

Assessing the Challenges in Supply Chain of Health Commodities in the Health Industry

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Abstract

This project work addressed assessing the challenges in supply chain of health commodities in the health industry. Supply chain management should be given the prominence it deserves in order for the business to stay competitive, flexible for the demand and service at low cost. Supply chain is difficult to manage and control, and inventory managers find it challenging to know when to order and how much to order. The research was descriptive in nature and was conducted through the use of quantitative research methods. This project was divided into five chapters, chapter one being the introductory analysis, providing definitions and nature of supply chain management practice. Chapter two explained different authors' view on the subject matter based on the topic. Chapter three is the methodology which explained the method the researcher used in achieving its results. Chapter four is the presentation of data and discussion. Data are provided in a tabular form and analyzed using simple percentage method. Chapter five is the conclusion which is drawn based on the research findings and recommendation are made on how to improve supply chain management practice in health sectors and other organizations. The objectives of the study were, to identify the cause of inadequate forecasting of health commodities in the supply chain, to assess the factors that cause inadequate funding of health commodities in the supply chain in Regional Medical Stores, to investigate the problems associated with sharing of information between Regional Medical Stores and Health facilities, to determine how the challenges associated with delivery of health commodities from Regional Medical Stores to Health centers affect supply chain. Limitations of this study were hindered by many factors of which time was the most pressing one. Inadequate forecasting of health commodities in the supply chain function, insufficient funding of health commodities in the supply chain, poor communication and flow of information between the regional medical stores and the health facilities and lastly, poor road structure and non-availability of vehicles to enhance the smooth delivery of health commodities to the various health centers. In general, the study recommended that stakeholders should focus on well-functioning transport management systems and inventory management policies, with strong political involvement, clear responsibilities and roles, good supervision systems and adequate budgeting. Examples include aspects such as building up knowledge in innovative ways, providing easy access information, creating awareness about the importance of guidelines and standardization, designing appropriate process performance indicators, focusing on regular monitoring, hiring dedicated employees for quantification and using new technologies to enhance efficient communication, real time tracking and data transfer. Based on the findings of the study also recommended that, Regional Medical Stores should get experts in the field of health commodities management to do refresher courses for their Supply officers as well as make it a point to make the knowledge on this concept known to every staff member of other departments for an improved health service delivery.

Keywords: Challenges Supply Chain, Health Commodities, Logistics & Supply Chain Challenge

1.0 INTRODUCTION

The World Health Organization (WHO) defined access to medicine as a priority for citizens. It needs to be available at all times in adequate amounts, in appropriate dosage and quality and at an affordable price for individuals and communities (Marks, 2009 and Yadav et al., 2011). It estimated that two billion people do not have access to medicines and four million lives per year could be saved in Africa and Southeast Asia with the appropriate treatment and medicine (Marks, 2009). With this estimate in mind, WHO and 192 states committed themselves to reaching eight Millennium Development Goals. The fourth millennium goal on the list is to reduce the child mortality rate; the fifth is to improve maternal health and the sixth, to combat HIV/AIDS, malaria and other diseases (WHO, 2012). WHO focuses on policies, access, quality and rational use, to ensure medicine availability, (USAID, 2008a).

Developing countries such as Ghana have several issues with an appropriate supply of pharmaceutical products to health centers (HC). Often the Ministry of Health (MOH) sets up semi-autonomous entities such as a National Level Medical Store (NLMS), who is responsible for the purchase, storage and distribution of medicine and medical supplies to health centers across the country including general hospitals and dispensaries. Typical challenges within the national health systems, which impact the supply chains, include inadequate forecasting, insufficient funds, delays in funding disbursements and long lead times (tendering and manufacturing) and distribution. To add to the complexities, there are typically several donor funded program specific supply chains that run in parallel to the national health systems. These potentially duplicative efforts across the supply chains can result in inefficiencies in an already

resource constrained environment. The focus is going to be on challenges in the supply chain management of general medicines. From a supply chain standpoint the NLMS struggles with distribution planning and vehicle routing due to a number of factors including ordering behaviour of HCs, poor communications and flow of information between the various stakeholders, limited use of technology solutions, poor road structure and availability of vehicles. Furthermore, it is difficult to measure performance indicators such as pharmaceutical product availability and therefore often difficult to determine constraints and identify possibilities to improve the supply chain (WHO, 2006).

1.1 Problem Statement

A problem statement is the description of an issue currently existing that needs to be addressed. It provides the context for the research study and generates the questions that the research aims to answer. The statement of the problem is the focal point of any research. The problems of this study are; inadequate forecasting of health commodities in the supply chain function, insufficient funding of health commodities in the supply chain, poor communication and flow of information between the regional medical stores and the health facilities and lastly and poor road structure and non-availability of vehicles to enhance the smooth delivery of health commodities to the various health centres.

1.3 Research Objectives

The general objective of this study is to assess the challenges in supply chain of health commodities in the health industry. Using regional medical stores as a case study.

The specific objective of the research includes

1. To identify the cause of inadequate forecasting of health commodities in the supply chain.
2. To assess the factors that cause inadequate funding of health commodities in the supply chain in Regional Medical Stores.
3. To investigate the problems associated with sharing of information between Regional Medical Stores and Health facilities.
4. To determine how the challenges associated with delivery of health commodities from Regional Medical Stores to Health centres affect supply chain.

1.4 Research Questions

Germane to research objectives, evolved the following research question:

1. What are the causes of inadequate forecasting of health commodities in the supply chain?
2. What are the factors causing inadequate funding of health commodities in the supply chain in Regional Medical Stores?
3. What are the problems associated with sharing of information between Regional Medical Stores and Health facilities?
4. How does the challenges associated with delivery of health commodities from Regional Medical Stores to Health centres affect supply chain?

1.5 Scope of the Study

The scope of this study will focus on Public health challenges in the supply chain management of general medicines in regional medical stores. This study is mainly be investigative and clarifying in nature. According to Aaker and Day (1986): “investigative research is used when one is seeking insights into the general nature of a problem, the possible decision alternatives, and relevant variables that need to be considered. There is typically little prior knowledge upon which to build.” Since supply chain, management can be considered a new area of study with limited research in this area, especially within Ghana in context. Investigative part of this study is required to explore and describe Public health challenges in the supply chain management of general medicines in Regional Medical Store.

1.6 Research Methodology

The analysis of case studies will be conducted through qualitative analysis: i.e. defining a structured questionnaire for interview of staffs of Regional Medical Stores. In addition to this, desk research and analysis of available data and documentation will be used as a benchmark to assess the answers of the respondents. Reports of the specific case studies will be produced (in a narrative manner but indicating when possible already available quantitative data in terms of inputs-outputs and outcomes of the specific initiatives). Statistical Package for Social Scientist (SPSS v20) software programmer will be used to analyse the raw data. The analytic strategy, which will be

used in the study, will be primarily informed by what best fits the data. Based on appropriateness and the explorative nature of the study, descriptive statistics such as frequencies and percentages will mostly be utilised.

1.7 Significance of the Study

Pragmatic research depicts that supply chain management contributes highly to organizational performances. Tan et al (1998) found that customer relation and procurement practice affects the effectiveness of supply chain management strategies and lead to the fiscal and market performances. This research shall be very significant in the following areas: Firstly, to the management of Regional Medical Store, it will help enhance compliance level to the policies regarding pharmaceutical products from production to delivery stage since such policies are supposed to be the guiding principles to the prompt delivery of customer's needs. Secondly and academically, supply chain activities in the private sectors have been unknown to the major players in the economy even though governmental entities and public procurement practitioners have diligently worked to improve supply chain management and public procurement practices. This research shall add up to the existing knowledge of supply chain management and its practices in the public sector. Lastly, the state would benefit a lot from this research because it will bring to bear the successes and failures of the practice of supply chain management in the public sector.

1.8 Organization of the Study

For the purposes of ensuring a proper presentation of the research work, this study will be categorized into five chapters. Chapter 1 is the introductory chapter. It will give the background to the study and introduces the subject matter of the project. It will cover issues such as; statement of the problem, objectives, and the research questions, scope, significance, the organization of the study, and limitation of the study. Chapter 2 will cover the literature review of the study, some definitions and what various authors say about the topic in question. Chapter 3 will contain the research methodology; the population and sampling method used, data collection activities, and the data analysis procedures are all included in this chapter. Chapter 4 will deal with the data analysis and discussions. The research objectives and questions, analysis of the data collected and discusses the findings of the research. Chapter 5 is the last chapter and it will cover the summary of the research and the research findings, recommendation and conclusion of the study.

1.9 Limitation of the Study

This research should have covered all health industries in Ghana to come out with finding for generalization but due to time constraints, the research will only be limited to regional medical store.

2.0 LITERATURE REVIEW

Commodity management refers to overseeing the logistics of receiving, storing, transporting and distributing commodities along with maintaining commodity accounts and documents, preparing necessary commodity reports and keeping commodity losses to an acceptable minimum. (MSH, 2009). In the context of health services, commodities include reagents and test kits, laboratory equipment and supplies, condoms, vitamins, and other medical supplies and equipment such as specimen collection tools. However, it is recognized that the availability of commodities for related services is critical to the success of comprehensive health programs. According to African Medical research, Foundation (2009) commodity management is a set of activities and procedures that ensure that health commodities are available, accessible and of high quality. Health commodities management has also been defined by GTZ (2007) as the activities that health care providers must perform to get sufficient quantities of health commodities — of assured quality, at a competitive price and in accordance with national and international laws — to the patients who need them, in a reliable and timely fashion,

2.1 The Importance of Effective Health Commodities Management

The proper management of health commodities ensures that they are available and accessible to all staff serving patients at a health facility. Thus all staff has an important role to play in ensuring good commodity management even if they do not directly handle the commodities. AMREF (2009) says Commodity management is important for the following reasons such as demand for health care services, Quality of health services, cost, prevents wastage, ensures continuous availability, ensures full supply and avoids irrational or incorrect use. These are explained in turn as follows:

2.1.1 Demand for health care services

The availability of drugs, health commodities increases the demand for health care services. If the commodities are not continuously available and accessible, then a health facility is not able to offer the care and treatment required.

2.1.2 Quality of health care services

Presence of commodities increases staff motivation to provide services. When commodities are not available, then staff feels discouraged since they are not able to offer good patient care.

2.1.3 Cost

Most health commodities are Costly to procure and to manage, yet most developed countries and Ghana inclusive have limited resources. Managing the commodities ensures that they are stored and distributed efficiently to prevent wastage.

2.1.4 Ensure continuous availability

Some health commodities example ART is lifelong. This means that continuous availability of the ARV drugs is required at the health facility where the patient receives his treatment.

2.1.5 Prevent wastage

Many health commodities have a short shelf life, usually less than 2 years by the time they reach a health facility. Hence, there is need for careful management to minimize expiries.

2.2 The Commodity Management Cycle

Management Sciences for health (2009) describes the commodity management cycle made up of various components and these components are listed and discussed below. Product selection, Procurement, Inventory management (with storage & distribution),

2.2.1 Product selection and effective health commodities management

The product selection process allows you to lay a sound basis for selecting commodities. It guides by giving the reasons and criteria that should be used for deciding which products to procure AMREF (2009). In any logistics system, products must be selected. In a health logistics system, product selection may be the responsibility of a national formulary and therapeutics committee, pharmaceutical board, board of physicians, or other government appointed group. Most countries have developed essential drug lists patterned on the World Health Organization (WHO) Model List. The committee's ability to select from among products is influenced by other elements of the logistics cycle. Perhaps the most important of these is the budget available to purchase the chosen products. For example, boards often choose generic drugs over name brands that may be more expensive. Many programs supplement the development of essential drug lists (which focus on those products deemed most cost-effective in treating priority health problems) with programs to promote rational drug use. Rational drug use efforts aim to help prescribers choose the right product for each health problem and the correct quantity to dispense. Good dispensing practices and patient education on using drugs correctly are other elements of rational use programs.

2.3 Procurement and Effective Health Commodities Management

According to WHO (2000), fully one-third of the world's population does not have access to essential medicines. In Sub-Saharan Africa and South Asia, the figure is closer to 50 percent WHO/WTO (2001). The problem is in part financial. The combination of donor support, multilateral loans, country financing, and out-of pocket expenditures is inadequate to meet the growing need among poor populations for essential medicines, including contraceptives and other Reproductive health products. On closer examination, the inability of country programs to procure medicines effectively and efficiently is also a major cause of poor access. Procurement agencies in parts of the world where access is low are paying many times more than standard international reference prices for essential medicines, which effectively reduces product availability in clinics and hospitals (HAI 2006).

The process of obtaining services, supplies, and equipment in conformance with applicable laws and regulations (USG 1996)—takes place locally, nationally, and internationally among a number of public, private, national, and local entities. The procurement process is inherently complex because it involves the coordination of MOH agencies, funding sources, suppliers, and manufacturers. In low-income countries, the process is often constrained by limited human resources, inadequate financing, an absence of information on prices and suppliers, a lack of awareness of government and donor regulations, overlapping systems, and unsynchronized or outdated rules

and guidelines. These constraints can contribute to delayed shipments, high prices, and, ultimately, reduced access to essential medicines for consumers. The lack of capacity to select, forecast, and quantify product requirements, and to manage the procurement process, disrupts the distribution of health commodities to the client. In this context, commodity security cannot be strengthened unless procurement functions are made more effective.

2.3.1 Quantification

Quantification is not a new concept. For example, we quantify how many liters of milk we consume every day based on our budget and use that as the basis to purchase the milk. Similarly, in health commodities quantification refers to the process of calculating the quantities of specific commodities required for a health program for a given amount of resources available, e.g. for a given budget. For example, you may want to quantify the commodities needed for a HIV/AIDS program in order to treat and care for 100 patients within a budget of 10 million Ghana cedi (Foster, 2009).

2.3.2 Inventory control, storage & distribution and effective health commodities management

After the product arrives in a country, it enters the inventory management and distribution system; this includes all the storage facilities and transport links at the various levels throughout the system. Adequate storage and inventory control is a challenge many drugs expire before they can be used, or they are used irrationally. Eventually, and at the right time, the products reach the service delivery point, which might be a health facility, laboratory, or community health worker. Finally, at the point of delivery to the customer, there is product use. Availability of health commodities alone does not ensure quality of care. Drugs must also be rationally prescribed and dispensed; and clients, especially providers, must be aware of the treatment guidelines for the products. Rational prescribing and use of drugs is a major challenge, even where STGs and EMLs exist. Physician training in rational prescribing is gaining ground but is still not widespread (Deliver, 2003).

In the past, essential drugs, vaccines, and contraceptives were for the most part distributed using separate logistics systems. For vaccines and contraceptives, such systems were organized vertically to some extent, and because they were concerned with a far more limited range of products, the task was somewhat simpler. A push has been made to integrate the distribution systems for drugs, vaccines, and contraceptives, although in most places separate systems are still operating, at least at the national level and often down to provincial levels. Vian and Bates (2003) noted a number of changes to the distribution systems in the past few years. In many countries, health sector reform programs included efforts to reform central medical stores to allow more autonomy and to introduce commercial incentives and improved management methods. In some cases, this reform has led to higher staff productivity, better performance, and more enforcement of payment policies. However, disruption in supply often occurs during central medical store transition phases. Increased integration of commodities, including contraceptives and vaccines, has also been noted. In some cases, it has decreased the amount and reliability of data collected on logistics, creating problems for needs estimation and for tracking of consumption (Vian and Bates 2003).

Another trend is the increasing use of private transporters and contracting out for transportation management; contracting transport can generate cost savings and improve services. Finally, a trend toward computerized systems exists, particularly involving the use of donor-financed software for improved management of logistics as well as a number of comprehensive assessment tools and indicator sets for evaluating drug supply systems. But the proliferation of software systems, with little coordination and not enough support and maintenance of complex and fragile computer systems, can be counterproductive, especially if paper-based systems that are difficult to reintroduce upon failure of the computer system are abandoned (Vian and Bates 2003).

2.3.4 Storage and stocks management

Drugs require secure storage in controlled climatic conditions and a reliable method of stock rotation. The FIFO, rule (first in, first out.) helps ensure that older stock is used up first. Security is another major consideration: access to the storehouse must be carefully controlled so that theft and embezzlement are minimized, and the persons who control access must themselves be trustworthy. Proper storage conditions, including minimizing exposure to heat, light, and humidity, are important for some drugs, but most drugs have proved remarkably resistant to poor conditions. Notable exceptions are tetracycline products, which become toxic when exposed to heat and oxytocin and ergometrine, which lose their potency when exposed to light and heat; all should thus be stored in the refrigerator. The same applies to insulin and, of course, most vaccines. Correct FIFO stock rotation will ensure that exposure to harsh conditions is minimized and that potency is preserved as much as possible. Ensuring good air circulation and preventing direct water contact are most important.

2.3.5 Management of donated drugs

Management of donated drugs is a major problem in some areas, particularly if an emergency has precipitated an influx of drug donations. The best strategy is to accept only invited donations of drugs that the facility has specifically asked for (WHO 1999a). Any drug that is neither vital nor essential, that is not labeled clearly with its generic name, that is expired, that is in a package that contains only a few days' dosage, or that is not on the national essential drugs list or on the facility's formulary should be discarded—and the pharmacist should feel no guilt and fear no sanctions about disposing of such materials. They take up space, require tracking like other drugs, and present a risk of being accidentally dispensed to a patient and causing the patient harm—a factor that must also be taken into account. Proper disposal can be a problem. These drugs constitute potential toxic waste, and they should be treated as such and disposed of so that they cannot be retrieved and sold (WHO 1999b).

2.3.6 Vaccine management

Vaccines are delicate products that are destroyed if handled incorrectly. Vaccine management involves the use and distribution of vaccines, from the manufacturers to the end users. Aspects of vaccine management include inventory and forecasting, stock control, in-country distribution, storage and handling, equipment replacement plans, procedures for the use of the vaccine, monitoring of vaccine storage, transport management, and operational management.

Forecasting of vaccine needs is the first building block of an adequate management system. In 2002, 22 of 82 countries surveyed by UNICEF indicated that they had experienced a vaccine stock out. In addition to lack of resources, the main reasons cited included poor or late forecasting. At the country level, emphasis is being put on the use of new tools, such as the vaccine vial monitor. This heat-sensitive label is a time-temperature indicator used to ensure that the vaccines have not been damaged by excessive exposure to heat, to identify weaknesses in the cold chain, and to take vaccines beyond the cold chain to children who have no access to fixed health facilities. Together with the increased use of vaccine vial monitors, the gradual adoption of the multidose vial policy contributes to the reduction of wastage. This policy of using opened multidose vials of vaccine in subsequent immunization sessions applies to all multidose vials of liquid vaccine containing thimerosal (WHO 2000). The policy was formulated in 1996 but its adoption remains limited.

2.3.7 Logistics management information system and effective health commodities management

WHO (2009) states that designing an effective and sustainable supply chain system for drugs and other commodities is important and can be complex. A correctly run distribution system should also keep drugs in good condition, rationalize drug storage points, use transport as efficiently as possible, reduce theft and fraud and provide information for forecasting needs. This requires a good management of the system along with a simple but well-designed information system in place. Data for decision making is crucial to the operation of any logistics system. Commodity procurement and financing, shipment scheduling, and routine ordering, among others, cannot be accomplished without accurate logistics data. An agile LMIS captures the right amount and types of data from all levels of the system in a timely manner and ensures an uninterrupted supply of ARV drugs despite unpredictable and rapid changes in consumption.

2.4 Management Support and Effective Health Commodities Management

The commodity management cycle is held together by a good management support system. Management for health sciences (2009) and the components are discussed below.

2.4.1 Organization and Staffing

A logistics system can only work if well-trained and efficient staff place orders, move boxes, and provides goods to clients. Health programs must be organized to provide the appropriate resources (for example, supervision authority and technical knowledge) to complete logistics activities. Organization and staffing, therefore, are an important part of the cycle. Logistics staff must make the six rights a top priority for a logistics system to work properly.

2.4.2 Budget

Budgeting affects product selection, the quantity of products procured the amount of storage space available, and the number of staff working in logistics. Logistics activities must receive sufficient funding in the budget if the whole system is to operate effectively. 2.4.3 Supervision. Supervision of the logistics system keeps it running smoothly and helps anticipate needed changes. Effective supervision helps avoid problems or resolves them quickly before they grow into crises. 2.4.4 Evaluation Evaluation of the logistics system can help demonstrate the impact of the system

on other elements. 2.5 Alternate systems of Health Commodities supply The Essential Monitor (1998) looks at alternative systems of commodities supply and these are discussed.

2.5 Central Medical Stores (CMS)

This is a conventional drug supply system, in which drugs are procured and distributed by a centralized government unit; a central medical store should serve the public through the selection, procurement, storage, sale, and distribution of good-quality, safe, and cost-effective pharmaceuticals and health commodities for use in the diagnosis, treatment, and prevention of disease. In a number of countries, the CMS is part of a broader procurement and distribution unit. The procurement function is often set apart in a separate purchasing department or procurement unit, with the CMS managing the warehousing and distribution only. In Ghana, for example, the MOH's PSD has management responsibility for both the CMS and a separate Procurement Unit that purchases essential medicines, consumables, and capital goods for the MOH. In this model, a procurement unit for health sector goods completes the bidding and tendering process directly or manages third party procurement agents acting on its behalf. This model does not preclude contracting out some components of the supply chain, such as transportation. One of the main drawbacks of the CMS model is the potential for political interference and the lack of accountability and performance resulting from high staff turnover. The following are some of the functions and services of this model: procurement, warehousing, and distribution of medicines and medical supplies; quality assurance of medicines; drug information services; and training in materials management.

2.5.2 Autonomous supply agency

An ASA is a central store managed by an autonomous agency that reports to the government or is managed by a private firm under government contract. The ASA model is similar to the CMS model but usually operates with different financing mechanisms, such as a revolving drug fund (RDF) and different governance structures. An example of an operational ASA is the Medical Stores Department (MSD) in Tanzania, which has its own legal framework, incorporated in the Medical Stores Tender Board Act No. 13 of 1993. After the Tanzanian National Pharmaceutical Company (NAPCO) was liquidated in 1997, most of its functions were taken over by the newly formed MSD, which today is the major procurement, warehousing, and distribution body in Tanzania. This was a way to bring strong procurement management into the public sector and satisfy the demands of stakeholders for a more effective and efficient use of public resources. Under its mandate, MSD can contract with outside agencies (NGOs) to procure on its behalf; it uses ICB procedures and economies of scale to achieve competitive prices for pharmaceuticals and other health commodities. There is a risk element in the governance and accountability of ASAs. Good oversight and auditing, along with performance monitoring and evaluation, are minimum requirements.

2.5.3 Direct delivery system

This is a decentralized, non CMS approach in which drugs are delivered directly by suppliers to districts and major facilities. The government drug procurement office tenders to establish the supplier and price for each item, but the government does not store and distribute drugs from a central location;

2.5.4 Primary distributor system

Another non CMS in which the government drug procurement office establishes a contract with a single primary distributor, as well as separate contracts with drug suppliers. The primary distributor is contracted to manage drug distribution by receiving from the suppliers, storing, and distributing all drugs to districts and major facilities;

2.5.5 Fully private supply

In some countries, drugs are provided by private pharmacies in or near government health facilities. It is possible to identify some advantages and disadvantages for each of the above systems and to make some theoretical comparisons, but true comparisons of cost-effectiveness have not been made. In part this is because other issues have made such comparisons very complex. The introduction of policies on user charges, decentralization, contracting-out and privatization all have an impact on the drug supply system.

2.5.6 Centrally managed parastatal

A parastatal organization is a company or agency owned or controlled wholly or partly by the government. Public procurement by parastatal organizations is regulated by the specific laws that establish these organizations; in addition, the parastatal promulgates its own financial and procurement regulations and claims certain autonomy. However, despite the autonomy these companies claim to have, they are often subject to political influence. Since the mid-1990s, many Sub-Saharan African countries have established divestiture strategies for privatizing or liquidating

their parastatals, mainly for economic reasons. An example of a functioning parastatal in the field of pharmaceutical and health commodities procurement and distribution is the Ashanti Regional Medical Supplies Agency (This parastatal functions with a board of directors and includes representation from the Ghana Medical Association (GMA). Their mandate includes the procurement, warehousing, and distribution of health commodities. Currently, it operates a cash-and-carry pull system for health commodities on behalf of the public sector. Generally, parastatals make their own decisions on procuring health commodities, ideally based on price and quality. This includes the selection of generic versus branded products.

2.6 Challenges in Health Commodities Management

Inadequate availability of and access to essential health commodities are major barriers to the delivery of essential health care in developing countries. A recent survey in Nepal found that the availability of 32 selected essential reproductive health (RH) commodities in public sector outlets was less than 25 percent Rao and Thapa (2005). In a companion study in Nicaragua, only 20 percent of these medicines were available to public sector clients PATH (2005). Efforts to address this challenge have focused on seeking additional and diversified funding sources and procurement channels. These efforts are essential. Adequate funding to purchase commodities and functional procurement mechanisms are prerequisites for any program. However, these efforts have resulted in a more complex procurement environment involving more choices and requiring greater coordination. They have increased the burden on existing systems already struggling with limited human and organizational capacity. In this context, it is therefore crucial to understand how to strengthen procurement management systems and untangle the combinations of options and strategies available to public health sector procurement programs. The main objective of effective health commodities management is to ensure that the necessary products are available where and when they are needed, in the correct quantities and that they are used properly. Barriers to achieving these objectives can occur at any of the four stages of the health commodity management cycle and these as discussed below The Essential Monitor (1998) outlines these major challenges.

2.6.1 Restricted selection

Outdated national guidelines for testing, diagnosis and treatment that are inconsistent with recent international (e.g. WHO) guidelines and best practices often cause health care managers to make unwise choices. A dearth of accurate data and information about the quantity and quality of the products required also undermines their work. Selection may be restricted by long in-country delays in approving medicines and diagnostics that have already been approved by stringent regulatory authorities (WHO Selected Medicine Information Systems or the U.S. Food and Drug Administration, for example). Furthermore, few governments have chosen to exercise the flexibilities that allow for the domestic production of generic medicines in public health emergencies such as HIV epidemics. A further challenge is the widespread availability of counterfeit and substandard medicines

2.6.2 Poor procurement

Three main challenges to rational procurement are poor quantification, opaque or corrupt procurement and tender practices and procedures, and poor financial management and payment methods. Inaccurate quantification is common in the absence of reliable data on illness and usage. It leads to shortages of essential medicines and other supplies and wastage; for example, owing to the purchase of stocks of medicines not used before their expiry dates. Poor payment systems and methods can lead to manufacturers refusing to fill subsequent orders and stock-outs — which can put the lives of thousands of people at risk. In addition, health care managers in many needed to develop sound procurement and supply plans — a critical part of Global Fund applications for financial support, as well as of good housekeeping. They may also be unaware of the numerous tools and methods available for quantification and procurement, be unaware of best practices and may choose uncertified suppliers. The result: poor quality medicines and other products are more likely to be purchased, causing patients and the general public to distrust health care providers and whole health systems.

2.7 New Trends in Healthcare Supply Chain

In the age of competition, no industry can survive without pondering much about reducing expenditures wherever possible. The same is true for health care industry, which is witnessing sharp rise in price in almost all its products and services. The alarmingly high pace of upward movement of cost is making the produce of the industry beyond the reach of the mass. Supply chain in this industry being a significant driver of cost is therefore grabbing all the attention from industry stakeholders. This study focuses on discussing the basic nature and components of supply chain of health care industry with considerable attention on future scopes along with present trends. The supply chain in this industry is believed to be inherently complex and as a result it is quite a tough task to recognize any magic

button that will help remove the inefficiencies to drive down costs. As part of the research for this paper we have done extensive studies of literatures and tried to gain insight on the complexity of health care supply chain management (SCM). The current trend shows that the industry struggles to meet on-time delivery. The major drawback remains in the fact that each part of the supply chain works independently, creating misaligned activities that prevents it from working as a system. We have also analyzed the health care supply chain in Malaysia to have a better understanding of the current scenario in developing countries. The literature review throws light on issues like redesigning of inventory management systems in hospitals, aggregation of suppliers and their products through electronic catalogues, use of ERP system to address another bottleneck in the supply chain, namely: inefficient information flow in the system. Finally the paper addresses certain new strategies emerging in the sector that are contributing towards efficient SCM practices.

They are: RFID, Supply Utilization Management, Virtual Centralization of the Supply Chain and Vendor Managed Inventory. The RFID helps attaining inventory visibility and accurate counts at every stage of the supply chain and also helps reducing shrinkage and shipping errors. Supply Utilization Management helps reducing wastages, value mismatch and misuse through standardization and proper specification. Virtual centralization of the supply chain on the other hand helps improving level of cooperation in hospitals thereby helping them controlling costs and improving services. How virtual centralization works is explained with the help of an example of CSC : this is jointly owned and managed by multiple hospitals and healthcare units. CSC brings together geographically dispersed healthcare units together and allows them to work together to attain maximum efficiencies in procurement, contracting and customer service. Presently hospitals are looking for new sources of competitive advantage and cost cutting measures wherever possible. It is imperative to look into the supply chain management aspects and identify areas in which they can improve the quality of service for efficient patient care. Supply Chain Management in healthcare should ensure complete end-to-end visibility of information among suppliers, manufacturers, distributors and customers. The healthcare supply chain involves the flow of many different product types and the participation of several stakeholders. The main purpose of the healthcare supply chain is to deliver products in a timely manner, in order to fulfill the needs of providers. Based on their functions, stakeholders in the healthcare supply chain can be divided into three major groups: producers, purchasers, and providers.

To add to the complexity of the system, there is also the involvement and participation of governmental institutions, regulatory agencies, and insurance companies (Ryan 2005). Primary manufacture involves the creation of the active ingredient contained within the medication. Because of the need to avoid contamination between products, there are long downtimes in production to allow for cleaning, leading to batch production (Shah 2004). In effect, this represents mass production. Secondary production sees the active ingredient converted into useable products (such as tablets, capsules, etc.) This can potentially lead to a significant expansion in the number of product lines, especially once packaging is taken into consideration. Altricher and Caillet (2004) suggest 200 times growth in products across this stage in the supply chain. With increasing globalization in the pharmaceutical industry, the location of manufacturing plants is often influenced by factors such as tax benefits (Papageorgiou 2001). Indeed, secondary manufacturing may be geographically separated from primary manufacturing and serve local or regional markets (Shah 2004). Turning to the distribution of finished products, there are a number of different channels to the market. The dominant intermediary (in terms of volume at least) is the wholesaler.

In the UK, approximately 80 per cent of volume flows through this channel (Shah 2004). Hospitals and retailers which have large demand requirements receive shipments direct from the manufacturer's distribution center. Equally, hospitals may leverage economies of scale by consolidating their purchasing power through, for example, Group Purchasing Organizations (Roark 2005). In terms of the characteristics of these supply chains, Shah (2004) provides detailed information with regards to typical performance levels. There are long lead times, with products taking between 1,000 and 8,000 hours to pass through the whole supply chain. Coupled with this, inventory levels appear quite high with stock turns taking between one and eight weeks. This is consistent with the findings of Haavik (2000) who reported that, in 1994, stock turns in hospital store rooms lasted four to five weeks. Another theme raised by several authors is demand amplification (Corrêa 2004, Shah 2004).

Given the number of intermediaries within the supply chain, and the presence of batching within primary manufacturing, this should perhaps be expected. The product flow (Figure 2) in the healthcare sector starts with the manufacturer and ends with the final customer at the healthcare provider. Depending on its type, a product can be directly delivered by the manufacturer to the healthcare provider, or channelled through a distributor before reaching the healthcare provider. The healthcare supply chain is frequently described as highly fragmented and relatively inefficient (Schneller and Smeltzer 2006). A major problem with the traditional healthcare supply chain is that each stage of the supply chain operates independently, leading to misaligned incentives and conflicting goals that prevent the supply chain from operating as a system. These conflicting goals, along with other barriers, have hindered the adoption and implementation of SCM practices.

2.8 Supply Chain Management Practices in the Healthcare Sector

Heinbuch (1995) described an approach to meeting the challenge of healthcare cost reduction through the hospital material management function. The work highlights the value of taking a proactive stance to meet the challenge of transferring technology across industry sectors. Alverson (2003) discussed the importance of disciplined inventory management for hospitals, and suggested serious consequences of traditional hospital purchasing including lack of inventory control, missed contract compliance, excess inventory levels, frequent stock-outs and costly emergency deliveries, workflow interruptions, expensive rework, and increased health system labor requirements. The literature on information technology (IT) provides some solutions to material management in the healthcare sector. Burns (2002) discussed aggregation of suppliers and their products through electronic catalogues, visibility of orders and materials, and efficiency in procurement. Schneller and Smeltzer (2006) suggested that e-procurement systems can help to significantly reduce purchasing costs through the consolidation of supplier networks and creation of supplier partnerships. They also suggested that transaction and administration costs can be reduced through the use of ERP systems, which provide an automated and paperless format for information to flow throughout an organization.

2.9 Current State of Supply Chain Management in Healthcare Industry

Within the healthcare industry, the supply chain associated with pharmaceutical products is critical in ensuring a high standard of care for patients and providing adequate supplies of medication for pharmacies. In terms of cost, it is estimated that supply accounts for 25-30 percent of operational costs for hospitals (Roark 2005). Therefore, it is essential that this is managed effectively to ensure both service and cost objectives are met. Various issues existing at the distribution element, particularly from the wholesaler to the hospital are as follows: Product life cycle: Once the active ingredient is patented, it may take eight years to develop the product into something that can be marketed (Papageorgiou 2001). Once the patent expires, alternative products may enter the market, or companies may reduce the product price (Lauer 2004). New technology is shortening life cycles creating new pressures on the distribution channels. Profit margins: Despite pharmaceutical products having a high value per unit, operating margins are small in the wholesaler sector particularly. One cause of this is the control over pricing held by hospitals, retailers and manufacturers (Lauer 2004).

Forecasting: It is difficult to predict the exact demand for medicines. One of the issues is the availability of accurate data on consumption. However, the lack of standard nomenclature for healthcare products, plus the preferences of clinicians creates further uncertainties (Lauer 2004). Lack of supply chain education: Awareness of the concept of supply chain management, particularly within hospitals, is low (Lauer 2004). Therefore, managers are not properly equipped to control the supply of medication. Given this context, a number of initiatives have been undertaken over recent years with a view to reducing supply chain costs and improving customer service. Initial improvements have been based around implementing just-in-time (JIT) approaches (Kowalski 1986). Subsequently, this has been developed further with the introduction of stockless inventory systems (Wilson 1992). The JIT and stockless approach can reduce inventory holding costs in the organization, while maintaining service levels (Lynch 1991). More recently, it has been suggested that the stockless system should only be used for high volume products, with a more traditional approach for low volume medical supplies (RivardRoyer 2002). However, there is a requirement for improved information and communication technology (ICT) systems to support this, along with automated processing of orders and suppliers (mainly wholesalers) close to the hospital to enable rapid replenishment. Both JIT and stockless approaches represent "pull" type inventory management systems.

2.10 Supply Utilization Management

Newly uncovered savings come not from reduced prices, but from eliminating waste, inefficiency, misuse, and value mismatches of the products, services, and technologies healthcare organizations employ. The following types of utilization misalignment are common in healthcare organizations. **Standardization;** Customizing products to customers' exact requirements can reduce an organization's supply chain expenses. Otherwise, the healthcare organization's money is wasted on unnecessary functions and features. Hence customization is preferred over standardization.

Over-specification; Hospitals often purchase products with components or features that are not medically, legally, or functionally required.

Under-specification; Too few components, wrong components, or missing critical features in products, services, and technologies are another common cause of utilization misalignment.

Value mismatches; many healthcare organizations bloat their supply budgets with costly products, services, and technologies that are not functionally required. These organizations often fail to look for available lower cost functional alternatives that can meet or exceed the customer's requirements.

New technology; All new technology needs to be closely monitored for at least three months to ensure that it is meeting or exceeding the manufacturer's performance specifications.

Old technology; All technology-whether elevators, IV pumps, anesthesia machines, or imaging systems-has a useful life of a certain number of years, and is not cost effective for the hospital to continue to maintain it beyond its useful life.

Vendor Managed Inventory (VMI); the supplier assumes responsibility for the management of inventory at the customer, and takes decisions regarding replenishment (Waller et al. 1999). To some extent, this builds on the information requirements of stockless inventory systems. The main difference is moving responsibility for stock control to the supplier, as the ordering process remains automated. For VMI to work successfully there is a need for accurate information on current stock levels and consumption. However, providing such information within hospitals can be difficult (Haavik 2000 and McKone-Sweet 2005). In Kim (2005), VMI has brought a number of benefits including less administration at the hospital, fewer errors, improved information reliability and a 30 per cent reduction in inventory. By contrast, Altricher and Caillet (2004) found that, because of a lack of trust in the supply chain, the hospital kept over-ruling the VMI system, holding more stock and eliminating any benefits that accrued.

2.11 Chapter Summary

Today, healthcare providers are under enormous pressure due to increasing competition, government regulations, rising costs, demand for higher quality of service. Undoubtedly, healthcare becomes tremendously complex as a business activity to manage diversified locations, changing organizational structures, mergers, employees, and multiple information systems across the globe. Healthcare organizations must strive for value addition across entire supply chain by monitoring supply chain performance. The latest innovations in RFID technology, Supply Utilization management & virtually centralized Supply chain management holds the key to the future. Looking to the future, supply utilization management is an emerging recommended practice that will enable healthcare organizations to dig deeper and more broadly into their supply chain expenses to harvest new and even better supply savings. Exploiting the power of RFID technology is not simply about replacing bar codes with tags. The specific benefits that RFID tags offer over bar codes present an entirely new way of working in the competitive business environment. To summarize: the health care industry is highly interdependent and only one part can't attain efficiency leaving behind others. That is the reason why strategy such as Virtual Centralization is proving to be popular and successful. That is not the end of the road, the industry has to look forward to each and every minute development in the supply chain of related industries to reap the benefit of being alert and quick to adapt to.

3.0 RESEARCH METHODOLOGY

This section describes the methodological approach to the study. It includes a description of the research design, population of the study, sample and the sampling technique. Also included is a presentation on the development of research instrument, data collection and analysis procedures.

3.1 Research Design

The research design of the study was a cross-sectional explorative study which utilized a non-probability, convenient sample and a structured questionnaire for the collection of quantitative data involving multiple variables which were analysed descriptively.

3.2 Population

The population for the study consisted of both administrative and non-administrative at the Regional Medical Store. The entire population size upon a preliminary visit to the place revealed that the total number of staff working in the office are about hundred (100).

3.3 Sample Size

Out of the population size of sixty (60) a simple random sampling will be used to select a sample size of forty (40) comprising of ten (stores) from procurement and stores department, ten (10) from account/ finance and ten (10) from management department.

3.4 Development of Research Instrument

The study's objectives and research questions basically informed the design of the questionnaire. Before the design of the questionnaire, a thorough literature search was also made to determine and categorize concepts and variables used in other studies which related to the topic of study. Information from the literature reviewed centered on issues related to supply chain challenges in health sector.

3.5 Sampling Technique

The purposive sampling technique was used to sample the respondents of the study. The advantage of the purposive sampling according to Bailey (2014) is that, it enables researchers to use their skills and prior knowledge of the subject to select respondents. In the application of this sampling method, Kumekpor (2012) advised selecting the units not through random procedures, but by intentionally picking them for the study. This is because they satisfy the selection criteria which are not randomly distributed in the population but are typical of the characteristics of interest to the study. In this study, respondents were chosen on the basis of their knowledge and experience in total quality management in their organization.

3.5.1 Questionnaires

It is set questions relating work, submitted to a number of people working in the organisation under study, in order to collect statistical information. The questions were administered to limit the respondent for easy analysis. That is where a list of answers will be given out to enable respondents choose any, considered appropriate. When you ask a question you intend to find out: Why something took place - why did that happen? When something took place – when did that happen? The open ended questions were used to enable the respondent use his/her discretion in answering the questions. The questions also give the respondent an opportunity to make further clarification in his or her answers. For example, asking a respondent to comment on an opinion about a potential supplier.

3.6 Data Collection

Data for the study was collected over a two-week period in the month of April. Quantitative data was primarily sought for the study. Data will be obtained through the use of a structured questionnaire appropriately and specifically designed for the study. The response categories of the various questions (variables) were mostly pre-coded. One (1) researcher assistant was recruited and trained by the researcher to assist in the data collection. The data collected was managed by the research assistant under the supervision of the researcher.

3.7 Data Analysis

Data once cleaned was again analysed using the Statistical Package for Social Scientist (SPSS v20) software programmer. The analytic strategy used in the study will primarily inform by what best fits the data, instead of a technique chosen beforehand. Based on appropriateness and the explorative nature of the study, descriptive statistics such as frequencies and percentages were mostly utilized.

4.0 Data Analyses

This chapter explains information gathered from the field through questionnaires. These are analysed to emphasize response from respondents using tables to enhance clearer and consistent understanding of the analysis. This chapter is also divided into sub-headings to throw more light on questions asked on the field.

4.1 Administration of Questionnaires and Interviews

A total number of fifty (50) questionnaires were administered out of which forty (40) were retrieved. These valid questionnaires used for the analysis yielded 80% of response rate. This indicates that, the response rate was high and reflects the entire views of the population.

Demographic Coverage of Respondents: The researchers selected the sample based on targeted units using the non-probability sampling method of random sampling, specifically the purposive sampling technique. This method ensured that representative samples of all the known elements of the population were covered in the sample.

Gender Distribution of the Respondent

Table 4.1 Respondents Distribution

Details	Male		Female		Total	
	Frequency	Percent (%)	Frequency	Percent (%)	Count	Percent (%)
Staff of the Regional	8	20.00	12	30.00	20	50.00

Medical stores						
Regional Hospital Koforidua	14	35.00	6	15.00	20	50.00
Total	22	56.00	18	44.00	40	100.00

Source: Author's own fieldwork, 2018

Table 4.1 above is a table showing the group that the various respondents' falls under. Out of the 40 respondents, 22 respondents representing 56% are males. 18 respondents representing 44% of the respondents are females. The skewed result in favour of male may be attributed to the purposive sampling technique used for the selection of the respondents. Nevertheless, it should also be noted that, across all the sections or departments of which the sample were taken, were heavily male dominated. This would however have no effect on the general outcome of the results for this study. More males however can be said to dominate the profession when compared to the females.

Age of the Respondents

Table 4.2 Age Distribution

Age	Frequency	Percentage (%)
20-29years	17	42.5
30-39years	16	40
40-49years	5	12.5
50-59years	2	5
Total	40	100

Source: Author's own fieldwork, 2018

Table 4.2, indicates that 17 respondents representing 42.5% of the total respondents falls between the ages of 20-29years, 40% of response rate representing 16 respondents also fall between the ages of 30-39years, while 12.5% of responses rate falls between the ages of 40-49years. Finally, 2% of responses rate out of the total questionnaire retrieved falls between the ages of 50-59years. From the above analysis, it could be seen that, majority of the respondents if not all were matured to provide the needed information to enhance the analysis

Education Backgrounds of Respondents

Table 4.3 Education Background

Qualification	Frequency	Percentage (%)
JHS/Middle School	4	10.0
SHS/Sec/Tec/Vocation	5	12.5
Diploma/HND	13	32.5
Bachelor	16	40.0
Masters	6	15.0
Total	40	100

Source: Author's own fieldwork, 2018

Table 4.3 indicates that, all the respondents selected were well educated, it was found that, majority of the respondents were holders of Bachelor's Degree, which constitute 40%, Diploma/HND holders followed this, which also constitutes 32.5%. SHS/SEC./Voc./ Technical constitutes 12.5% while Master Degree holders constituted 15% and the minority was the holders of JHS/Middle School, which constitute 10%. The analyses shows that the Regional Medical stores and the Hospital have some level of acceptable qualification to properly manage and control the activities of the institution under study and this undoubtedly is in support of what Marx (2002) said concerning level of qualification in respect to achievement of organizational goals in an organization. According to Marx dealing with change and more importantly the impact of change, is a high priority for all organizations to pay maximum respect to the level of qualification and the skills of the employee in the sense that this contribute immensely to the achievement

of organizational goals and confirmed by Pfiffner and Presthus (2000) which compared level of education and productivity.

Working experience

Table 4.4 Working experience

Working experience	Frequency	Percentage (%)
Less than 1year	1	2.5
1-3years	14	35.0
4-6years	14	35.0
7-9years	7	17.5
Above 10years	4	10.0
Total	40	100

Source: Author’s own fieldwork, 2018

It shows that majority of work experience of the respondent falls between 1-3yrs and 4-6yrs representing 35% each; 7-9years of work experience of the respondents were also represented by 17.5%. 4% of response rates are above 10yrs. Finally, the minority of the work experience of the respondents is represented by 2.5% and that is less than a year. There was a good indication according to table 4.4 that, those managing general goods at the both institutions have experience therefore there is expectation that they will do the right thing.

4.5 Department of the respondents

The researcher also considered the departmental levels of the respondents to establish how it relates to the Challenges of supply chain of health commodities. The findings are presented in the table below.

Table 4.5 Department of respondents

Frequency	Percent%
Stores	62.5
Management	12.5
Accounts	25.0
Total	100

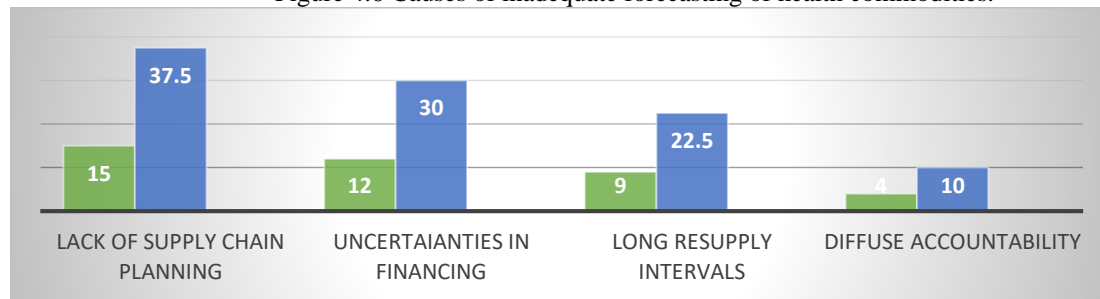
Source: Author’s own fieldwork, 2018

From the table 4.5, overwhelming 62.5% of the respondents were from stores department, 12.5% were from Management, 25% were also from Account department.

Objective 1: To identify the causes of inadequate forecasting of health commodities in the supply chain.

The researchers’ identified the causes of inadequate forecasting of health commodities in the supply chain as it contribute greatly to the effectiveness of the organization.

Figure 4.6 Causes of inadequate forecasting of health commodities.

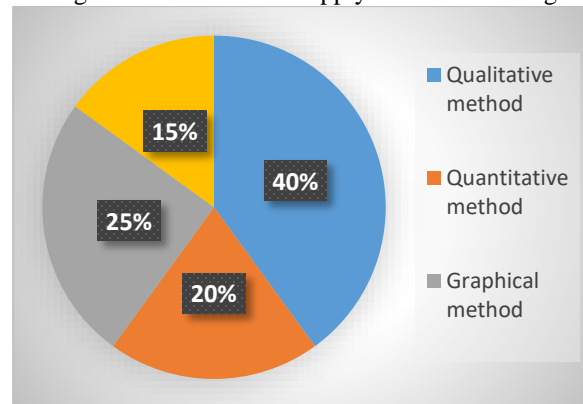


Source: Author’s own fieldwork, 2018

Evolved from figure 4.6, it is evident that 15 respondents representing 37.5% believed that the causes of inadequate forecasting of health commodities is as a result of lack of supply chain planning, 12 respondents

representing 30% are of the view that uncertainty in financing causes inadequate forecasting of health commodities, 9 respondents representing 22.5% said the causes of inadequate forecasting of health commodities is as a result of long resupply intervals whilst 4 respondents representing 10% instigated, the causes of inadequate forecasting of health commodities is as a result of diffused accountability.

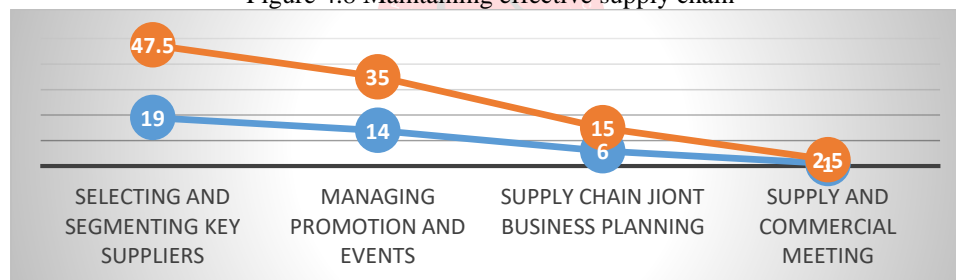
Figure 4.7 Methods of supply chain forecasting



Source: Author's own fieldwork, 2018

According to figure 4.7, 16 respondents representing 40% are of the view that regional medical stores use qualitative methods of forecasting, 8 respondents representing 20% said regional medical stores use quantitative methods of forecasting, 10 respondents representing 25% believed that regional medical stores use graphical methods whereas 6 respondents contributed that regional medical stores use trend forecasting methods.

Figure 4.8 Maintaining effective supply chain

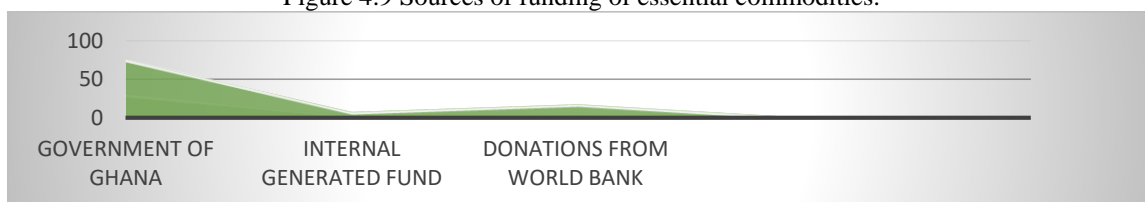


Source: Author's own fieldwork, 2018

In relation to figure 4.8, it is ostensible that 19 respondents representing 47.5% said, effective supply chain is as a result of selecting and segmenting key suppliers, 14 respondents representing 35% believed that, effective supply chain is as a result of managing promotion and events, 6 respondents representing 15% opted, regional medical stores maintain an effective supply chain through supply chain joint business planning whilst 1 respondent representing 2.5% believed effective supply chain is as a result of supply and commercial meeting.

Objective 2: To assess the factors that causes inadequate funding of health commodities in the supply chain of regional medical stores.

Figure 4.9 Sources of funding of essential commodities.



Source: Author's own fieldwork, 2018

Germane to figure 4.9, 30 respondents representing 75% instigated that government if Ghana funds essential commodity at regional medical stores, 3 respondents representing 7.5% briefed that, regional medical stores funds their momentous commodities through internally generated funds, 7 respondents representing 17.5% are of the view that, they fund their momentous commodities using donations from world bank.

Table 4.10 Factors that causes inadequate funding of health commodities in the supply chain of regional medical stores.

Factors	Frequency	Percentage (%)
Improper capital decision	8	20
Lack of access to credit	2	5
Shortages of skilled manpower	3	7.5
Poor internal management	7	17.5
Lack of proper financial records	6	15
Change of government	7	17.5
Lack of information sharing	3	7.5
Poor accounting records	4	10
Total	40	100

Source: Author's own fieldwork, 2018

Lack of funds to fuel an establishment causes jeopardy. Prior to that, the researchers had ample time to fathom some of the causes of inadequate funding at regional medical stores. Table 4.10 indicates that, 8 respondents representing 20% said that inadequate funding is as a result of lack of capital decision, 2 respondents representing 5% are on the side of lack of access to credit, 3 respondents representing 7.5% also said is as a result of lack of skilled manpower, whilst 7 respondents representing 17.5% believed it as a result of lack of internal management, 6 respondents representing 15% among others are of the view that, it's as a result of improper keeping of financial record. Whence, 7 respondents representing 17.5% instigated it's as a result change of government, 3 respondents representing 7.5% believed it's as a result of lack of information sharing and 4 respondents representing 10% opted that, lack of funding is as a result of poor accounting records.

Objective 3: To investigate the problems associated with sharing of information between regional medical stores and other health facilities.

Table 4.11 Challenges associated with sharing of information

Statement	Strongly agree	Agree	Strongly disagree	Disagree	Neutral
Lack of perceived benefits of information sharing	14(35.0%)	14(35%)	8(20%)	3(7.5%)	1(2.5%)
Lack of trust and of confidence in information sharing system	16(40.0%)	10(25%)	5(12.5%)	5(12.5%)	4(10%)
Lack of accuracy and credibility of information	2(5%)	21(50%)	8(20%)	8(20%)	1(2.5%)
Financial constraints for high cost of maintenance	15(37.5%)	14(35%)	3(7.5%)	6(15%)	2(5%)
Lack of willingness and sharing spirit among employee	11(27.5%)	17(42.5%)	8(20%)	3(7.5%)	1(2.5%)

Source: Author's own fieldwork, 2018

Table 4.11 shows response of respondents, another multiple response questionnaire administered to respondents to ascertain Challenges of supply chain of health commodities in the health service. It is important to note that most of the staff at Regional Medical Stores is challenges with lack of perceived benefits of information sharing.

Thus, 14 respondents representing 35% strongly agreed, 14 respondents representing 35% agreed, 8 respondents representing 20% strongly disagreed, 3 respondents representing 7.5% disagreed and 1 respondent representing 2.5% stands at neutral to the statement. In addition, lack of trust and of confidence in information sharing system are considered as challenge confronting respondents.

Whence, 16 respondents representing 40% strongly agreed, 10 respondents representing 25% agreed respectively, 5 respondents representing 12.5% strongly disagreed, 5 respondents representing 12.5% disagreed, 4 respondents representing 10% are neutralized people. On the issue Lack of accuracy and credibility of information, 2 respondents representing 5% strongly agreed, 21 representing 50% agree respectively that they consider this option one of the challenges.

Again, quite a number, 8 respondents representing 20% strongly disagreed, 8 respondents representing 20% do not take this issue as a challenge, 1 respondent representing 2.5% are not sure if the challenge Financial constraints for high cost of maintenance, it is not surprising to know that the staff are much concern in this regard. Analytically, overwhelming 15 respondents representing 37.5% strongly agreed, 14 respondents representing 35% agreed respectively, 3 respondents representing 3.5% strongly disagreed, 6 respondents representing 15% disagreed to the statement and 2 respondents representing 5% are not sure of the challenge. 11 respondents representing 27.5% strongly agreed that Lack of willingness and sharing spirit among employee is also another great challenge at regional medical stores, 17 respondents representing 42.5% agreed, 8 respondents representing 20% strongly disagreed, 3 respondents representing 7.5% disagreed, 1 respondent representing 2.5% are ambivalent about the challenge.

Objective 4: To determine to the challenges associated with delivery of health commodities from regional medical stores to other health centers.

Table 4.12 Challenges associated with delivery of health commodities

Challenges	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
Difficult implementation of supply chain collaboration	2(5%)	3(7.5%)	3(7.5%)	17(42.5%)	15(37.5%)
Failure to identify effective partners for collaboration	-	3(7.5%)	4(10%)	12(30%)	21(52%)
Lack of responsiveness & flexibility in procurement	-	-	-	9(22.5%)	31(77.5%)
Real time information sharing	-	-	5(12.5%)	11(27.5%)	24(60%)
Lack of integrated strategy	1(2.5%)	2(5%)	7(17.5%)	11(27.5%)	19(47.5%)

Source: Author's own fieldwork, 2018

Effective delivery of goods and services is pivotal to all organizations as it contributes highly to the achievement or organizational objective. Whence, identifying weaknesses or factors that will cheapen the organization from achieving its strategic goal, finding remedies or putting in place measures is preeminent. Germane to table 4.12, it ostensible that, difficulty in implementation of supply chain collaboration is a challenge. Thus, 2 respondents representing 5% strongly disagreed to the above challenge, 3 respondents representing 7.5% disagreed, 3 respondents representing 7.5% are not sure, 17 respondents representing 42.5% agreed whilst 15 respondents representing 37.5% strongly agreed to the fact that the above challenge contributes to ineffective delivery goods and services. Taking into account failure to identify effective partners for collaboration, 3 respondents representing 7.5% disagreed to the challenge, 4 respondents representing 10% are ambivalent about the challenge, 12 respondents representing 30% concurred, and 21 respondents representing 52% were ion strongly agreement of the veracity that the challenge cheapens the delivery. Lack of responsiveness & flexibility in procurement as another challenge, 9 respondents representing 22.5% agreed to the challenge, whilst a gigantic 31 respondents representing 77.5% strongly concurred to the above challenge. Real time information sharing, 5 respondents representing 12.5% are not sure of the challenge

weather it cheapens delivery, 11 respondents represent 27.5% agreed to the fact the challenges embroils delivery and 24 respondents representing 60% strongly concurred.

Tofo, lack of integrated strategy as another challenge, 1 respondent representing 2.5% strongly disagreed that the challenge embroils delivery of goods and service, 2 respondents representing 5% disagreed, 7 respondents representing 17.5% are ambivalent as to if the challenge shrinks delivery, 11 respondents representing 27.5% were in agreement whilst 19 respondents representing 47.5% strongly agreed.

5.0 CONCLUSION

This chapter deals with a summary of the main findings, conclusion and recommendations of the study. In order to justify the findings of the study, the chapter also discusses the findings in the light of field notes taken; visual observations made and relate it to previous studies done on refrigerated drug management. It is well-established fact that, all critical and major medical commodities insufficiencies are attributed to the control and monitoring of causes and challenges (Blake, 2008).

5.1 Summary of Finding

This study clearly indicated that stock outs of essential medicine occur consistently at regional medical stores and was clearly affirmed by 52.5% of the total response rates while 35% of the respondents rebuff the statement. The researchers can confirm that maintaining appropriate storage condition in the event of a power failure is positive because regional medical stores have a standby generator to cater for interrupted power outage in this unstable power conditions. This statement was affirmed by overwhelming 95% response rate. It was revealed that warehouse infrastructure is not adequate according to the storage requirements for medical commodities as about 75% of the respondents rates affirmed to this statement. Also about 10% of the respondent's put-down the statement. The study reveal the lack of suppliers for some essential Commodities, bureaucratic Procurement Processes, there is high demand for product, lack of space to store the commodities and lack of data on consumption as the causes of inadequate forecasting of health commodities at the health facilities.

Lack of perceived benefits of information sharing, lack of trust and of confidence in information sharing system, lack of accuracy and credibility of information, financial constraints for high cost of maintenance and lack of willingness and sharing spirit among employee are the challenges discovered during the study.

5.2 Conclusion

Effective health commodities management has a great impact on the efficiency and effectiveness of the service delivery in this country not forgetting the case in this study as the research brought to the fore. However the knowledge, practice and implementation of strategies of this all-important concept was existent but on a much lower scale. Irrespective of the level of strategies adopted in the study area, there is still more room for improvement. The importance of this industry grows stronger every day and the way forward for an improved service delivery is by making sure that health commodities are managed effectively. The sensitization of this entire important concept is very important and should be taken up by the appropriate bodies that have the welfare of the people at heart.

5.3 Recommendation

Objective 1: To identify the causes of inadequate forecasting of health commodities in the supply chain.

Based on the findings of this study, Regional Medical Stores should get experts in the field of health commodities management to do refresher courses for their Supply officers as well as make it a point to make the knowledge on this concept known to every staff member of other departments for an improved health service delivery.

Objective 2: To assess the factors that causes inadequate funding of health commodities in the supply chain of regional medical stores.

The researchers would like to recommend that funds are made available by the responsible bodies on time and internal beauraucracy is checked to ensure the effective management of commodities in these facilities.

Objective 3: To investigate the problems associated with sharing of information between regional medical stores and other health facilities.

In general, stakeholders should focus on well-functioning transport management systems and inventory management policies, with strong political involvement, clear responsibilities and roles, good supervision systems and adequate budgeting. Examples include aspects such as building up knowledge in innovative ways, providing easy access information, creating awareness about the importance of guidelines and standardization, designing appropriate

process performance indicators, focusing on regular monitoring, hiring dedicated employees for quantification and using new technologies to enhance efficient communication, real time tracking and data transfer.

Objective 4: To determine to the challenges associated with delivery of health commodities from regional medical stores to other health centers.

Physical inventory should be undertaken on a regular basis and the results entered onto the stock tally cards. A review of the max and min levels should take place and all those involved in the management of health commodities should be trained in inventory control methodology. Standard operating procedures should be established in medical stores and a procedures manual produced. The warehouse should be expanded to accommodate the increase demand of the commodities. RMS should procure commodities with longer expiring dates and facilities must be supported to effect payment of goods delivered on time.

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