIT)

Coyle et al (2003), defined Just-In-Time (JIT) System as an inventory control system that attempts to reduce inventory levels by coordinating demand and supply by the point where the desired item arrives just in time for use. Ideally, products should arrive exactly when a firm needs it, with no tolerance for late or early deliveries.

Lysons and Gillingham (2003), also defined Just-In-Time System as an inventory control philosophy whose goal is to maintain first enough material in just the right place at just the right time to make just the right amount of product.

It is a lean production system used mainly in repetitive manufacturing. The Just-In-Time System suggests that inventories should be available when an organization needs them, not any earlier, nor any later.

Stock and Lambert (2001), defined Just-In-Time System as a program which seeks to eliminate non-value-added activities from any operation with objectives of producing high-quality products, high productivity levels, lower levels of inventory, and developing long-term relationships with channel members.

Stock and Lambert, further explained that in Just in time (JIT) System, anything over the minimum amount necessary for a task is considered wasteful. Thus, Just-In-Time (JIT) attempts to minimize inventories through the elimination of safety stock.

This theory is relevant to this study because it focuses on the identification and elimination of manufacturing system. This therefore helps to eliminate unnecessary inventory and reduce cost throughout the entire supply chain system.

Of the techniques to inventory management discussed above, ABC Analysis seek to categorize all inventory in accordance to relative impact and value, so that the more value placed on an item, the more of that particular item held in stock.

The Economic Order Quantity (EOQ), focuses more on minimizing inventory cost rather than minimizing the inventory itself.

Material Requirement Planning (MRP I), Manufacturing Resource Planning (MRP II) and Enterprise Resource Planning (ERP) try to manage inventory by avoiding unnecessary inventory, and place more emphasis on only needed stock.

Distribution resource planning (DRP) avoids unnecessary inventory and also compare inventory status with the total number of items needed to meet operational schedule.

The Just-In-Time (JIT) System ties to eliminate waste by maintaining just enough inventories at the right place at the right time to make just the right amount of product.

All these inventory management techniques discussed above reveals that carrying unnecessary stock of goods and materials adds to the operational cost of the organization and therefore reduces its profitability. Therefore, the solution to reducing overall cost of

holding inventory lies with adopting the use of efficient procedures to manage and control physical inventory of goods. Thus, the organization must invest thoroughly in ensuring that the right stock is available when and where it is needed. This helps to reduce the loss of sales opportunities and thereby improve upon the profitability of the organization.

2.7 IMPORTANCE OF INVENTORY TO AN ORGANISATION

Inventory management is concerned with every aspect of the movement or flow of commodities in an organization. This is to be done by:

- Eliminating handling wherever possible.
- Minimizing travel distance.
- Providing uniform flow free of bottlenecks.
- Minimizing losses from waste, breakage, spoilage, and theft.

An organization incurs costs every time an item is handled. Since handling generally adds no value to a product or service, it should be kept to a lowest minimum. By carefully analyzing material flows, inventory management can save an organization significant amount of money.

Inventory is a major use of capital and for this reason; efficient inventory management is to increase organizational profitability, to predict the impact of organizational policies on inventory levels, and to minimize the total cost of logistics activities.

Stock and Lambert (2001), explained that, corporate profitability can be improved by increasing sales volume or cutting inventory costs. Increased sales are often possible if high levels of inventory lead to better in-stock availability and more consistent service levels. Low inventory levels can reduce fill rates on customer orders and result in lost sales.

Stock and Lambert, further explained that, better inventory management can increase the ability to control and predict the reaction of inventory investment to changes in management policy. Therefore, inventory managers must determine how much inventory to order and when to place the order.

Chopra and Meindl (2003), explained that inventory exists in an organizational operation because of the mismatch between supply and demand. Therefore, inventory's role is to increase the amount of demand that can be satisfied by having the product or service ready and available when the customer wants it.

Another important role inventory plays is to reduce cost by exploiting economies of scale that may exist during production and distribution, but managers should use actions that lower the amount of inventory needed without increasing cost.

Chopra and Meindl (2003), suggests that since inventory plays a significant role in a supply chain's ability to support a firm's competitive strategy and that the firm's competitive strategy requires very high level of responsiveness, a company can achieve this responsiveness by locating large amounts of inventory close to the customer.

Another very important role that inventory plays in an organization is to avoid stock-out costs (the costs of being out of inventory). This is very important to all organizations, especially in the healthcare delivery where delay by a few seconds can cost a life.

2.8 CONCEPT OF HEALTH SYSTEMS

The World Health Organization (WHO), defines health systems as “all the organizations, institutions, and resources that are devoted to producing health actions”. This definition includes the full range of players engaged in the provision and financing of health services including the public, nonprofit, and for-profit private sectors as well as international and bilateral donors, foundations and voluntary organizations involved in funding or implementing health activities.

Health systems encompass all levels: central, regional, district, community, and household. Health sector projects engage with all levels and elements of the health system and frequently encounter constraints that limit their effectiveness.

The World Health Organization Report 2000 (WHO 2000), identifies the four key functions of the health system as follows:

- Stewardship (often referred to as governance or oversight).
- Financing
- Human and Physical resource
- Organization and management of service delivery.

2.8.1 STEWARDSHIP (GOVERNANCE)

The stewardship or governance function reflects the fact that people entrust both their lives and their resources to the health system. The government in particular is called upon to play the role of a steward, because it spends revenues that people pay through taxes and social insurance, and because government makes many of the regulations that govern the operation of health services in other private and voluntary transactions (WHO 2000).

The government exercises its stewardship function by developing, implementing, and enforcing policies that affect the other health system functions. The World Health Organization has recommended that one of the primary roles of a ministry of health is to develop health sector policy, with the aims of improving health system performance and promoting the health of the people (WHO 2000).

2.8.2 HEALTH FINANCING

Health financing is a key determinant of health system performance in terms of equity, efficiency, and quality. Health financing encompasses resource mobilization, allocation and distribution at all levels, including how providers are paid.

Schieber and Akiko (1997), defined health financing as “the methods used to mobilize the resource that support basic public health programs, provide access to basic health services, and configure health service delivery systems”.

By understanding how the government health system and services are financed, programs and resources can be better directed to strategically complement the health financing

already in place, advocate for financing of needed health priorities, and aid populations to access available resources. Many health sector programs are involved in strengthening health financing systems by mobilizing resources, advocating how resources should be allocated and configuring health service delivery.

Health systems in developing countries are financed through a mix of public, private, and donor sources.

2.8.3 HUMAN AND PHYSICAL RESOURCE

The third function of the health system is the recruitment, training, development, and retention of qualified human resources, the procurement, allocation, and distribution of essential medicines and medical supplies, and investment in physical health infrastructure such as facilities, equipment, and so on.

The World Health Organization (WHO 2000), noted that human resources are the most important part of a functional health system.

Recently, attention has focused on the fact that progress towards health related Millennium Development Goals (MDGs) is seriously impeded by a lack of human resources in health, with serious implications for child survival and health goals.

For government health workers, evidence shows that effective public management can contribute to improve performance of workers. New public sector management philosophy calls for responsibilities to be delegated to local areas with responsibility for specific tasks and decision making at the local level, a focus performance (output and

outcomes), a client orientation, and rewards or incentives for good performance (World Bank 2004).

2.8.4 ORGANIZATION AND MANAGEMENT OF HEALTHCARE DELIVERY

This health system function includes a broad array of health sector components, including the role of the private sector, government contracting of services, decentralization, quality assurance, and sustainability.

2.8.4.1 THE PRIVATE SECTOR

Mills et al (2002), defined private health sector to comprise “all providers who exist outside of the public sector, whether their aim is philanthropic or commercial, and whose aim is to treat illness or prevent disease”.

The private sector is a key source of health services, and its coverage is rapidly increasing. Use of government health services is too low to affect indicators such as child mortality without the contributions of private sector health services, including Non-Government Organizations’ services (WHO 2003).

2.8.4.2 CONTRACTING

Contracting of health service is instruments by which governments can take advantage of private sector resources in the health sector.

Contracting refers to any public purchasing or donor financing of services from private providers, both for-profit and nonprofit, and encompasses a broad spectrum of services. These services include, the direct provision of healthcare, the training of health providers, management services, and the education of communities and households.

2.8.4.3 QUALITY ASSURANCE

Quality assurance is a health system element that has grown in importance as costs of care have escalated and consumer awareness and demand for quality services have increased. Many studies demonstrate that rise of services and willingness to pay are strongly related to patient perceptions of quality. Improved health outcomes are closely linked to quality improvements.

2.8.4.4 DECENTRALIZATION

Government pursues decentralization to improve administrative and service delivery effectiveness, increase local participation and autonomy, redistribute power, and reduce ethnic and regional tensions. Decentralization is also used as a means of increasing cost efficiency, giving local units greater control over resources and revenues, and increasing accountability (Brinkerhoff and Leighton, 2002).

Decentralization deals with the allocation of political, economic, fiscal, and administrative authority and responsibility from the center to the periphery.

2.9 BRIEF HISTORY OF GHANA HEALTH SERVICE (G.H.S)

The Ghana Health Service (GHS) is a Public Service body established under Act 525 of 1996 as required by the 1992 constitution. It is an autonomous Executive Agency responsible for implementation of national policies under the control of the Minister for Health through its governing council – the Ghana Health Service Council. The Ghana

Health Service continue to receive public funds and thus remain within the public sector (GHS 5-year strategic framework for service delivery, July 2008).

However, its employees are no longer part of the civil service, and Ghana Health Service managers will no longer be required to follow all civil service rules and procedures. The independence of the Ghana Health Service is designed primarily to ensure that staffs have a greater degree of managerial flexibility to carry out their responsibilities, than would be possible if they remained wholly within the civil service. Ghana Health Service does not include Teaching Hospitals, Private and Mission Hospitals.

The establishment of the Ghana Health Service is an essential part of the Key strategies identified in the Health Sector Reform process, as outlined in the Medium Term Health Strategy (MTHS), which are necessary steps in establishing a more equitable, efficient, accessible and responsive health care system (GHS 5-year strategic framework for service delivery, July 2008).

The Ghana Health Service is mandated to provide and prudently manage comprehensive and accessible health service with special emphasis on primary health care at regional, district and sub-district levels in accordance with approved national policies.

The objectives of the Service are to:

- Implement approved national policies for health delivery in the country.
- Increase access to good quality health services, and
- Manage prudently resources available for the provision of the health services.

For the purpose of achieving its objectives the Ghana Health Service will perform the following functions amongst others:

Provide comprehensive health services at all levels directly and by contracting out to other agencies.

As a result decentralization and health sector reform; services are integrated as one goes down the hierarchy of health structure from the national to the sub-district.

At the regional level, curative services are delivered at the regional hospitals and public health services by the District Health Management Team (DHMT) as well as the Public Health Division of the regional hospital. The Regional Health Administration or Directorate (RHA/RHD) provides supervision and management support to the districts and sub-districts within each region.

At the district/municipal level, curative services are provided by the DHMT and the Public Health unit of the district hospitals. The District/Municipal Health Administration or Directorate (DHA/DHD) provides supervision and management support to their sub-district.

At the sub-district level both preventive and curative services are provided by the health centers as well as out-reach services to the communities within their catchment areas. Basic preventive and curative services for minor ailments are being addressed at the community and household level with the introduction of the Community-based Health Planning and Services (CHPS). The role played by the traditional birth attendants (TBAs) and the traditional healers is also receiving national recognition (GHS 5-year strategic framework for service delivery, July 2008).

Volta Region (Volta Regional Health Directorate) has a total of 326 health institutions out of which 242 are Ghana Health Service administered ones(under the supervision of

Volta Regional Health Directorate), 18 are Mission owned, One facility is quasi-government (that is the military hospital MRS) at the 66 Artillery regiment in Ho, and 65 privately owned. It is worth noting that many of the Ghana Health Service run health centers were community initiated. In exception of Krachi East, Nkwanta North and Adaklu Anyigbe, every district now has a hospital either government or mission owned (Volta Regional Health Directorate, 2010 Annual Report).

2.10 MANAGEMENT OF INVENTORY IN THE GHANA HEALTH SERVICE

Inventory management systems obtain and move supplies and equipment to places where they are needed in a timely manner and at an optimum cost. Supplies and equipment usually cannot go directly from their source to the end user. They frequently must be held in the warehouse at some points along the way.

In view of this warehouse of supplies maintained and inventory of supplies and equipment are held at all levels in the Ghana Health Service (GHS). The inventory management system recognizes that staffs at all levels have a wide range of responsibilities.

Access to essential medicines and supplies is fundamental to the good performance of the medicines and supplies is commonly cited as the most important element of quality by healthcare consumers and the absence of medicines and supplies is a key factor in the underuse of government health services.

At the national level, health commodities are procured from three sources namely;

- Manufacturers of pharmaceuticals and medical goods on the international market.
- Private supplies on the local market.
- International organizations.

All commodities procured at the national level are therefore stored at the Central Medical Stores (CMS), Tema. The Tertiary Hospitals, Regional Medical Stores and even private sector suppliers then get their supplies from the Central Medical Stores.

At the regional level, health commodities are procured from two sources namely;

- Central Medical Stores (CMS)
- Private Suppliers on the local market

All commodities procured at the regional level are then stored at the various Regional Medical Stores (RMS) situated in all the ten (10) regional capitals in the country.

Hospitals and other facilities in the various regions also procure from the two sources where the regional level procurements are done, but these are done by first visiting the Regional Medical Stores (RMS), and if they are not able to obtain their requirements, they are then given a non-availability certificate which allows them to go ahead and do their purchase outside the RMSs.

Therefore, in the Ghana Health Service (GHS), after the commodities have been procured, they are transported and stored in a number of intermediate facilities at different levels before reaching the health facilities where they are dispensed to clients.

2.11 ROLE OF INVENTORY MANAGEMENT IN HEALTHCARE DELIVERY

An important role that inventory plays in the supply chain is to increase the amount of demand that can be satisfied by having product readily available when the customer needs it.

Quality care cannot be provided on time unless required material is available in adequate quality. Inventory management plays a crucial role in providing efficient healthcare in relation to three vital aspects of medical supplies used in the health facilities; availability, safety, and affordability.

2.11.1 Timing: The Most Crucial Aspect.

The time factor is probably not as crucial in any other field as it is in healthcare delivery, where delay by a few seconds can cost a life. Therefore, inventory managers have the huge responsibility of making thousands of diverse health commodities available on time.

The challenge is even greater as the number of expected patients is unpredictable, suppliers are unreliable and costs are rising.

2.11.2 Patient safety: The first priority

The safety of patient is the top priority in healthcare, and inventory managers play a crucial role in protecting their intent. The biggest responsibility of an inventory manager is to ensure that the commodities purchased for clinical use are of good quality. Despite cost being an important criterion in assessing commodities, safety and clinical efficacy concerns are prioritized. Inventory managers also need to ensure that stocked commodities are well within the expiry period.

2.11.3 Cost (Affordability): An important variable.

There is tremendous pressure on inventory managers to initiate serious cost cutting measures. While the cost of medical supplies has been spiraling up, greater numbers of patient are demanding high quality and reasonably priced healthcare services. Since cost of supplies form significant portion of healthcare expense, inventory managers should continuously strive to get better deals. Economical prices help ensure affordable healthcare for vast majority. The healthcare facility in turn reaps the benefit of better revenue realization stemming from increase number of patients.

The medical supplies industry is flooded with innovative products and services. Inventory managers should continuously scout for competitive alternative product/technique that can give better outcome. While cost is an important criterion, quality of the product needs to be the primary concern to ensure that patient care is not compromised.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter addresses the research design employed to investigate the research topic. It focuses on the population and the characteristics of the sample.

Furthermore, the procedure and measuring instrument used to gather the data were discussed. Finally, the statistical techniques used for data capture, analysis and presentation were also discussed.

3.2 RESEARCH DESIGN

Exploratory design was adopted in carrying out the study, since the association of inventory management in relation to healthcare delivery is not conclusively known.

Exploratory design was used because, it enabled the researcher to explore new experiences, techniques, and collaborations in inventory management in providing healthcare delivery and gave the researcher the ability to arrive at new innovative results.

3.3 THE STUDY AREA

The study focuses on how inventory is managed at the Ghana Health Service facilities in the Ho municipality, and how these facilities use the inventory to provide service to their clients. The facilities are the Regional Health Directorate; the Regional Medical Stores;

the Municipal Health Directorate; the Public Hospitals, the Polyclinic; Public Health Centers; Clinics; Maternity Homes; Reproductive and Child Health Centers; and Community-Based Health Planning Services (CHPS zones).

3.4 POPULATION AND SAMPLING TECHNIQUES

The population refers to the entire group of people from which data can be sourced and investigated and from which the researcher can make references.

With reference to the scope of this study, the population consisted of healthcare providers in Ghana Health Service facilities (Doctors, Nurses, Pharmacists/Pharmacy Technicians, Biomedical Scientists/Laboratory Technicians, and Medical Assistants); inventory managers (Store Managers, Supply Officers, and Storekeepers); and healthcare receivers (clients or patients that visit the health facilities).

The researcher adopted the stratified sampling method to choose the respondents. The respondents were divided into three (3) strata in order to ensure that each was appropriately represented in the survey sample.

Stratum 1, comprised the inventory managers.

Stratum 2, comprised the healthcare providers.

Stratum 3, comprised the healthcare receivers.

Probability sampling was used in the selection of the health facilities, to eliminate as far as possible, biases in the choice of the sample.

3.5 DATA COLLECTION PROCEDURE

In the conduct of this study, the questionnaire (survey) method was adopted. This method enabled the collection of a large amount of data on the variables that were considered important to the research. Furthermore, questionnaire survey afforded the respondents the privilege of anonymous settings.

The respondents interviewed were selected from all the four (4) hospitals; regional medical stores, Ho municipal health directorate; six (6) health centers; three (3) clinics; three (3) maternity homes; two (2) CHPs zones; and three (3) reproductive child health centers.

Simple random sampling method was used to select the facilities and the respondents. To meet the interest of the researcher, seventy-eight (78) people were selected for the study. These comprised of three (3) doctors; two (2) medical assistants; fifteen (15) nurses/midwives; five (5) pharmacists/pharmacy technicians; five (5) biomedical scientists/laboratory technicians; eighteen (18) inventory managers; and thirty (30) healthcare receivers (clients).

The sample represented a subset of the population and gave a fair and equal opportunity to every population element of being selected for the study.

The purpose of the research was explained to every respondent. They were also informed that participation was voluntary and that the results would be used for academic purposes. Furthermore, respondents were assured that all responses would remain confidential.

3.6 RESEARCH INSTRUMENT

The data was collected by means of questionnaires. Questionnaires were used because it was relatively more economical and convenient for the respondents to answer.

Secondly, it encouraged the provision of a true and honest response on sensitive issues.

The questionnaires afforded the researcher the opportunity to collect information that was not readily available, which tend to enrich the answers and that enhanced the eventual results of the study.

Three different set of questionnaires were used for the study.

- The first set of questionnaires was given to inventory managers.
- The second set of questionnaires was for healthcare providers.
- The third set was given to the healthcare receivers (clients).

This was to allow the researcher to get good responses from the different group of respondents.

Again, personal interviews were done for respondents who do not had time to answer the questionnaires and especially healthcare receivers (clients) who cannot read and/or write.

3.7 DATA ANALYSIS

The raw data was captured using the Statistical Package for Social Sciences (SPSS), presented and analyzed using descriptive statistics such as frequency distribution and

percentages. The researcher used these methods because they provided better explanation of the data collected succinctly.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

OVERVIEW

This chapter covers the results and discussions of data collected through questionnaires administered to inventory managers, healthcare providers, and the healthcare receivers at the health facilities in the Ho municipality.

Three different sets of questionnaires were administered in this study, namely;

- Inventory managers' questionnaire.
- Healthcare providers' questionnaire.
- Healthcare receivers (clients) questionnaire.

The results and discussions of questionnaires are presented below. Firstly, the results for age, sex, and marital status for all respondents were discussed, after which the three sets of questionnaires were discussed in sequence, starting with inventory managers; healthcare providers; and lastly, the clients.

4.1 INVENTORY MANAGERS

This section describes the background characteristics of all Inventory Managers.

4.1.1 AGE, SEX, AND MARITAL STATUS OF INVENTORY MANAGERS

Majority of the respondents who took part in the survey were males (66.7%).

Out of the 18 respondents, 12 representing 66.7% were married, 5 have not married before, and 1 representing 5.5% was separated. All respondents were between the ages of 20 to 59, indicating that the respondents are very active. See table 4.1 below for details.

Table 4.1 Distribution of Respondents by Age, Sex and Marital Status

Marital Status	Age Group	Sex		Total	Percentage (%)
		Male	Female		
Never Married	20 – 29	0	2	2	27.8
	30 – 39	1	2	3	
Married	20 – 29	0	1	1	66.7
	30 – 39	3	1	4	
	40 – 49	5	0	5	
	50 – 59	2	0	2	
Seperated	50 – 59	1	0	1	5.5
Total		12	6	18	100

Source: Field survey, May, 2012

4.1.2 POSITION IN THE ORGANIZATION

Out of the 18 inventory managers, 11 (61.1%) were officers in the supply chain profession (Storekeepers, Supply officers and Inventory managers). This indicates that majority of the respondents are professionals in the field, as shown in table 4.2 on next page.

Table 4.2 Distribution of Respondents by Position in Organization

Position in Organization	Number of Respondents	Percentage (%)
Accounts Officer	1	5.55
Asst Chief Pharmacy Technician	1	5.55

Biomedical Scientist	1	5.55
Community Health Nurse	1	5.55
Dispensing Assistant	1	5.55
Inventory Manager	1	5.55
Pharmacist	2	11.10
Principal Storekeeper	1	5.55
Principal Supply Officer	1	5.55
Senior Storekeeper	1	5.55
Senior Supply Officer	2	11.10
Supply Officer	5	27.80
Total	18	100

Source: Field survey, May, 2012

4.1.3 AGE, SEX, AND LEVEL OF EDUCATION OF INVENTORY MANAGERS

Majority (44.5%) of respondents for inventory managers were either ‘O’level, ‘A’level or SSS certificate holders. Six (6), representing 33.3%, were HND holders, while four (4) of the respondents, representing 22.2% were BA/BSc holders. Out of the 18 respondents, twelve (12), (66.7%) were males, with 6 (33.3%) as females. This indicates, majority of the respondents were energetic, their level of education were encouraging, as inventory management is mostly taught from the HND levels. Refer to table 4.3 in Appendix IV.

4.1.4 ROLES OF RESPONDENTS IN HEALTH COMMODITY MANAGEMENT

Sixty-five, point two percent (65.2%) of the respondents play the roles of inventory management, 17.4% as supervisors, 8.7% as procurement and 8.7% as users of the health

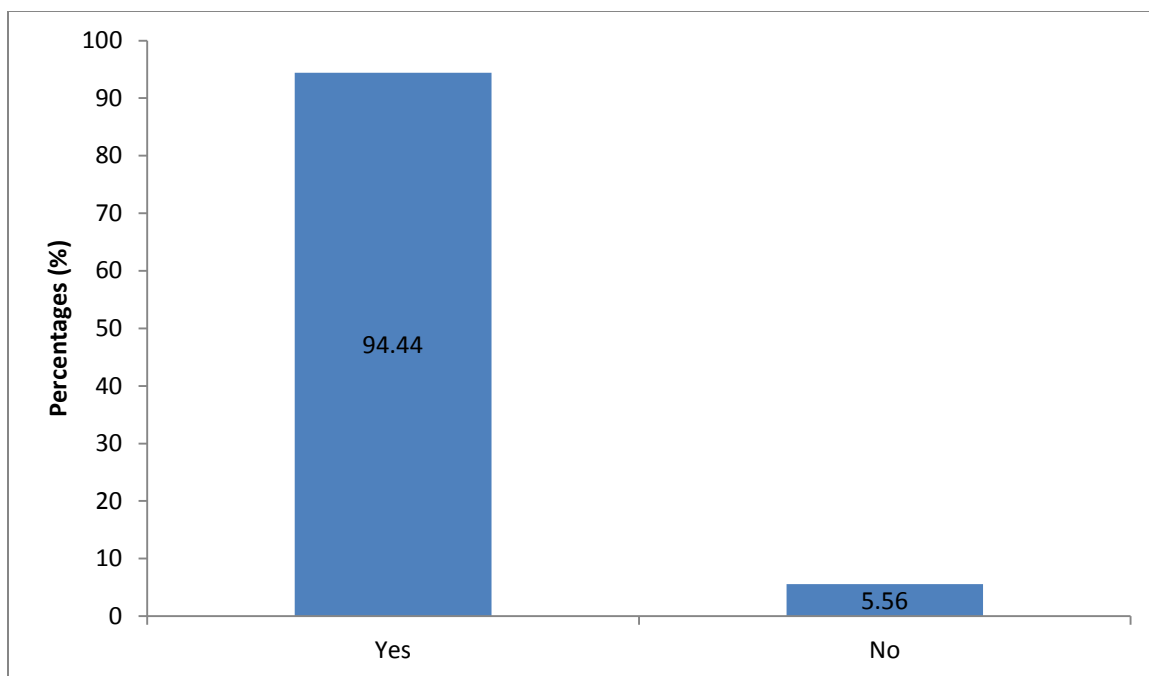
commodities. This therefore implies that, majority of the respondents were responsible for receiving, storing, controlling and distributing of the health commodities. Refer to Fig. 4.1 in Appendix IV.

4.1.5 NUMBER OF YEARS FOR WORKING IN COMMODITY MANAGEMENT

With regard to the number of years that respondents have worked in health commodity management, 9 (50%) have worked for over 6years, 3 (16.7%) have worked between 4 to 6years, 4 (22.2%) have worked between 1 to 3years, with only 2 (11.1%) of the respondents working for less than a year. The result therefore indicates that, majority of the respondents have experience in health commodity management, since twelve (12) of the respondents, representing 66.7% have worked for more than four (4) years as inventory managers.

4.1.6 DISTRIBUTION OF RESPONDENTS BY TRAINING IN HEALTH COMMODITY MANAGEMENT

Fig. 4.2 on next page, shows that only 1 (5.56%) respondent never had any form of training in health commodity management. This implies that, 94.44% of the respondents have had training in health commodity management. This therefore means majority of the respondents have been train in receiving, storing, controlling and distribution of health commodities.



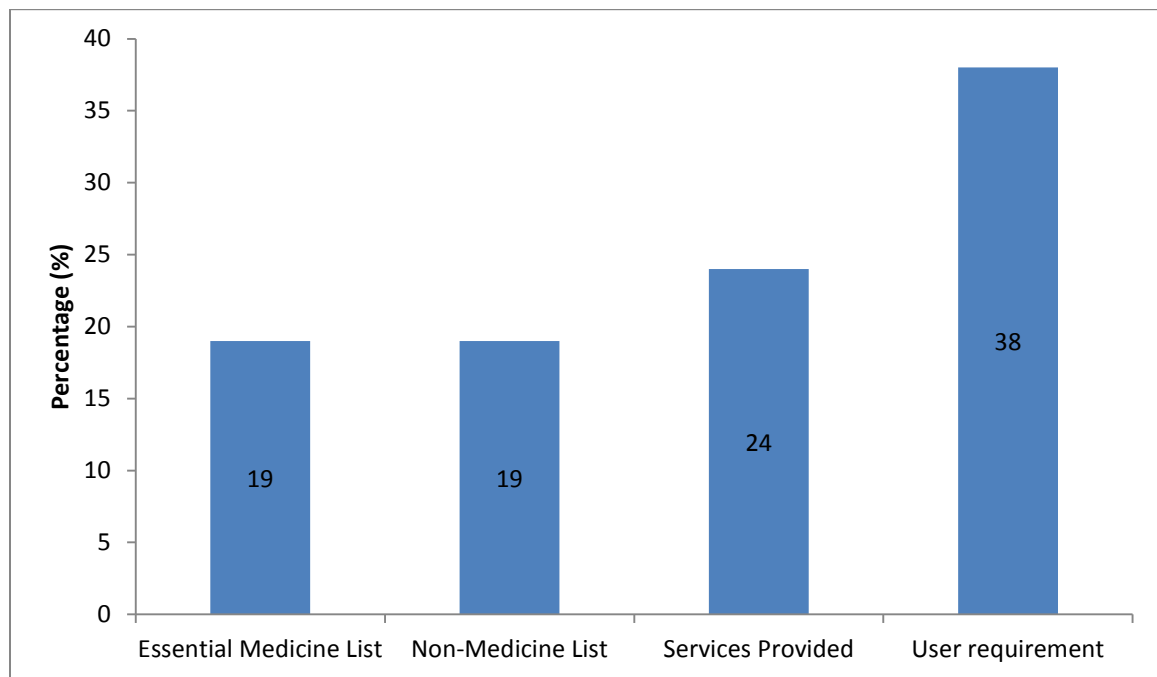
Source: Field survey, May, 2012

Fig. 4.2 Distribution of Respondents by Training in Health Commodity Management.

4.1.7 SELECTION OF HEALTH COMMODITIES IN FACILITIES

Most of the respondents (38%) depend on user requirements to select the health commodities for their facilities. 19% each uses the essential medicine list and non-medicine list respectively. Most of the respondents use almost all the multiple choice answers in selecting the commodities. This implies that, they use the essential medicine list and non-medicine list, they also depend on the services provided as well as the requirements from the users, this makes it possible to meet the policy requirements (essential medicine list and non-medicine list) and at the same time meet the requirements of the client (user requirement), as well as meet organizational policy

(services provided). See Fig. 4.3 below.



Source: Field survey, May, 2012

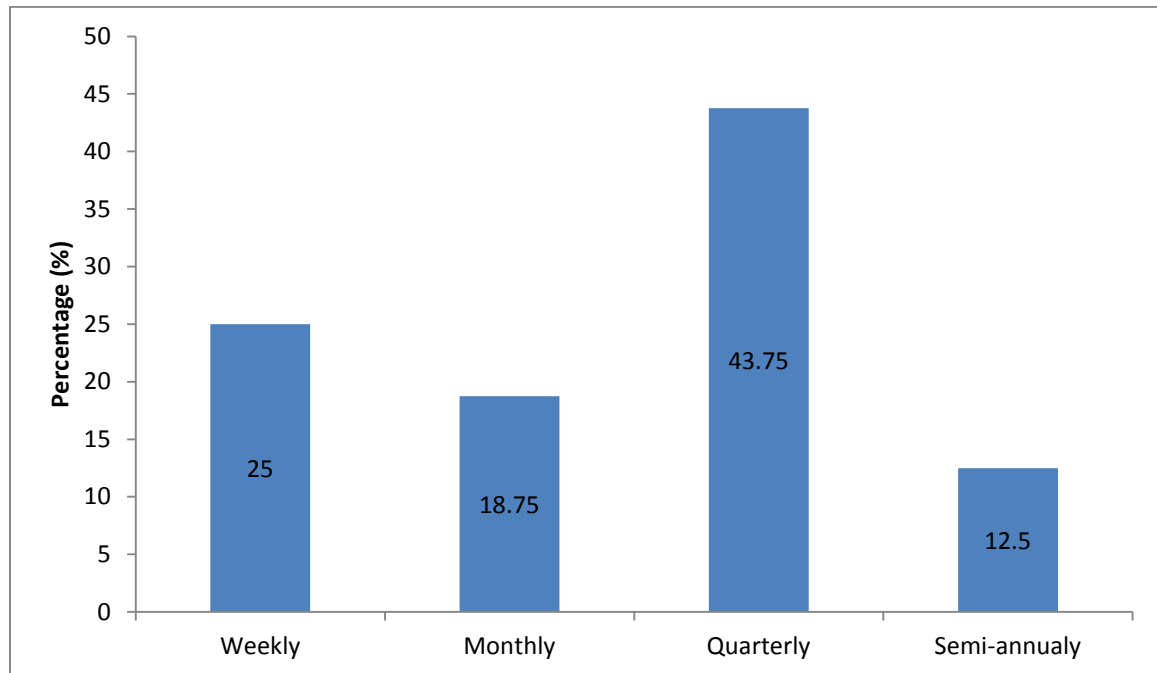
Fig. 4.3 Selection of Health Commodities in Facilities

4.1.8 ESTABLISHMENT OF MAX, MIN, AND RE-ORDER LEVELS

Sixteen (16) respondents representing 88.9% out of the 18 respondents said they establish maximum, minimum and re-order levels for all health commodities. This implies, majority of the respondents control their stock levels to help reduce or eliminate stock-outs, over-stocking and obsolete stocks. Refer to table 4.4 in Appendix IV.

4.1.9 UPDATE OF STOCK LEVELS

Majority of the respondents (43.75%) updates their stock levels quarterly, 25% weekly, 18.75% monthly and 12.55% semi-annually. See Fig. 4.4 below.



Source: Field survey, May, 2012

Fig. 4.4 Distribution of Respondents by Update of Stock Levels

4.1.10 STOCKTAKING

Sixteen (16) respondents representing 88.9% out of the 18 respondents said they do stocktaking for all health commodities. This implies, majority of the respondents take stock to compare their physical stock against the book balance to check whether there are discrepancies and to advise management on stock movement.

Fifty percent (50%) of the respondents do weekly stocktaking, 31.25% do quarterly stocktaking, with 12.5% and 6.25% doing semi-annually and monthly stocktaking respectively. Stock taking usually takes a lot of time, therefore weekly stocktaking may

hinder smooth stock management, since the officer may not have enough time for other equally important stock management activities.

4.1.11 RECORDS FOR COMMODITIES

All the 18 respondents maintain separate records for all health commodities in their facilities. This implies there will be easy tracking of transactions and easy location and identification of commodities.

4.1.12 DETERMINATION FOR QUANTITY OF COMMODITIES NEEDED

Majority of the respondents (72.22%) use their past consumption to determine the quantity of health commodities needed. 11.1% of the respondents use the request made by the users to determine their quantities. 5.56% each uses availability of funds, dispensed to user data, and seasonal variations respectively to determine the quantity of commodity needed. In stock management, the past consumption is what is used to calculate the stock control work sheet to get the stock levels (maximum, minimum and re-order). Refer to Fig. 4.5 in Appendix IV.

4.1.13 TYPE OF INVENTORY MANAGEMENT TECHNIQUE USED

Some respondents used more than one technique in inventory management of their commodities. 18 respondents were asked this question, but the responses were 21. This means 3 respondents use two different types of techniques. This implies that majority (47.64%) of the respondents use EOQ, which is a technique that suggests that the optimal level of inventory that an organization should keep must help to reduce the cost of doing business. 33.34% use ABC analysis, which suggests that though all categories of

inventory are important, inventory must be categorized or classified in accordance to their relative impact or value and treated differently. 19.02% of respondents use MRP technique which helps reduce holding cost. See table 4.5 below.

Table 4.5 Distribution of Respondents by Type of Inventory Technique Used

Technique	Number of Respondents	Percentage (%)
ABC Analysis	7	33.34
Economic Order Quantity	10	47.64
Material Requirement Planning	4	19.02
Total	21	100

Source: Field survey, May, 2012

4.1.14 SOURCES WHERE FACILITIES RECEIVE THEIR COMMODITIES

Only 5.6% of the respondents receive commodities from the District Directorate Store. No respondent receives commodities from a single source. The commodities are received from the Central Medical Store (CMS), the Regional Medical Store (RMS) or from Private Suppliers, depending on the commodity and its availability at the CMS or RMS. This implies that CMS and RMS are not able to meet facility's demands.

Majority of the respondents (66.7%) receives commodities between 2 to 4weeks after an order is placed. 27.8% of respondents receives their commodity in less than a week, while 5.5% receives commodities between 5 to 8weeks after an order has been placed. This implies, proper planning and stock control must be done to avoid stock-outs since the delivery lead-time is long.

4.1.15 EXPERIENCE OF STOCK-OUT

Fourteen (14), being (77.8%) of the respondents have experienced stock-out before, with only 4 (22.2%) of the respondents saying they have never experienced stock-out. This implies that the flow (distribution) of commodity from the source to facility is not the best, which therefore puts the lives of the clients at risk.

4.1.16 HOW STOCK-OUT SITUATION IS DEALT WITH

There were multiple responses (23) from the 14 respondents to this question.

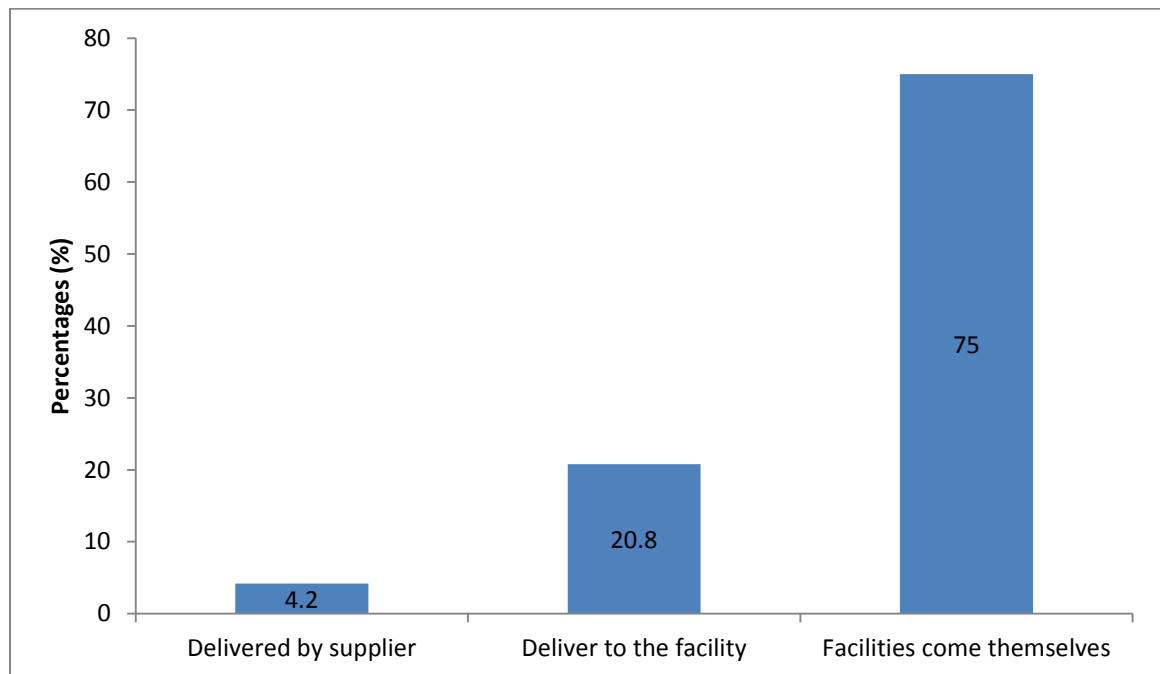
This implies that respondents have more than one way of dealing with such situations. 34.8% of respondents place an emergency order for the commodities that are out of stock, 4.3% ask the client to go and purchase the commodities from outside the facility (town), 26.1% borrow from other facilities, and 34.8% forward a requisition to CMS or RMS for the commodities. This situation therefore puts the clients at risk, since service delivery would be delayed.

4.1.17 WHEN ORDERED QUANTITIES ARE NOT MET

There were multiple responses (23) from the 18 respondents to this question. This implies that respondents have more than one way of dealing with such situations. Majority of the respondents (43.5%) said they contact other sources of supply for the commodities. 30.5% of the respondents, make requisitions to CMS and RMS for the rest of the commodities. 21.7% place emergency order for procurement, while only 1 (4.3%) waits and makes follow-ups to source of supply.

4.1.18 HOW COMMODITIES GET TO THE FACILITIES/CLIENTS

Again, there were multiple responses (24) from the 18 respondents to this question. This implies that some of the respondents have more than one way by which commodities gets to the facilities. Majority (75%) of respondents go for the commodities themselves, the commodities are delivered to 20.8% of respondents, while the suppliers deliver to only 4.2% of the respondents. This implies, 75% of the respondents (inventory managers) have to leave their jobs and travel long distances for health commodities. One may ask, what happens if commodities are needed for service delivery in their absence. See Fig. 4.6 below.



Source: Field survey, May, 2012

Fig. 4.6 How Commodities get to the Facilities/Clients

4.1.19 DETERMINATION OF QUANTITY OF COMMODITY TO BE ORDERED

Ten (10), being (55.6%) out of the 18 respondents said the head of the various departments or units, 6 (33.3%) respondents said the Stores and supplies unit of the facility, while the remaining 2 (11.1%) respondents said it is the procurement committee.

The respondents mentioned waybills; stores issue vouchers and receipts as some of the documents they use as evidence for inspecting commodities when they are receiving health commodities into the warehouses.

4.1.20 INSPECTION OF HEALTH COMMODITIES AT FACILITIES, AND THE STAGE AT WHICH IT IS DONE

Fourteen (14), being 77.8% of respondents do 100% inspection, with 4 (22.2%) of respondents doing random sampling inspection. Though it may be time consuming, majority of the respondents do thorough inspection for quality of health commodities that they receive into the warehouses.

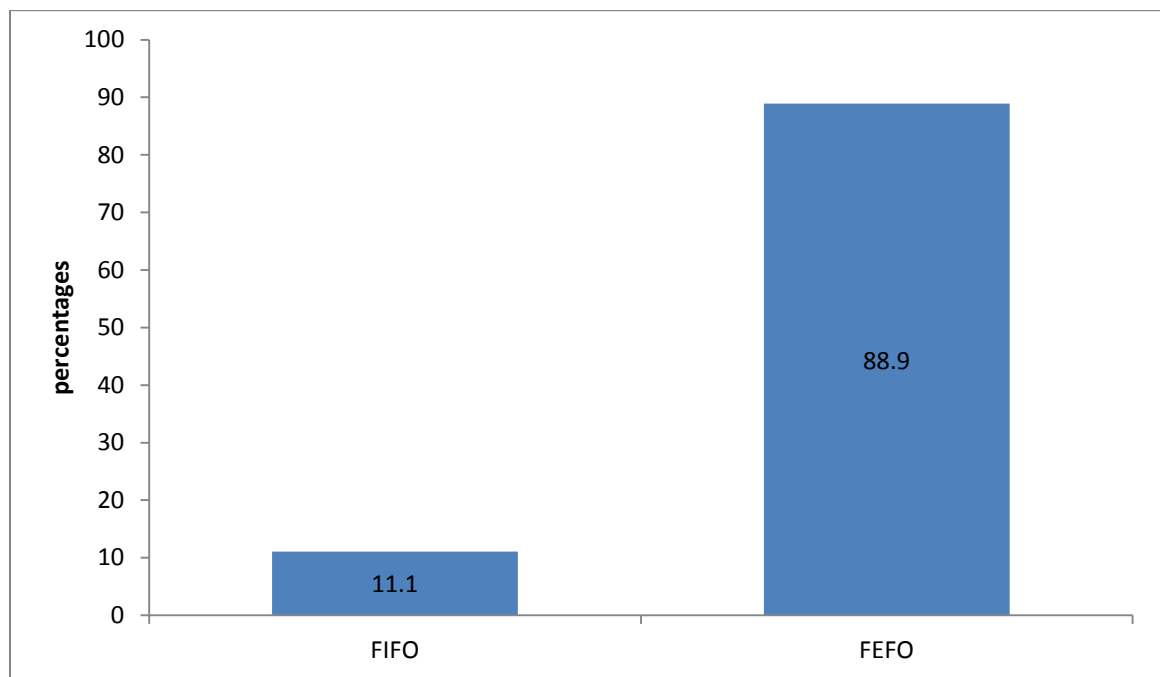
Majority (63.6%) of the respondents do the inspection of the commodities after the commodities have been unloaded from the vehicles. 22.7% of respondents inspect the commodities before storing them. 9.1% inspects the commodities before they are unloaded from the vehicles, while only 4.6% of the respondents do the inspection after the commodities have been stored in the warehouses.

4.1.21 LOCATIONS FOR QUARANTINE ITEMS

Sixteen (16) respondents (88.9%), have separate locations for quarantine commodities, with only 2 (11.1%) not having separate location for quarantine commodities. This implies, majority of the respondents have separate locations for usable and non-usable stocks. Refer to table 4.6 in Appendix IV.

4.1.22 METHODS BY WHICH COMMODITIES ARE STORED AND ISSUED

Out of the 18 respondents to this question, 2 representing 11.1% use the first in, first out (FIFO) method, while 16 (88.9%) respondents use the first expiry, first out (FEFO) method. This implies, irrespective of the arrival of the commodity, majority of the respondents issue out the one that has the date nearer to expiry first. This method helps to eliminate or reduce expired commodities in the system. See Fig. 4.7 below.



Source: Fieldsurvey, May, 2012

Fig 4.7 Methods by which Commodities are Stored and Issued

4.1.23 METHODS OF ISSUING COMMODITIES OUT OF THE WAREHOUSE

There were 23 responses from the 18 respondents.

Seventeen (17), being (73.9%) responses were for approved requisitions, while 6 responses (26.1%) were for approved distribution list.

This means that, before an issue is made there should be an approval from an authorized person. Also, depending on the type or purpose of commodity, a requisition or distribution list may be used.

4.1.24 GETTING HEALTH COMMODITIES READILY AVAILABLE AS AND WHEN NEEDED WITHOUT OVER STOCKING

There were 31 responses from the 18 respondents, with majority (32.3%) of the respondents saying there should be a periodic stock monitoring by management to check whether proper inventory management practices are adhered to. 22.6% of the respondents also said, there should be correct establishment of consumption levels (maximum, minimum and re-order). 19.4% also said, an effective scheduled delivery system, where the CMS and RMS must collate all requirements of all the facility and deliver the commodities to them as scheduled. 16.5% of the respondents also think that there must be accurate record keeping by all those who matters in commodity usage. See table 4.7 on next page.

Table 4.7 Getting Commodities Readily Available as and when Needed

Response	Number of respondents	Percentage (%)
Accurate record keeping	5	16.1
Establishment of consumption levels	7	22.6
Periodic stock monitoring	10	32.3
Effective schedule delivery system	6	19.4
Prompt response to request	1	3.2
Effective supervision of activities	1	3.2
Training of personnel responsible	1	3.2
Total	31	100

Source: Field survey, May, 2012

4.2 HEALTHCARE PROVIDERS

This section describes the background characteristics of all Healthcare Providers

4.2.1 AGE, SEX, AND MARITAL STATUS OF HEALTHCARE PROVIDERS

Out of the 30 respondents, 18 representing 60% were married, 9 have not married before, two (2) were divorced, and 1 representing 3.3% was separated. All respondents were between the ages of 20 to 59, indicating that the respondents are very active. The respondents were fifteen (15) males and fifteen (15) females. See table 4.8 on page 54 for details.

Table 4.8 Age, Sex and Marital Status of Healthcare Providers

Marital Status	Age Group	Sex		Total	Percentage (%)
		Male	Female		
Never Married	20 – 29	4	5	9	30.0
Married	20 – 29	0	4	4	60.0
	30 – 39	4	2	6	
	40 – 49	4	2	6	
	50 – 59	1	1	2	
Seperated	50 – 59	1	0	1	3.3
Divorced	50 - 59	1	1	2	6.7
Total		15	15	30	100

Source: Field survey, May, 2012

4.2.2 ROLE IN HEALTH COMMODITY MANAGEMENT

Majority (53.3%) of the respondents were prescribers, 26.7% were supervisors, 13.3% were dispensers, with only 6.7% as users of the commodities.

This implies majority (prescribers and dispensers, 66.6%) of the respondents deals directly with the clients and the commodities, with 26.7% (supervisors) over-seeing the dealings between the providers and the clients. Thus, majority of the respondents were conversant with the roles of commodities to healthcare delivery.

4.2.3 POSITION OF IN ORGANIZATION

In terms of position of respondents in the organization, 50% were Nurses, 16.7% were Pharmacists and Pharmacy technicians, 10% were Medical officers, 10% were Biomedical scientists and Laboratory technologist, with 3.3% each been Hospital orderly and an Accounts officer respectively. This therefore implies that, 93.3% of the respondents are 'critical staff', with only 6.7% been 'supporting staff'. This means that majority of the respondents were professional healthcare providers who knows what their clients need at a time. Refer to table 4.9 in Appendix IV for details.

4.2.4 AGE, SEX, LEVEL OF EDUCATION OF HEALTHCARE PROVIDERS

Out of the 30 respondents, 14 (46.7%) were males and 16 (53.3%) were females. Thirteen (13), representing (43.3%) of the respondents were between the ages of 20 to 29years, 6 (20%) each were between the ages of 30 to 39 and 40 to 49years respectively, with 5 (16.7%) between the ages of 50 to 59years. This implies the respondents were matured and energetic. Majority of respondents (90%) had their educational qualifications from diploma and above, with only 6.7% and 3.3% having certificate in nursing and middle school leaving certificate respectively. This means majority of the respondents were well educated. See table 4.10 on next page.

Table 4.10 Distribution of Respondents by Age, Sex and Level of Education

Level of Education	Age Group	Sex		Total	Percentage (%)
		Male	Female		
MDchb	30 – 39	1	1	2	6.7
	50 - 59	1	0	1	3.3
MBA/MSc	40 – 49	1	0	1	3.3
	50 - 59	3	0	3	10.0
BA/BSc	30 – 39	1	0	1	3.3
	40 – 49	2	2	4	13.3
HND	20 – 29	4	2	6	20.0
	30 – 39	0	1	1	3.3
Diploma in Nursing	20 – 29	1	5	6	20.0
	30 - 39	0	2	2	6.7
Certificate in Nursing	20 – 29	0	1	1	3.3
	40 - 49	0	1	1	3.3
MSLC	50 – 59	0	1	1	3.3
Total		14	16	30	100

Source: Field survey, May, 2012

4.2.5 NUMBER OF YEARS FOR WORKING IN HEALTH COMMODITY MANAGEMENT

Forty percent (40%) of the respondents have worked for over 6years in this capacity.

26.7% each have worked between 1 to 3years and 4 to 6years respectively in this

capacity, with 6.6% working for less than 1 year in this capacity. This implies majority of the respondents have experience when it comes to health commodity management.

4.2.6 TRAINING IN HEALTH COMMODITY MANAGEMENT

20 (66.7%) out of the 30 respondents have been trained in health commodity management, with 10 (33.3%) of the respondent having no form of training in health commodity management. Though majority have been trained, healthcare delivery and health commodities are very critical to the clients, and for that matter, all the providers must be trained in health commodity management.

4.2.7 SELECTION OF HEALTH COMMODITIES

Most of the respondents (83.3%) depend on services provided at the facility to select the health commodities. 40% uses the essential medicine list and 16.7% use the non-medicine list. Most of the respondents use almost all the multiple choice answers in selecting the commodities. This implies that, they use the essential medicine list, the non-medicine list, and they also depend on the services provided by the facility. This makes it possible to meet the policy requirements (essential medicine list and non-medicine list), as well as meet organizational policy (service provided). Table 4.11 on page 58 provides the details of the responses.

TABLE 4.11 Selection of Health Commodities

Selection	Number of Respondents	Percentage (%)
Essential Medicine List	12	40.0
Non-Medicine List	5	16.7
Based on service provided	25	83.3

Source: Field survey, May, 2012

4.2.8 ESTABLISHMENT OF MAX, MINIMUM, AND RE-ORDER LEVELS

Majority (76.7%) of the respondents establish stock levels for their commodities. This implies, majority of the respondents control their stock levels to help reduce or eliminate stock-outs, over-stocking and obsolete stocks.

4.2.9 UPDATE OF STOCK LEVELS

All respondents update their stock levels, 34.8% each do it weekly and monthly respectively, with 26.1% doing quarterly and 4.3%, semi-annually.

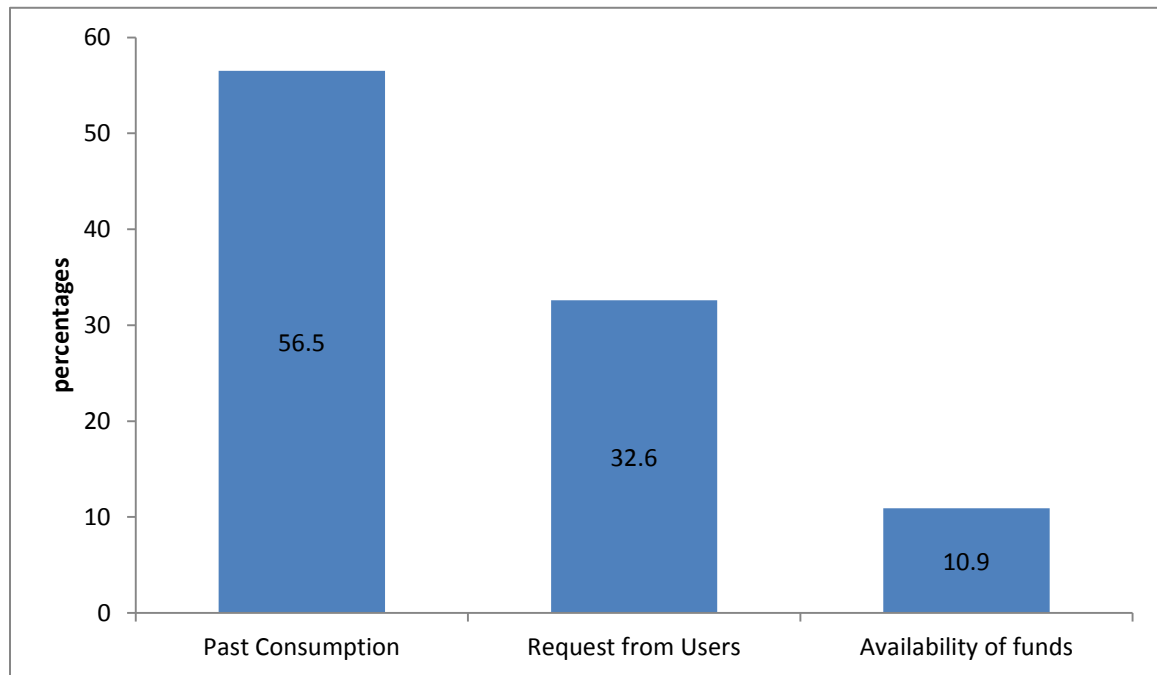
4.2.10 RECORDS FOR COMMODITIES?

When the above question was asked, all the 30 respondents said that they maintain separate records for all health commodities in their facilities.

4.2.11 DETERMINATION OF QUANTITY OF COMMODITIES

Majority of the respondents (56.5%) use their past consumption to determine the quantity of health commodities needed. 32.6% of the respondents use the request made by the users to determine their quantities. 10.9% uses availability of funds to determine the

quantity of commodity needed. Though all responses must be considered, in stock management, the past consumption is what is used to calculate the stock control work sheet to get the stock levels (maximum, minimum and re-order). See Fig. 4.8 below.



Source: Field survey, May, 2012

Fig. 4.8 Determination of Quantity of Health Commodities Needed by Providers

4.2.12 SOURCES WHERE UNIT RECEIVE THEIR COMMODITIES

Majority (54.2%) of the respondents receive commodities from the facility store, 37.5% from the Regional Medical Store, and 8.3% from Central Medical Store. No respondent receives commodities from a single source. The commodities are received from the facility's store, the Regional Medical Store (RMS) or from Central Medical Store (CMS), depending on the commodity and its availability at the CMS or RMS.

Majority of the respondents (83.3%) receives commodities within a day after a request have been placed. 10% of respondents receives their commodity between 2 to 4 days, while 6.7% receives commodities between 5 to 7 days after a request has been placed.

4.2.13 HOW SHORTAGES ARE DEALT WITH

All the 30 respondents said they have experience a situation where they run short of commodities while rendering service. When asked what they do in such a situation, majority (53.3%) said they ask the clients to buy from town. 26.7% said they place an emergency order for the commodities, while 20% said they go to borrow from other facilities. This implies the clients are at risk, because who knows whether they actually go to buy at all or whether the commodities were of the approved standards. Refer to Fig. 4.9 in Appendix IV.

4.2.14 GETTING HEALTH COMMODITIES READILY AVAILABLE AS AND WHEN NEEDED WITHOUT OVER STOCKING

When the respondents were asked the question above, 18 representing 60% of the respondents were of the opinion that, there should be a good commodity planning by the management of all the facilities. 12 respondents (40%) were of the opinion that, adequate stocktaking should be done for all health commodities in all health facilities.

4.3 HEALTHCARE RECEIVERS (CLIENTS)

4.3.1 AGE, SEX, AND MARITAL STATUS OF HEALTHCARE RECEIVERS

Majority of the respondents who took part in the survey were males (66.7%).

Out of the 18 respondents, 12 representing 66.7% were married, 5 have not married before, and 1 representing 5.5% was separated. All respondents were between the ages of 20 to 59, indicating that the respondents are very active. See table 4.12 below for details.

Table 4.12 Distribution of Respondents by Age, Sex and Marital Status of Clients

Marital Status	Age Group	Sex		Total	Percentage (%)
		Male	Female		
Never Married	10 – 19	1	0	1	13.3
	20 – 29	3	0	3	
Married	20 – 29	2	0	2	73.3
	30 – 39	2	5	7	
	40 – 49	3	4	7	
	50 – 59	3	3	6	
Seperated	30 – 39	0	1	1	3.3
Divorced	40 - 49	0	1	1	3.3
Widowed	60 and above	0	2	2	6.7
Total		14	16	30	100

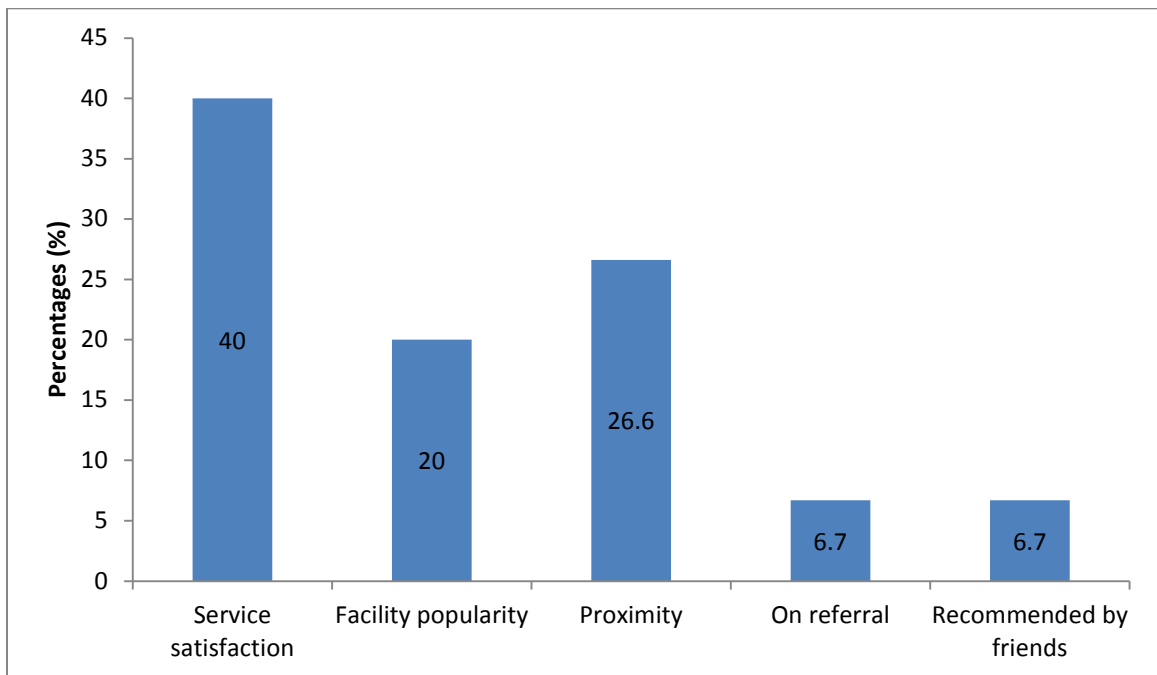
Source: Field survey, May, 2012

4.3.2 VISITING FACILITY FOR THE FIRST TIME

Out of the 30 respondents, 15 were males and 15 females, with 83.7% between the ages of 20 to 59years. When the above question was asked, 12 (40%) of the respondents were visiting the facilities for the first time, with 18 (60%) respondents haven visited for more than once.

4.3.3 REASONS FOR CHOOSING THIS FACILITY

Majority (40%) of the respondents said they chose the facility due to their service delivery, 26.6% said because of proximity of the facility to where they live. 20% of the respondents said they chose the facility because of its popularity, while 6.7% each said they were on referral and recommended by their friends respectively. See Fig. 4.10.



Source: Field survey, May, 2012

Fig. 4.10 Reasons for choosing this facility

4.3.4 ISSUANCE OF FOLDER

Twenty-seven (27) representing 90% of the respondents were given folders when they visited the facility. Out of the 27 respondents who were given folders, 51.9% spent between 15 to 30 minutes before they got the folders, 29.6% spent between 40 to 60 minutes, 11.1% spent over an hour, while only 7.4% spent less than 10 minutes waiting

for their folders. This implies, clients spend too much time before their folders are given to them. See table 4.13 below.

TABLE 4.13 Issuance of folder

Duration	Number of Respondents	Percentage (%)
< 10 mins	2	7.4
15 – 30 mins	14	51.9
40 – 60 mins	8	29.6
>60 mins	3	11.1
Total	27	100

Source: Field survey, May, 2012

4.3.5 WAITING TIME AT HISTORY TABLE

Majority of the respondents (50%) waited between 15 to 30 minutes before their history were taken. 33.3% waited between 40 to 60 minutes before their history were taken, 10% waited over 60 minutes, while only 6.7% waited for less than 10 minutes. This follows the trend of the waiting time for collection of folders. Refer to Fig. 4.11 in Appendix IV.

4.3.6 AVAILABILITY OF PROVIDER AND TIME SPENT WITH CLIENT

Majority (70%) of the respondents said the healthcare provider was available on time, with 30% saying, the healthcare providers were not available on time.

Also, 73.3% of the respondents said that the healthcare providers spent enough time with them, while 26.7% said the providers did not spend enough time with them.

4.3.7 COMFORTABLE PLACE TO SIT AND CLEAN FACILITY

Majority of the respondents (27 out of 30) replied that, they had a comfortable sitting place, but 3 respondents replied in the negative. Again, 28 out of the 30 respondents found the facilities clean, while 2 did not. This implies the peer review been done by the facilities are yielding dividends.

4.3.8 EXPLANATION OF TREATMENT TO CLIENT BY PROVIDER

When this question was asked, 90% (27) respondents said the provider explained everything about the illness and treatment to them, while 10% replied that the providers did not.

4.3.9 PROVISION OF X-RAY AND/OR LABORATORY SERVICES

Seventeen (17) out of the 30 respondents were asked to visit either the x-ray or the laboratory or both, while 13 did not. Fifteen (15), being (88.2%) of those who were asked to go for x-ray and/or laboratory said the services were provided at the same facility, while 11.8% had to go for these services outside the facility. This implies that majority of the facilities have x-ray and laboratory services.

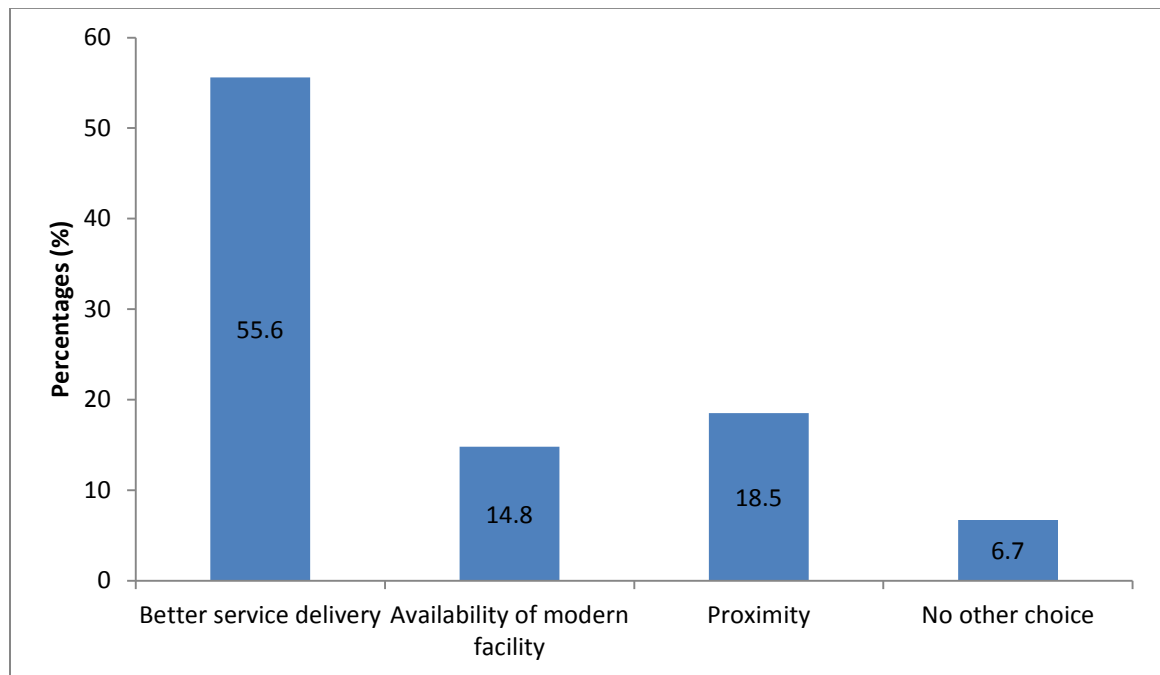
4.3.10 AVAILABILITY OF MEDICINES PRESCRIBED

When this question was asked, 50% of the respondents had all their medicines prescribed to them at the facility, while the other 50% did not had all their medications at the facilities that they visited.

4.3.11 RE-VISITATION TO THE FACILITY BY CLIENTS

Majority (90%) of the respondents said they will visit the facilities again when the need arises and also recommend the facilities to their friends and relatives, but 10% of the respondents said they will not visit the facilities again and neither will they recommend it to anybody.

Out of the 27 respondents who said they would visit the facilities again, 15 (55.6%) said they had better service delivery, 18.5% said they would do that due to proximity advantage, 14.8% were due to the availability of modern facilities at the place, while 11.1% had no other choice. The 3 respondents said they will not visit or recommend the facilities because their problems were not solved. See Fig. 4.12 below.



Source: Field survey, May, 2012

Fig. 4.12 Reasons for Re-visitation to Facility

4.3.12 SATISFIED WITH SERVICE DELIVERY

Majority (83.3%) of the respondents were satisfied with the service delivery at the facilities, but 5 (16.7%) of the respondents were not satisfied with the service delivery.

4.3.13 RECOMMENDATIONS ON IMPROVEMENT ON SERVICE DELIVERY

Forty (40) responses were received from the 30 respondents. Table 4.14 below explains the recommendations given by the respondents.

Table 4.14 Recommendations on improvement on service delivery by Clients

Recommendations	Number of Respondents	Percentage (%)
Facility should be stocked with medicines	10	33.3
Provision of more sitting facilities	5	16.7
Improve on staff strength	9	30
Provide x-ray and laboratory facilities	2	6.7
Upgrade facility to meet modern standard	10	33.3
Consideration to the aged	2	6.7
Staff should be motivated	2	6.7

Source: Field survey, May, 2012

From the responses above, it can be deduced that majority of the clients that visits our facilities wants the facilities to be stocked with medicines and also wants the facilities to be upgraded to meet modern standards. Some of the Clients are also of the view that the staff strength at the facilities must be increased to reduce the staff to client ratio.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

OVERVIEW

This chapter presents the conclusion and recommendations for improving inventory management in the health facilities in the Ho municipality in particular, and in Ghana as a whole.

5.1 CONCLUSION

It was established that health commodities needed were determined based on past consumption. This system helps not to over-stock the commodities, but it does not make provision for commodities that were out of stock at the period and also does not take into account the increase in demand for the commodities as the population grows.

Furthermore, it was established that most of the facilities use the Economic Order Quantity (EOQ) technique which focuses more on minimizing inventory itself in the management of their inventory, this technique helps to reduce cost of operation, but it does not take into accounts the value or relative impact of the individual commodity and therefore treats all commodities equally.

Also, majority of inventory managers and healthcare providers leave their jobs or facilities and travel long distances for the health commodities from either the Central Medical Stores (CMS) or the Regional Medical Stores. In most cases, these inventory

managers happened to be the only staff at the department or unit, thus depriving the facility of their valuable service.

Again, it was established that though majority of the facilities use the first expiry, first out (FEFO) method in storing and issuance of commodities, some facilities still use the first in, first out (FIFO) method which takes into accounts the arrival of the commodities and not the expiry of the commodities.

Another thing established was the shortages of health commodities that providers experience when rendering services to clients. This situation leaves clients with no other choice but to fall on the traditional medicines or travel over long distances in search of healthcare or seek spiritual assistance from churches, shrines, witch doctors and so on.

It was established that most medicines prescribed to clients by providers were not available at the facilities. Clients therefore visit pharmacy and license chemical shops for their medications. There is no guarantee that the clients are able to get the prescribed medicines at the pharmacy shops that they visit.

Last but not least, it was established that majority of the healthcare providers were of the opinion that there should be a good health commodity planning by the management of all the facilities, so that commodities are really available for use as and when they are needed. Clients on the other hand were of the opinion that the health facilities should be upgraded to meet modern standards and stocked with medicines. This will intend improve service delivery.

5.2 RECOMMENDATIONS

Based on the conclusion drawn from this study, the following recommendations were suggested by the researcher to help improve inventory management and healthcare delivery in health facilities in the Ho municipality.

It is recommended that the determination of health commodities needed should be based on quantity of commodities requested and not only the past consumption. This will make provision for quantities requested for, but was not received and consumed for a period and therefore eliminate or reduce stock-outs. The main purpose for inventory management is to make available a balanced or uninterrupted flow of materials and other commodities necessary to meet operational requirements.

Secondly, the researcher recommends that in addition to the Economic Order Quantity (EOQ) technique -- the technique that determines the point at which the combination of order costs and inventory costs are the least, the ABC Analysis which suggests that though all categories of inventory is important, inventory must be categorized or classified in accordance to their relative impact or value and treated differently must be used. This does not mean that some commodities are less important, but relates to the fact that all commodities in the A, B, and C categories are important to some extent and that strategy to assure availability at an appropriate level of cost.

The researcher also recommends that health commodities must be delivered directly to the facilities from the upper level facilities, Central Medical Store (CMS) and Regional Medical Stores (RMS), who are responsible for developing, communicating, implementing and maintaining a coordinated schedule for the delivery of health

commodities to the facilities they serve. The scheduled delivery system consolidates deliveries and results in overall time and cost savings. The staff at the health facilities now spend more time serving the external customer, the client, rather than filling out complicated forms, implementing time consuming procedures and leaving their post to travel over long distances to go to the Central Medical Store (CMS) and Regional Medical Stores (RMS) for essential medicines and medical supplies.

The researcher further recommends that all facilities must use the first expiry (FEFO) method in the storage and issuance of health commodities. Since the efficacy and quality of all health commodities are paramount, the expiration of all health commodities must be considered. The FEFO method is considered the best because, a commodity can be received which may have the expiry date nearer than that same type of commodity that is already stocked.

Lastly, as the safety of a patient is the top priority in healthcare delivery, the responsibility of inventory managers is to make health commodities available as and when needed; and ensure that the commodities purchased for clinical use are of good quality. The researcher recommends that there should be proper inventory control methods by setting accurate stocks levels for all commodities and requesting the accurate quantities of commodities from the Regional Medical Stores. The Regional Medical Stores and Central Medical Store must also make sure that they use the data (requisitions) from the facilities as a guide to procure the right quantity of commodities and deliver directly to the facilities on time. This would therefore reduce or eliminate stock-outs in the facilities. While inventory is concerned with monetary issues, health facilities are in the business of saving lives.

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APPENDIX I

QUESTIONNAIRE FOR INVENTORY MANAGERS AT GHS FACILITIES

INTRODUCTION

8. Have you ever received any training in health commodity management?
a) Yes b) No

PRODUCT SELECTION, QUANTIFICATION AND CONTROL

9. How is the selection of health commodities done in your facility?
a) Essential Medicines
b) Non Medicines list
c) Based on services provided
d) Others (specify)

10. Do you establish Maximum, Minimum, and Re-order levels for the health commodities? a) Yes b) No

11. If yes to question 10, how often do you update these levels?

- a) Weekly b) Monthly Quarterly
d) Bi-annually e) Annually

12. If No to question 10, how do you control your stock levels?
.....

13. Do you do Stocktaking? a) Yes b) No

14. If Yes to question 13, how often do you do it?

- a) Weekly b) Monthly c) Quarterly
d) Bi-annually e) Annually

15. Do you maintain separate records for all health commodities?

- a) Yes b) No

PRODUCT ORDERING AND DISTRIBUTION

16. How do you determine the quantity of health commodities needed?
a) Past Consumption

- b) Requests from Users
- c) Availability of Funds
- d) Others (specify)

17. How often is the quantity of health commodities needed ordered?

- a) Monthly
- b) Quarterly
- c) Bi-annually
- d) As the need arises

18. What type of Inventory Management Technique do you use at your facility?

- a) ABC Analysis
- b) Economic Order Quantity
- c) Material Requirement Planning
- d) Enterprise Resource Planning
- e) Distribution Resource Planning
- f) Others (specify)

19. From where does your facility receive its health commodities?

- a) Central Medical Store
- b) Regional Medical Stores
- c) Private Supplies
- d) District Directorate Store
- e) Others (specify).....

20. How long does it take your facility to receive commodities once an order has been placed?

- a) less than 1week
- b) 2 to 4weeks
- c) 5 to 8weeks
- d) 3 to 4mths
- e) 5mths and above

21. Have you ever experience Stock-Outs? a) Yes b) No

22. If yes to question 20, how did you deal with the situation?

23. What do you do if your ordered quantities are not met?

24. How do the commodities get to the facilities/clients?

- a) We deliver to the facility
- b) The facility comes for it themselves

c) Others (specify)

25. Who determines the quantity of commodities to be ordered?.....

.....

PRODUCT RECEIPT, STORAGE AND ISSUES

26. What are some of the documents received along with the commodities?

.....

.....

27. How is inspection of commodities done at your facility?

a) 100% inspection b) Random sampling inspection

28. At what stage of commodity arrival is inspection done?

a) Before Unloading b) After Unloading

c) Before Storage d) After Storage

28. By which method are commodities stored and issued in your facility?

a) First In, First Out (FIFO) b) Last In, First Out (LIFO)

c) First Expiry, First Out (FEFO)

d) Others (specify)

29. Do you have a separate location for quarantine commodities?

a) Yes b) No

30. How are commodities issued out of the warehouse/storeroom?

a) By Approved Requisition b) By Approved Distribution

c) Verbally by Higher Authority d) By In-charge's Discretions

31. What do you do when you are not able to meet a facility's request?

.....

.....

32. What do you think should be done to get commodities readily available to your facility as and when they need them without over stocking?

.....
.....

APPENDIX II

QUESTIONNAIRE FOR HEALTHCARE PROVIDERS AT GHS FACILITIES

INTRODUCTION

I am a CEMBA student of KNUST, conducting a research into the inventory management in the Ghana Health Service, and its role in healthcare delivery. You have been identified as someone who can assist by responding to the questionnaire intended for the research. I wish to assure you of utmost confidentiality of any information you may provide and also that your responses are only for the purposes of this research, Thank you.

15. Do you establish Maximum, Minimum, and Re-order levels for the health commodities? a) Yes b) No

16. If yes to question 10, how often do you update these levels?

- a) Daily Weekly c) Monthly
d) Quarterly Bi-annually

12. If No to question 10, how do you control your stock levels?

.....

13. Do you maintain separate records for all health commodities?

- a) Yes b) No

PRODUCT REQUISITIONING AND ISSUING

14. How do you determine the quantity of health commodities needed?

- a) Past Consumption b) Requests from Users
c) Availability of Funds
d) Others (specify)

15. How often is the quantity of health commodities needed requested?

- a) Daily b) Weekly
c) Bi-weekly d) Monthly
e) As the need arises

16. From where does your Unit receive its health commodities?

- a) Central Medical Store b) Regional Medical Stores
c) Facility Store d) District Directorate Store
e) Others (specify).....

17. How long does it take your unit to receive commodities once a request has been placed?

- a) Within a day 2 to 4 days 5 to 7 days
d) 8 to 14 days After 14 days

18. Have you ever experience a situation where you run short of commodities needed, whilst rendering service? a) Yes b) No

19. If yes to question 18, how did you deal with the situation?
-
20. How do you request for the health commodities for your Unit?
-
21. What do you do if your requested quantities are not met?
-
22. How do the commodities get to the unit/clients?
-
23. Who determines the quantity of commodities to be requested?
-
24. What do you think should be done to get commodities readily available to your clients as and when they need them without over stocking the commodities?
-
-

APPENDIX III

QUESTIONNAIRE FOR HEALTHCARE RECEIVERS (CLIENTS) AT GHS FACILITIES

INTRODUCTION

I am a CEMBA student of KNUST, conducting a research into the inventory management in the Ghana Health Service, and its role in healthcare delivery. You have been identified as someone who can assist by responding to the questionnaire intended for the research. I wish to assure you of utmost confidentiality of any information you may provide and also that your responses are only for the purposes of this research, Thank you.

BACKGROUND INFORMATION

- | | | |
|--------------|-------------------------------------|-------------------------------------|
| 1. Sex | a) Male <input type="checkbox"/> | b) Female <input type="checkbox"/> |
| 2. Age group | a) 10 - 19 <input type="checkbox"/> | b) 20 – 29 <input type="checkbox"/> |

c) 30 - 39

d) 40 - 49

e) 50 - 59

f) 60 and above

3. Marital Status a) Never married

b) Married

c) Divorced

d) Separated

e) Widowed

4. Is this the first time you visit this facility? a) Yes b) No

5. Why did you choose to visit this facility?

SERVICE DELIVERY

6. Were you given a folder? a) Yes b) No

7. If yes to question 6, how long did it take?

a) < 10min b) 15 - 30min

c) 40 - 60min d) > 60 min

8. If No to question 6, what was the reason?

.....

9. How long did you wait before your history was taken?

a) < 10min b) 15 - 30min

c) 40 - 60min d) > 60 min

10. Was the healthcare provider available on time? a) Yes b) No

11. Did the healthcare provider spent enough time with you? a) Yes b) No

12. During your visit, did you find a comfortable place to sit? a) Yes b) No

13. During your visit, did you find the facility clean? a) Yes b) No

14. Did the healthcare provider explain everything about your treatment to you?

a) Yes b) No

15. Were you comfortable with the room and ventilation? a) Yes b) No

16. Were you asked to visit the X-Ray and/or Laboratory? a) Yes b) No

17. If yes to question 16, did they provide the X-Ray and/or Laboratory at the facility?

a) Yes b) No

18. How long did you wait at the X-Ray and/or Laboratory Unit?

- a) < 10min b) 15 - 30min
c) 40 - 60min d) > 60min

19. If No to question 17, where was it provided?

.....

20. Was the medication provided on time? a) Yes b) No

21. Did you receive all the medicines prescribed to you at the facility?

- a) Yes b) No

22. If No, where are you going to get the rest from?

23. Were you given any explanation why all your medicines were not provided at the facility? a) Yes b) No

24. Would you refer this facility to your friends and relatives? a) Yes b) No

25. Will you visit this facility again when the need arises? a) Yes b) No

26. If Yes to question 25, why?

27. If No to question 25, why?

28. Are you satisfied with the service delivery? a) Yes b) No

29. Please, specify if there was anything else we could have done to improve your experience during this visit?.....

.....
.....
.....

APPENDIX IV

TABLES AND FIGURES

Table 4.3 Distribution of Respondents by Age, Sex and Level of Education of Inventory Managers

Level of Education	Age Group	Sex		Total	Percentage (%)
		Male	Female		
'A'/'O'/SSS	20 – 29	1	1	8	44.5
	30 – 39	1	1		
	40 – 49	2	1		
	50 - 59	1	0		
HND	30 – 39	2	2	6	33.3
	40 – 49	1	0		

	50 - 59	1	0		
BSc/BA	30 - 39	2	1		
	40 - 49	1	0	4	22.2
Total		12	6	18	100

Source: Field survey, May, 2012

Table 4.4 Establishment of Max, Min, and Re-order level by Inventory Managers

Responses	Number of Respondents	Percentage (%)
Yes	16	88.9
No	2	11.1

Source: Field survey, May, 2012

Table 4.6 Location for Quarantine Items

Responses	Number of Respondents	Percentage (%)
Yes	16	88.9

No	2	11.1
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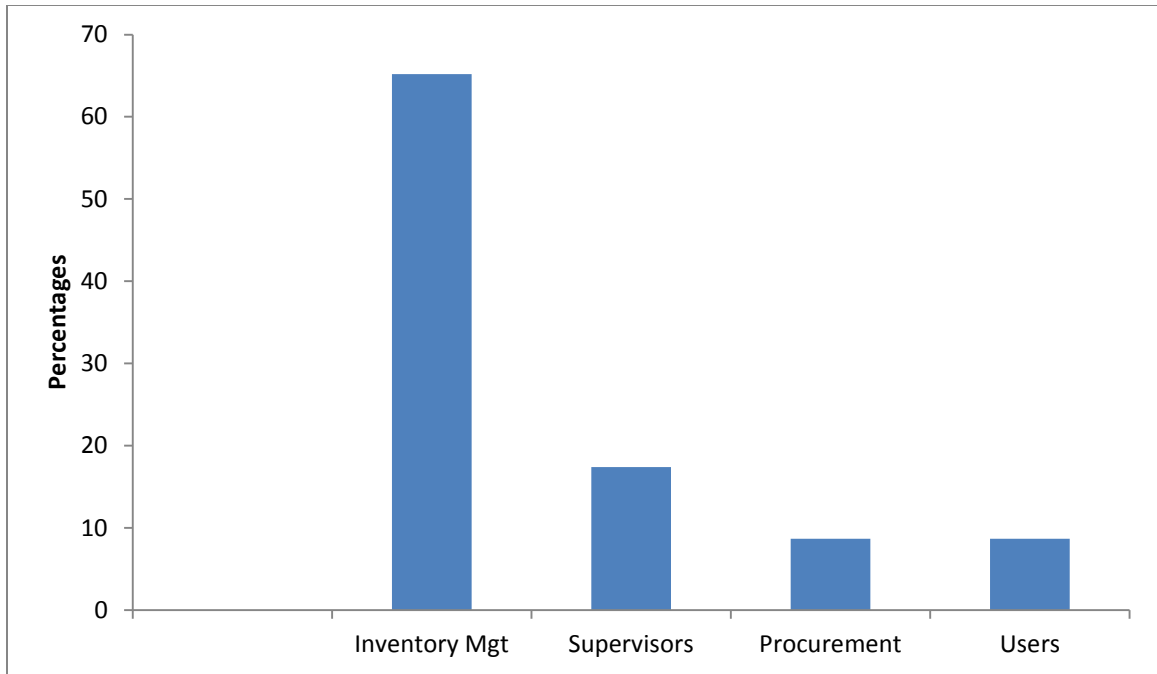
Source: Field survey, May, 2012

Table 4.9 Distribution of Respondents (Providers) by Position in Organization

Position in Organization	Number of Respondents	Percentage (%)
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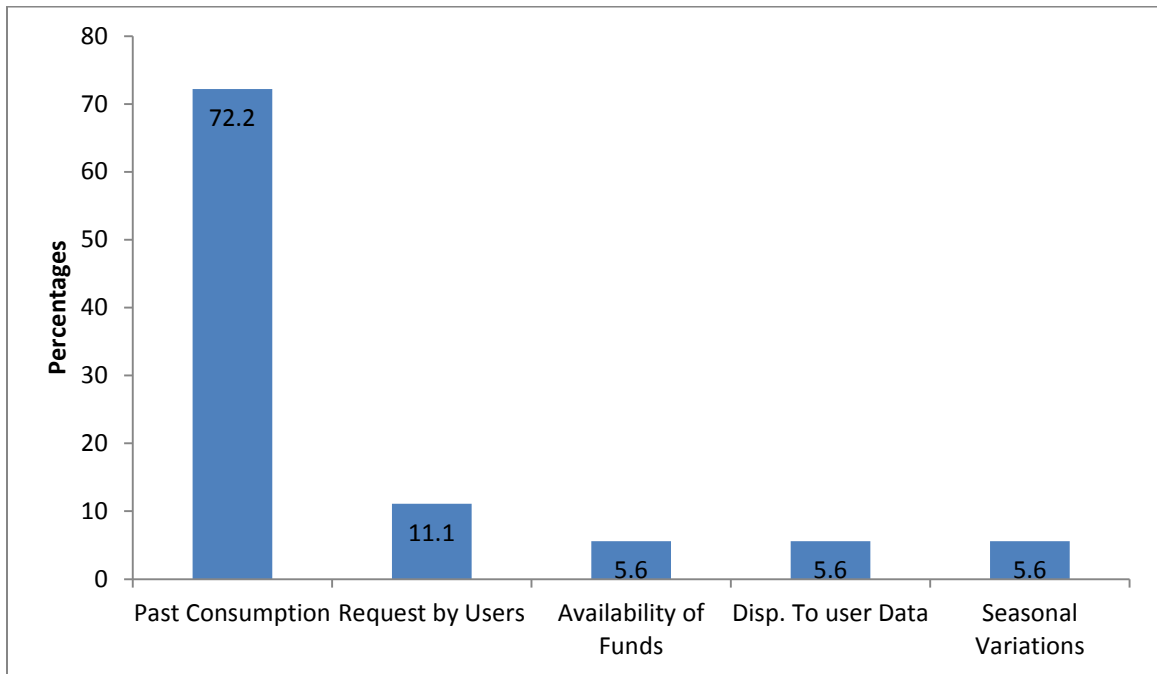
Accounts Officer	1	3.3
Asst Chief Pharmacy Technician	2	6.7
Biomedical Scientist	2	6.7
Community Health Nurse	3	10.0
Head Orderly	1	3.3
Pharmacist	3	10.0
Jnr Staff Nurse	1	3.3
Laboratory Technologist	1	3.3
Medical Assistant	2	6.7
Medical Officer	3	10.0
Midwife	4	13.3
Staff Nurse	5	16.7
Snr Staff Nurse	2	6.7
Total	30	100

Source: Field survey, May, 2012



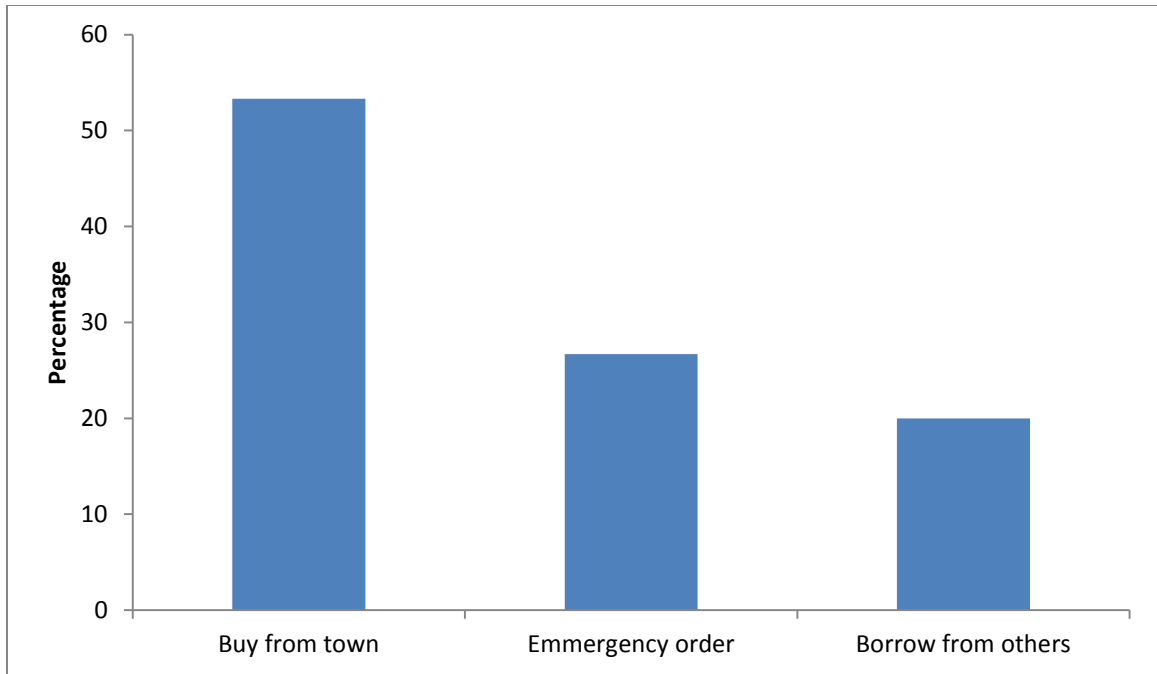
Source: Field survey, May, 2012

Fig. 4.1 Roles of Respondents in Health Commodity Management



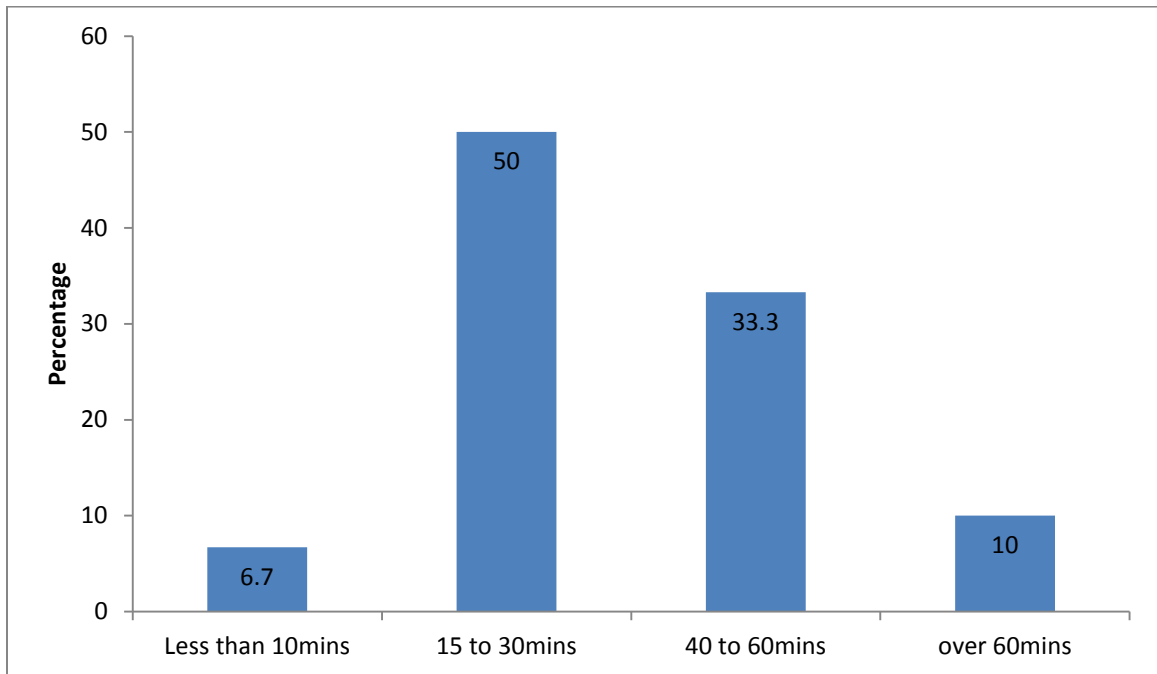
Source: Field survey, May, 2012

Fig. 4.5 Determination for Quantity of Commodity Needed by Inventory Managers



Source: Field survey, May, 2012

Fig. 4.9 How Shortages are Dealt with by Providers



Source: Field survey, May, 2012

Fig. 4.11 Waiting Time at History Table by Clients