SUPPLY CHAIN MANAGEMENT PRACTICES AND STOCK LEVELS OF ESSENTIAL DRUGS IN PUBLIC HEALTH FACILITIES IN BUNGOMA EAST SUB-COUNTY, KENYA

SUBMITTED BY: SIMON SAUNDU MUNGU

SUPERVISOR: GERALD ONDIEK

A Research Project submitted to the Graduate School in Partial Fulfilment of the Requirements for the Award of Master of Business Administration of the University of Nairobi.

NOVEMBER 2013
Declaration and Recommendation

Declaration

This Research Project proposal is my original work and has not, wholly or in part, been presented for an award of a diploma or degree in any other university.

Students Name__________________________________________________

Registration Number: D61/60624/2011   Signature ________________

Date ________________

Recommendation

This research has been submitted for examination with my approval as University supervisor

Name of supervisor_______________________________________________

Signature ________________________________________________________

Date ___________________________
Acknowledgement

First, a very special and enormous thanks to my supervisor, Mr. Gerald Ondiek for his guidance and invaluable support during the writing of this project. I also express my gratitude to other members of the department of procurement and supply management and other people I have met along the way for their support and encouragement.
Dedication

I would to dedicate this work to my wife and children for their encouragement, understanding and moral support while carrying out the study.
Abstract
Supply chain management practices correctly applied in Public Health Institutions can contribute greatly in maintaining the availability of essential drugs in public health institutions. A number of studies have been carried out in the field of supply chain management targeting different industries but no studies have focused on the availability of drugs in public health institutions in general or in a particular Kenyan sub county region. This study therefore assessed the effect of supply chain management practices on the stock levels of essential drugs in public Health Institutions in Bungoma East sub-county. This was a census study of all the 15 public health institutions in Bungoma East Sub-County on supply chain management practices and the stock levels of essential drugs. A structured questionnaire set in Likert scale format was used to collect the data. Most of the practices that were studied scored highly apart from the tendering requirement by public procurement and disposal act 2005 and regulation 2006. The assertion that KEMSA drugs are cost effective were strongly upheld. Market price fluctuations was identified as the most challenging factor that could affect stock levels of essential drugs in health facilities in Bungoma East sub-county. Findings from this study indicate that as currently practiced public procurement is not effective in reducing the cost of drugs. Therefore there is need to evolve, for example to e-procurement which saves the costs of the preparation and transmission of paper purchase requests and invoices and thus eliminating costly, time-consuming errors from manual data entry. To ensure steady, accessible and affordable stock of essential drugs, the supply chains need to be cushioned against price fluctuation. Adequate funding of the sector is also recommended.
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<td>CIPS</td>
<td>The Chartered Institute of Purchasing and Supply</td>
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<td>GFATM</td>
<td>Global Fund to Fight AIDS, Tuberculosis, and Malaria</td>
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<td>GOK</td>
<td>Government of Kenya</td>
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<td>Kenya Medical Supply Agency</td>
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CHAPTER ONE: INTRODUCTION

1.1 Background

Supply chain management practices correctly applied in public Health Institutions can contribute greatly in maintaining the availability of essential drugs in public health institutions. Firms hold inventory (Stock) for two main reasons, to reduce costs like logistics costs and to improve customer service. The motivation for each differs as firms balance the problem of having too much inventory (which can lead to high costs) versus having too little inventory (Which can lead to cost of lost sales) (King and Phumpiu, 1996)

One of the policies that guide Kenyan’s, public health facilities is to always keep in stock an identified limited range of drugs that can manage the most prevalent diseases around. These are called Essential drugs. The supply chain sequence begins with the basic suppliers of raw materials and extends all the way to the final consumers. Facilities include; Warehouses, processing centers, distribution centers, retail outlets or service centers. Function and activities include forecasting, inventory management, information management, quality assurance, scheduling, production, distribution, delivery and customer service (Stevenson, 2007).

Supply chain management is a business practice that aims at improving the way a business sources its raw materials, and delivers its final product to the end users. Warner (2002) claims that Forrester is the true father of the philosophy of supply chain management. Further Hugo et al (2004) noted that it is a further development in managing the supply base and therefore a development of the purchasing function. Kottler (2005) believes that physical distribution (logistics) has been expanded into
the broader concept of supply chain management. Besides logistics, other functional areas such as marketing, finance, and operations management made an equally significant contribution (Hugo et al., 2004). Despite the fact that there is no generally agreed definition, supply chain management is generally intended to cover all business processes between vertically linked organizations (Bowersox et al.; 1999, Lambert et al. 1998; Bask and Juga 2001).

Efficient public health supply chain performance is essential for assuring access to health supplies, and thus for positive health outcomes. This is particularly important in most countries in sub-Saharan Africa where a large proportion of the population is served by the public and mission health sectors. The public/mission health supply chain manager therefore has an essential role in the realization of global public health goals, for improving maternal health, reducing child mortality, and combating HIV/AIDS, malaria, and other diseases. Rapidly increasing health assistance from multilateral and bilateral donors has significantly benefited health programs, but has also resulted in huge increases in the quantity and value of commodities flowing through public health supply chains — a trend that will continue as newly developed products (many with demanding supply chain requirements) continue to be introduced into developing countries health systems.

Stock control, otherwise known as inventory control, is used to show how much stock one has at any one time, and how to keep track of it. It applies to every item used to produce a product or service from raw material to finished goods. It covers stock at every state of the production process, from purchase and delivery to using and re-ordering the stock. Efficient stock control allows one to have the right amount of
stock in the right place at the right time. It ensures that capital is not tied up unnecessarily and protects production if problems arise within the supply chain.

The study sets to determine the effect of supply chain management practices on the stock levels of essential drugs in public health institutions in Bungoma East Sub-county. Bungoma East Sub-county is geographically situated in western part of Kenya.

The government administered health institutions in Bungoma comprise of District Hospitals, Health Centres and Dispensaries Categories.

1.1.1 Supply Chain Management Practices

Lyson and Farrington (2006) points out that supply chain management can be summarized to mean the management of all activities, information, knowledge and financial resources associated with the flow and transformation of goods and services up from raw-materials suppliers, components suppliers, and other suppliers in such a way that the expectation of the users and the organizations are met or surpassed.

David, et al, (1997) identify seven principles (Practices) of supply chain management that applied together can enhance revenue, assets utilization as well as customer satisfaction. These principles are: The 5 rights- The buyer ensures that materials or goods are of the right quality, the right quantity are delivered to the right place at the right time for the right price; Cost Management- that purchasing efficiency and effectiveness contribute to organization’s cost saving and hence bottom line profit. This achieved by considering total cost of ownership and by putting in place efficient and effective delivery system and inventory management.
Thirdly Supplier management, which means building a cordial working relationship between the purchasing organization and the supplier. Managing proactively by anticipating future needs and amicably resolving disputes that arise during the contract (The chartered institute of purchasing and supply). Fourthly Quality Control-Supply chain quality management is a system based approach to performance improvement that integrates supply chain partners and leverages opportunities created by upstream and downstream linkages with focus on creating value and achieving satisfaction for intermediate and final customer (Foster, 2008, Robin and Malhotra, 2005). For the purchaser, this starts with selecting the right supplier after a due suppliers analysis process and subsequent continuous contract performance evaluation.

The fifth principle is specification-Correct Specification serves two purposes; to communicate the buyer’s need and to establish the criteria by which to judge what is eventually delivered. Next is Price negation- a professional purchaser goes into price negation having undertaken a purchasing research on demand analysis, vendor analysis and supply market analysis. This provides information so that the firm can adapt to changes in supply environment and ensure competitive advantage on opportunities (CIPS). Lastly use of technology whereby the use of electronic methods (the internet) by the buyer to undertake sourcing and procurement of goods and services. The use of technology integrates chain members, the supplier, the buyer, and the customer for efficient and effective supply chain management.

If the role of supply chain management is elevated and incorporated in the overall strategy, then it can be used to enhance the overall performance by improving the effectiveness of available assets and resources. At the same time, balancing the needs
of the clinical staff that are at the core of the healthcare sector with the needs of supply chain function is a complex task. This task has become more challenging in recent years due to the increased involvement of different stakeholders in health at both national and international level.

1.1.2 Stock Levels

Inventory management is influenced by the nature of demand including whether demand is derived or independent. Inventory levels are affected by customer service expectations, demand uncertainty, and the flexibility of the supply chain (Ballou, 2004). For products characterized by erratic demand, a short life cycle or product proliferation, a more responsive supply chain and larger buffer inventories may be needed to meet a desired customer service level.

Inventory costs fall into three classes: carrying costs of regular inventory and safety stock, ordering or set up costs, and stock-out costs. Inventory control systems balance the cost of carrying inventory against the cost associated with ordering or shortfalls. Service level goals can differ by the value placed on stock-outs and indirectly carrying costs. A high cost of stock-out valuation will result in higher inventories and higher service levels. A constant availability of stock provides a continuous uninterrupted customer service. The Item Fill Rate (IFR) Measures how a particular by product (Often called a stock keeping unit or SKU) is available (Wilson, 2004). Stock levels should be maintained to minimum level so as not to incur unnecessary stock holding cost but always available for continuous service to customers. Careful analysis can identify an economic order quantity (EOQ), being the quantity of an item
that should be regularly ordered so as to minimize total cost of ordering and holding cost.

1.1.3 Essential Drugs

World Health Organization defines essential drugs (medicines) as those that meet the priority health care needs of the population, carefully and systematically selected using evidence based process. Regard is given to public health relevance, clear evidence on efficiency and safety and comparative cost effectiveness. These drugs are meant to be always available in a functioning health care system in adequate amounts, appropriate dosage forms with assured quality and adequate information.

1.1.4 Medical Supplies Guideline

The Kenya Medical Supplies Agency (KEMSA) is the sole supplier of all pharmaceuticals and other medical products for the 3,936 facilities in the public health sector in the country.

KEMSA is a semi-autonomous public sector institution under MoMS with supply management responsibilities that include sourcing, purchasing, and distributing pharmaceuticals and health supplies on behalf of GOK. The overall aim of the state-run drug distribution system is to make them accessible and affordable to Kenyan users of public health services.

All procurements conducted by KEMSA are governed by the Kenya Public Procurement and Disposal Act (2005), and annual procurement plans for essential drugs and commodities are prepared by KEMSA and various health departments. KEMSA uses manual systems and procedures for procurement. These do not offer
reliable and accurate management information which is a key factor in ensuring transparency across the entire procurement process. KEMSA currently procures and distributes over 1,173 products ranging from essential drugs, donated program drugs, medical consumables, and other specialty consumables such as X-ray and dental materials under a centralised model.

In addition to bureaucratic challenges, there is also a perception among some private sector representatives that in the past there has been a lack of transparency around some of KEMSA’s procurement activities. The combination of these factors has positioned KEMSA as potentially non-competitive in the private sector in the current context.

As a general rule, KEMSA purchases pharmaceutical products using an open tender system where the vendor who meets the selection criteria and offers the lowest price gets awarded. The GOK has put forward a policy to promote local pharmaceutical manufacturing and part of this policy is the regulation stipulating that KEMSA purchase products from local manufacturers at prices up to 115% of the lowest price offered by an international supplier. In practice some non-compliance with this regulation has been observed, with KEMSA continuing to source internationally despite local availability of a drug, which has led to some discontent among local manufacturers.
1.1.5 Public Health Facilities

The Kenyan public health system is administered by the ministry of health from the top down. The health facilities are distributed regionally, with the most sophisticated services available at the national Referral and Teaching Hospitals (NRTH), Kenyatta National Hospital, Nairobi and Moi Teaching and Referral Hospital, Eldoret. The next best level of care is found at the provincial level hospitals, followed by district and sub-district hospitals. Below that are the health centers and dispensaries.

1.1.6 Bungoma East Sub County

Bungoma East Sub County is geographically situated in western Kenya. There are 15 public health facilities in Bungoma East Sub County. These are 1 District Hospital 1 Sub District Hospital 2. Health Centres and 11 Dispensaries. The drug supply chain managers are the pharmacist and pharmaceutical technologists at the District and sub district Hospitals. At the health centers and dispensaries level it is the clinical officer or the nursing officer in charge.

1.2 Research Problem

Many studies recognize that an effective SCM is a powerful tool to achieve cost advantage and a more profitable outcome for all parties within and beyond any organization (Davis, 2008). In the health sector an effective SCM management will contribute considerably to constant availability of medical supplies, more so medicines in particular, which are important items in health service delivery. Bungoma East sub county Health facilities, like all other public health facilities in
Kenya are ideally supposed to be getting all the medicines requirement from the Kenya medical supply Agency (KEMSA)

KEMSA is a specialized Government medical logistics provider for ministry of Health supported health facilities and programmes in Kenya. KEMSA was established as a state corporation under Cap 446, through the Kenya medical supplies Agency order 2000 (Legal Notice No. 17 of 11th Feb, 2000). It plays the role of procuring, storing and distributing health commodities for the public health sector. But the supplies from KEMSA are always short of the requirements of the public health institutions, Bungoma East Sub-county included. This has forced the public health facilities in Bungoma East sub-county to be purchasing a substantial portion of essential drugs requirements from the local pharmaceutical stores using revenue they get from the public health facilities cost sharing initiative.

To procure medicine locally public health facilities have to go by the guidelines given by Public Procurement Oversight Authority (PPOA) which was created after the enactment of procurement and disposal Act 2005 and Regulations 2006. Part of the guidelines requirements is competitive tendering for needed purchases.

A number of studies have been carried out in the field of supply chain management targeting different industries. For example Moenga (2011) focuses on SCM practices and challenges for small scale tee sector in Kenya. Otile (2011) focuses on SCM practices used in the cosmetic industry in Kenya, and Gitau (2011) on SCM malpractices in the Kenya public sector. But to the extent of the researcher’s literature review, no studies have focused on the availability of drugs in public health institutions in general or in a particular Kenyan sub county region. Therefore the
research question for this study is what is the effect of supply chain management practices on the stock levels of essential Drugs in public Health Institutions in Bungoma East sub-county?

1.3 Research Objective

To determine the effect of supply chain management practices on the stock levels of essential drugs in public Health Institutions in Bungoma East sub-county.

1.4 Value of the study

The study will be a contribution to the increase of the general knowledge of the subject and will act as a reference material for future researchers and scholars interested in related studies.

As a contribution to government policy formulation that would enable constant availability of medical supplies in public health institutions. This will result in improved service provision in the health sector. As well as the study will assist in their endeavor to utilize supply chain management practices to improve inventory management in their organizations.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter gives the literature review done by the researcher. The reviewed literature covers supply chain management, inventory management, stock levels, challenges in the health care system and supply chain management.

2.2 Supply Chain Management

Supply chains are critical in defining the ultimate cost and accessibility of medicines. A well-functioning health supply chain provides broad geographic access to affordable, high-quality products. In addition, good supply chains operate with efficiency, adaptability, and financial integrity. At public sector health facilities, average availability is roughly 38 percent; and at private outlets, where products are often unaffordable to most of the population, availability is still under 60 percent (WHO/HAI 2008; Asante, Aikins. 2008).

Supply chains underpin the entire health system and are essential for providing consistent availability of affordable, high-quality diagnostic and treatment products in locations that are geographically accessible to the target population. In addition, supply chains carry information about supply and demand for products back to planners and policymakers and handle financial flows so that the system is adequately resourced. A broken supply chain can cripple the health system and undermine positive health outcomes.

Supply chain management has several principles which when practiced in an integrated manner improve the way an organization sources its raw materials or
goods and delivers its final product or the goods to the end user. According to Anderson, Britt, and Favre (1997) supply chain management addresses the following problems.

First, distribution network configuration including number, location and network missions of suppliers, production facilities, distribution centers, warehouses, cross-docks and customers. Second, Distribution Strategy: question of operating control (centralized, decentralized or shared); delivery scheme and transportation. Third, trade-offs in logistical activities: The above activities must be well coordinated in order to achieve the lowest total logistics cost. Trade-offs may increase the total cost if only one of the activities is optimized. Forth, Information: integration of processes through the supply chain to share valuable information, including demand signals, forecast, inventory status, transportation scheduling. Also inventory management, and cash flow: Arranging payment terms and methodologies across entities within the supply chain.

Turban et al. (2004), assert that there are several important problems in SCM that need to be resolved for efficient operation. Most of those problems stem either from uncertainties or inability to coordinate several activities and partner. They note that one of the most common problems in supply chain is the so called bullwhip effect. Even small fluctuations in the demand or inventory levels of the final company in the chain are propagated and enlarged throughout the chain. It has been proved that in the face a competitive global market, organizations have downside, focused on core competencies and attempted to achieve competitive advantage by more effectively managing all internal and external value-adding activities. Many firms have reduced their supply base so that they more effectively manage relationships with strategic
suppliers Tully (1995). Mason (1996) and Copacino (1996) indicate that buying firms are developing a mutually beneficial relationship with suppliers and viewing suppliers as virtual extensions of their firm.

2.3 Inventory Management

Part of inventory management in a health facility set up is to ensure an optimal stock level of medicines in general and Essential Medicines in particular so as to enable a satisfactory service to the clients. Unfortunately in most organizations in the healthcare sector in developing countries, the supply chain is not accorded central role in the overall strategy of the organizations. For example, the National Malaria Strategy for Kenya lacked supply chain component until it was reviewed in 2009. Due to this omission, supply of Malaria commodities was erratic inspite of good planning at the program level. There was a clear mismatch between commodity availability at central level and to health facilities. Health facilities in the periphery would run out of anti-malarial stocks for months even when the central stores had sufficient stocks.

With an annual budget of roughly 10bn Kenyan Shillings, KEMSA supplies all public facilities in the country with medicine, non-pharmaceutical supply, and medical equipment free of charge. An estimated 12-13M USD was spent for KEMSA-supplied, co-paid ACT in the previous financial year, for about 9M adult and 4.3M pediatric treatment doses.14 This is still by far the largest share of the total co-paid ACTs imported in the country. Close to 50% of all KEMSA associated costs goes to distribution of the products with warehousing and administration being the other two high cost centres.
Okiror, (2009) reveals that in Uganda 32-50 per cent of medicines essential for treatment of common diseases such as Malaria, Pneumonia Diarrhea, HIV/AIDS, Tuberculosis Diabetes and Hypertension are not available. As many African countries, Uganda is struggling to develop adequate health care systems. One critical problem is establishing effective supply chain systems for drugs and medicine equipment to ensure availability at local treatment facilities. Sixty five percent of facilities across Uganda experienced medical supply stock outages (Stock out) in 2008 (Mott 2009). Overtime, many stop-gap actions have been implemented but problems persist. Adequate access to functioning healthcare systems is particularly difficult in rural districts. Lack of a consistent drug supply is identified as a primary reason way health centres are not utilized with resulting high morbidity and mortality rates from malaria, diarrhea HIV/AIDS.

While developing countries have problems of medicine stock-outs in the public health facilities, in some industrialized countries medicines are made available at the public health institutions but at the disregard cost control principle. For example in Switzerland the health care market is still marked by monolithic structures and inertia attributable to high level of regulation which can hinder or prevent innovation hence the high proportion of government investment and the associated low pressure in respect of effectiveness and efficiency. (Motter and Rohner, 2008).

But globally cost control consciousness is growing and procurement activities of hospital pharmacies are not left behind. The adoption of e-procurement saves the costs of the preparation and transmission of paper purchase requests and invoices and enables ordering systems to be tied directly to production systems thus eliminating costly, time–consuming errors from manual data entry (Brynjolfsson and Yang,
The study also notes that in Germany 38% of the German hospitals already implement an electronic purchasing order and 35% an electronic invoice. For Switzerland no such evidence exists so far but the adoption rate should be more or less the same level. Approximately 35 to 40 percent of hospitals supply related costs are devoted to handling and processing materials and purchasing orders as compared to the aviation industry which is less than 10% (Grossman, 2000).

2.4 Stock Levels

Since public and mission health supply chains are not driven by profit motivation, decisions of what medicines and medical supplies to stock are to a large extent guided by the essential drugs concept. However, the manager needs to know the optimal order quantity that should be ordered at any time without subjecting the organization to overstock, under stock or unnecessary cost. This is referred to as economic order quantity (EOQ). Economic order quantity is the level of inventory that minimizes the total inventory holding costs and ordering costs. Striking a balance between the two costs is the challenge for the supply chain manager. This becomes more challenging in health supply chains since under stock can result in loss of life while overstock could lead to expiries and/or obsolescence.

2.5 Supply Chain Management Practices

Supply chain is linked set of resources and processes that begins with the sourcing of raw materials and extends through the delivery of end items to the final customers. While the separation of supply chain activities among different companies enables specialization and economies of scales there are many important issues and problems...
that need to be resolved for successful supply chain operations- this is the main purpose of SCM (Cox, 2004)

According to Davies (2008), effective supply chain management is all about delivering the right product in the right quantity and in the right condition with the right documentation to the right place at the right time at the right price.

Daveshwas and Rathee (2008) state that the driver behind supply chain management is to remove inefficiencies, excess costs and excess inventories which extends from the customer back through his suppliers and through his suppliers’ Suppliers’ and so on back.

By having the program driven by the customer, it is hoped that excess inventories kept inorder to take care of uncertainties and slow response will be significantly eliminated. The success of supply chain management rests with logistics with functional areas including: Network Design, Information Technology , Transportation, Inventory and Storage, Warehousing, Material handling, Loading and Unloading and Packaging and Re-packaging. According to Diederichsand and Leopoldseder (2008) poor infrastructure, lack of skills and complex regulations mean that logistic costs in developing markets are significantly higher than those in the US and EU. As a fraction of total product cost, for example, logistics costs in China are around three times those of the E.U. A poor understanding of Logistics costs can destroy much of the cost advantage achieved by shifting production to low cost-markets.

Many firms are reducing their supply base so that they can more effectively manage relationships with strategic suppliers Tully (1995). Mason (1996) and Capacino
(1996) indicates that buying firms are developing cooperative; mutually beneficial relationships with suppliers and viewing suppliers as virtual extensions of their firm.

Mary, et al (2005) part of supply chain risk management involve periodical assessment and redesign in response to market changes, including new product launches, global sourcing, new acquisitions, credit availability, the need to protect intellectual property and the ability to maintain asset and shipment security. In addition supply chain risks must be identified and quantified. SCC members report that less than half of their organizations have metrics and procedures for assessing, controlling and mitigating such risks.

2.6. Challenges in Health Care Systems

Public sector health care supply chains are facing major challenges. On one hand, the need and the resources for improving public health in developing countries have never been greater. Ministries of public health and international development partners continue to work on basic programs started generations ago, including primary health care, Expanded Programme on Immunization (EPI), and family planning. Meanwhile, major initiatives for newly prioritized health problems, including HIV and AIDS, tuberculosis (TB), and malaria have evolved. Global funds now provide financing for all three of these new initiatives, and they provide country and international stakeholders with new options for obtaining drugs, expendable supplies, and equipment (Aronovich, Marie, Ethan, Adriano and Linda, 2010). Health sector reform programs, underwritten by the donor community, are being implemented with the goal of improving both health services and their supporting management systems. Bilateral assistance programs continue to provide financing, commodities, and
technical assistance to developing countries with the same goals stated above. Many positive developments have come from these various efforts (O’Brien, 2003).

On the other hand, public health facilities continue to experience frequent stockouts of essential medicines and other necessary products used to provide health care. The weakness of health systems to deliver services required by patients at the right time and place is common to most developing countries.

Among the major challenges facing the public health system is underutilized. Stockouts and expired drugs occur at all levels in the public systems including distribution outlets, district stores, and hospitals MoH, (2009b) particularly in the public system in rural communities (Elliot, 2008). The causes, as suggested by previous studies and during recent interviews with stakeholders are related to lack of funding MoH,(2009c) and limited control of drug quality and pricing Elliot, (2008) such as counterfeiting Wendo, (2008), mark ups Elliot,(2008): expired drugs Tebajjukira,(2009) and lack of transparency and regulation concerning price MoH, (2009b; Kiapi, (2008;). Problems also constitute leakages including commissions and pilferage Kaheru, (2009) and lack of coordination with the private sector inn procurement MoH, (2009c); forecasting Izama, (2009), problems of unsolicited drug donations, parallel production and lack of overview of available stocks MOH, (2008b). While some of the above are closely linked with logistic problems, specific challenges with the drug supply chain are pointed out including: Lack of efficient funding and ordering processes means it can take six months to complete tendering process, lack of competent staff (MOH, 2009b; Kimera, 2008; All Africa, 2009; Okuonzi, 2009) and poor coordination between store manager and medical clinicians.
Today, health supply chains at the country level face a range of challenges, among them limited geographic reach, lack of information for reliable forecasting and supply chain planning, insufficient scale in warehousing and distribution, and poor access to debt and equity financing. On the whole, they are characterized by antiquated systems that lack the capacity to deliver the increasing volume and complexity of drugs now supported by donor funds, which could reach $10 billion a year by 2011.

According to O’Brien, (2003), achieving good health outcomes requires supply chains that provide consistent availability of affordable, high-quality products in a location that is geographically accessible to the target population. Furthermore, supply chains must be adaptable and cost-effective, and have financial integrity to sustain good outcomes. The four aspects of supply chain performance are geographic access, availability, affordability, and quality. According to Anderson, Britt, and Favre (1997), supply chain management addresses the following problems: first, distribution Network Configuration including number, location and network missions of suppliers, production facilities, distribution centers, warehouses, cross-docks and customers. Second, Distribution Strategy: questions of operating control (centralized, decentralized or shared); delivery scheme and transportation third, Trade-Offs in Logistical Activities: The above activities must be well coordinated in order to achieve the lowest total logistics cost. Trade-offs may increase the total cost if only one of the activities is optimized. Forth, Information: Integration of processes through the supply chain to share valuable information, including demand signals, forecasts, inventory, transportation, potential collaboration, Inventory Management: Quantity and location of inventory, including raw materials, work-in-process (WIP) and
finished goods lastly, Cash-Flow: Arranging the payment terms and methodologies for exchanging funds across entities within the supply chain.
CHAPTER THREE : RESEARCH METHODOLOGY

3.0 Introduction

This chapter described the definition of research design, type of research design, justification for the choice of research design, the identification of the population and target population, sampling frame, sampling technique, research instrument, data collection procedure and data processing and analysis.

3.1 Research Design

Ghauri and Gronhang (2006), defines research method as a systematic, focused and orderly collection of data for the purpose of obtaining information from them to solve/answer a particular research problem or question. The research design used in this study was descriptive survey involving use of questionnaire. According to Koul (1992) descriptive survey is the only means through which views, opinions, attitudes, and suggestions for improvement of practices can be collected.

3.2 Population

This was a census survey and hence all the 15 health institutions in Bungoma East Sub-county were considered. The researcher conducted 15 site visits and interviewed the in-charges of the drugs supply chain management. This mean one respondent per institution.
3.3 Data Collection

The instrument used to collect the primary data was a structured questionnaire set in a likert scale format. The questionnaire was divided into two parts. Part A was used to gather general information about the respondents. Part B was used to gather information that will enable conclude on the research.

The researcher administered the questionnaires using face to face guided interviews and self-administered questionnaires. These methods enabled the respondent to read and understand the questions before answering them. This raised the success of the number of questionnaires filled and returned.

3.4 Data Analysis

The data was edited for completeness and consistency. Descriptive statistics was used to analyse the data. The data was presented in frequency tablets, analyzed through frequency counts, percentages and cumulative percentages. The computed percentages were used to determine the respondents’ perception of the influence of SCM practices on stock levels of essentials drugs. In orders to determine the extent to which the various SCM principles affect the stock levels, mean scores of weights of the respondents’ opinions were worked out. Similarly mean scores of the weights of the respondents’ opinions on challenges facing the supply of essential drugs were worked out.
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section gives an analysis of data collected from the 15 public Health Institutions in Bungoma East Sub-County.

The analysis was done on the demographic characteristics of the respondents and the contextual factors of the study. The synthesized data are described and presented in tables.

4.2 Demographic Characteristics of Respondents

A total of 15 staff (the in-charges) from respective 15 public health institutions in Bungoma East Sub-county were interviewed on various aspects of supply chain management practices with respect to stock levels of essential drugs. (Appendix 2). Dispensaries formed the bulk (74%) of the health institution (Table 1). Health centres and hospitals accounted for rest at equal percentages. The respondents stated that their major duties included: ordering of drugs, administration, nursing, diagnosis, prescription, maternal and child care. The duration which they had worked in their respective departments range from 2 to 32 years. Most of them (60%) had a work experience of less than 10 years. Those that had worked for either 11-30 years or over 30 years accounted for 20% each (Table 2).
4.2.1 The Categories of the Public Health Institution

There are 15 Public Health facilities in Bungoma East sub-county. They are in the categories of hospital, Health Centre and Dispensaries. The proportions are indicated as below:

Table 1: Frequency distribution of types of Public Health facilities in Bungoma East Sub-County

<table>
<thead>
<tr>
<th>Type of health facility</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>2</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Health Centers</td>
<td>2</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Dispensaries</td>
<td>11</td>
<td>74</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Ministry of Health Bungoma East Sub-County (2013)*

Table 1 shows that 13% of the Health Institutions are of the Hospital Category, another 13% of Health centre category and 74% of Dispensaries category. The dispensaries form the bulk of the health institutions at 74%, This conforms to the Government policy that assigns the dispensaries as the lowest level of health care supposed to be easily reached by the population hence widely dispersed with the sub-county. Health centres and District hospitals are the higher referral points for the widely dispersed dispensaries.
4.2.2 Work Experience Duration of The Respondents

The duration of work experience was determined by asking the respondents to state how long they have worked in the public health sector.

Table 2: Frequency table showing work experience of respondents

<table>
<thead>
<tr>
<th>Work experience in years</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cummulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10 years</td>
<td>9</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>11 - 30 years</td>
<td>3</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>&gt; 30 years</td>
<td>3</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Researcher (2013)

Out of the 15 responses it was observed that 60% had worked below 10 years, 20% between 11-30 years, and those who had worked over 30 years were 20%. Majority of the respondents had worked for less than 10 years. This is a normal distribution because nearly all Kenyan trained health workers start with the Ministry of Health and as years go by some do leave for private and non-governmental employment, and the natural attrition of retirement and even death come in.

4.3 Findings on Contextual Factors

The contextual factors in this study were based on supply chain management practices. The opinions of the respondents were sort on how the application of the practices affects the stock levels of essential drugs in the public health institution. The
SCM practices that were investigated included: 5 rights, cost management, supplier management, quality control, clear specialization, price negotiation. The questionnaire was set on a five point Likert scale format. They could either strongly agree=1, agree=2, agree in part =3 disagree =4 or strongly disagree = 5

### 4.3.1 Five Rights Management Principle

In five rights principle, the buyer ensures that the materials or goods bought are of the right quality, the right quantity, are delivered to the right place at the right time for the right price.

The respondents were asked to state on a five point Likert scale whether KEMSA services and local supplier services were satisfactory to the facility. The results were as shown below

**Table 3: Frequency table of responses on the effect of 5 rights Principle on stock levels of essential drugs**

<table>
<thead>
<tr>
<th>Opinion of respondents on the impact of 5 rights on stock levels of essential drugs</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>9</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Agree</td>
<td>5</td>
<td>33</td>
<td>93</td>
</tr>
<tr>
<td>Agree in part</td>
<td>1</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 3 shows that 60% of the respondents strongly agreed that the 5 rights principle has an impact on the stock levels of essential drugs in their facilities, 33% agreed and 7% agreed in part. Nobody disagreed or strongly disagreed. Since the cumulative percentage of those who agreed is 100% and nobody disagreed implies that the 5 rights principle is an important purchasing tool in ensuring acceptable stock levels of essential drugs.

### 4.3.2 Cost Management Principle

By cost management we mean the purchasing officer’s efficiency and effectiveness so as to contribute to the organizations cost saving and hence bottom line profit. This he achieves by considering total cost of ownership among others. The respondents were asked to state on a five point Likert scale whether KEMSA drugs are cost effective as compared to local purchase. The results were as shown below

**Table 4: Frequency table of responses on the effect of cost management on stock levels of essential drugs**

<table>
<thead>
<tr>
<th>Opinion of respondents on the effect of cost management on stock levels of essential drugs</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>9</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Agree in part</td>
<td>2</td>
<td>13</td>
<td>93</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Researcher (2013)*
Table 4 shows that 60% strongly agreed, 20% agreed, 13% agreed in part and 7% disagreed no one strongly agreed. The cumulative score of agreement points is 80%. This means to a great extent, the general opinion is that procuring from KEMSA is more cost effective. KEMSA has a special service section that can sell medicine to the Government health institutions apart from the normal free supply schedule. In situations where the normal KEMSA supply has delayed which is quite common at the district hospital level. The essential drugs purchasing officer should give KEMSA a preference to the local suppliers.

4.3.3 Supplier Management Principle

Supply management principle means building a cordial working relationship between the purchasing organization and the supplier managing proactively by anticipating future needs and amicably resolving disputes that arise during the contract (CIPS) on a fire Likert scale, the respondents were asked whether good working relations results in timely delivery of goods. The results are as shown below

Table 5: Frequency table of Opinion of respondents on the effect of supplier management on stock levels of essential drugs

<table>
<thead>
<tr>
<th>Opinion of respondents on the effect of supplier management on stock levels of essential drugs</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>6</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>Agree in part</td>
<td>3</td>
<td>20</td>
<td>86</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>13</td>
<td>99</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Researcher (2013)
Table 5 shows that 40% strongly agreed, 26% Agreed, 20% Agreed in part, 20% disagreed and 1% Strongly disagreed. Cumulatively 66% has the opinion that supplier management has an impact on stock levels of the essential drugs. This implies that it is important that the public health institutions drugs supply chain managers develop good working relations with the supplier since this has a positive impact on the acceptable stock levels of essential drugs.

4.3.4 Quality Control

For the purchase, this starts with selecting the right supplier after a due supplier analysis process and subsequent continuous contract performance evaluation. The respondents were asked to state on a five point Likert scale whether inspection and acceptance committee contributes to quality assurance. The results were summarized as shown below

Table 6: Frequency of respondents' on the effect of quality control on stock levels of essential drugs

<table>
<thead>
<tr>
<th>Opinion of respondents on the effect of quality control on stock levels of essential drugs</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>2</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>Agree in part</td>
<td>6</td>
<td>40</td>
<td>74</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>13</td>
<td>87</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Researcher (2013)
Table 6 indicates that only 13% of the respondents strongly agreed that quality control has an impact on stock levels of essential drugs. 21% agreed, 40% agreed in part, 13% disagreed and another 13% strongly disagreed. This means that quality control does not have a strong impact on the stock levels of essential drugs in Bungoma East Sub-county. Part of the explanation for this is that 74% of the health institutions interviewed belong to the dispensary category. Dispensaries get their drug supplies 100% from KEMSA. They have no mandate to make complimentary local purchase like the district hospital. It is such, most dispensaries don’t have functional inspection and acceptance committee since KEMSA supplies are for free and are to be accepted in whole every time.

4.3.5 Specification Principle

Clear specification while placing a purchase order serves two purposes; to communicate the buyers need and to establish the criteria by which to judge what is eventually delivered. To assess the effect of this principle on stock levels of essential drugs, the respondents were asked to state on five point Likert scale whether clear specification leads to right drugs acquisition. The results were shown below
Table 7: Opinion of respondents on the effect of clear specification on stock levels of essential drugs

<table>
<thead>
<tr>
<th>Opinion of respondents on the effect of clear specification on stock levels of essential drugs</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>4</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Agree</td>
<td>6</td>
<td>40</td>
<td>66</td>
</tr>
<tr>
<td>Agree in part</td>
<td>3</td>
<td>20</td>
<td>86</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>7</td>
<td>93</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Researcher (2013)

The above (table 7) shows that 26% strongly agreed, 40% agreed in part, those who disagreed and strongly disagreed were 7% each. Cumulatively 66% agreed fully that specification has an impact on stock level of essential drugs. This implies that the purchaser must always give clear specification of their requirements whenever they place a purchase order. This leads to less rejection of delivered drugs and hence contribute to maintenance of an optimal stock level of essential drugs.

4.3.6 Price Negotiation

A professional purchase officer goes into price negotiation having undertaken a purchase research on demand analysis, vendor analysis and supply market analysis. This enables him to have an informed argument with the seller. But government institutions purchasing officers are restricted by the Procurement and disposal Act 2005 (PPD) to apply only open competitive tendering procedure and not a restricted
negotiation with a few suppliers. The respondents were asked to state on a five point Likert whether the tendering requirement by PPD is helpful in attaining good price for essential drugs. The results were as shown below

Table 8: Frequency table of respondents' opinion on the effect of price negotiation on stock levels of essential drugs

<table>
<thead>
<tr>
<th>Opinion of respondents on the effect of price negotiation on stock levels of essential drugs</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>1</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Agree in part</td>
<td>3</td>
<td>21</td>
<td>41</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>26</td>
<td>67</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>5</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Researcher (2013)*

Table 8 shows that only 7% strongly agreed. 13% agreed, 21% agreed in part, 26% disagreed and 33% strongly disagreed. Cumulatively only a minority of 20% agreed that the procurement and disposal ACT 20005 in attaining good price and hence optimal stock levels of essential drugs. Majority (80%) disagreed in one way or another. The reason for this could be because open competitive tendering only considers the lowest price but not other factors like quality and service level of supplier. In the end some tenders get awarded to incompetence bidder, poor performance and hence poor stock levels of essential drugs.
4.3.7 Weights of Respondents’ Opinion on the SCM Practices

The strengths of the influence of the SCM principles on the stock levels of essential drugs as scored by the respondents were worked out. The results are shown on table 9 below as mean weights of the opinions. Mean score 1 indicates the strongest positive opinion on the assessed SCM principle on the stock levels. Scores away from 1 upwards indicate weakness of the SCM principle.

Table 9: Opinion of the respondents on the effect of SCM practices on stock levels of essential drugs in Bungoma East Sub-county health institutions

<table>
<thead>
<tr>
<th>Supply chain management practices</th>
<th>FREQUENCIES (F)</th>
<th>WEIGHTS (W)</th>
<th>(\Sigma W_f)</th>
<th>(\Sigma f)</th>
<th>Mean = (\frac{\Sigma W_f}{\Sigma f})</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEMSA service is satisfactory (5 rights)</td>
<td>9 5 1 0 0</td>
<td>22 15</td>
<td>1.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local suppliers services are satisfactory (5 rights)</td>
<td>9 5 1 0 0</td>
<td>22 15</td>
<td>1.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEMSA drugs are more cost effective (cost management)</td>
<td>9 3 2 1 0</td>
<td>25 15</td>
<td>1.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good working relations results timely delivery of goods (supplier management)</td>
<td>6 4 3 2 1</td>
<td>36 16</td>
<td>2.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection and acceptance committee contributes to quality control (quality control)</td>
<td>2 3 6 2 2</td>
<td>44 15</td>
<td>2.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear specification leads to right drugs acquisition (specification)</td>
<td>4 6 3 1 1</td>
<td>34 15</td>
<td>2.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tendering requirement by PPD act and regulation is helpful in attaining good price (price negotiation)</td>
<td>1 2 3 4 5</td>
<td>55 15</td>
<td>3.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to the results on table 9 above, 5 rights SCM principle scored the highest at 1.47, followed by cost management at 1.67, supplier management 2.25, specification 2.27, quality control 2.93, and price negotiation using PPD Act 2005 and regulation scored poorest at 3.67. This means that 5 rights and cost management principles have the strongest influence on stock levels of essential drugs. They are followed by supplier management principle and the specification. Price negotiation by applying the tendering process as required by PPD Act 2005 is the least influential in stock levels of essential drugs.

4.3.8 Challenges Facing Supply Of Essential Drugs

The challenges facing the supply of essential drugs in Bungoma East Sub-county were also assessed. The strength of the respondents opinions were worked out and the results were as shown below on table 10.
Table 10: Likert scale scoring of challenges that face the supply of essential drugs in Bungoma East sub-county

<table>
<thead>
<tr>
<th>Supply chain management challenges</th>
<th>WEIGTHS (W)</th>
<th>FREQUENCIES (F)</th>
<th>Mean (WF/Σf)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Most challenging</td>
<td>Challenging</td>
<td>Least challenging</td>
</tr>
<tr>
<td>Poor quality of drugs supplied</td>
<td>0</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Inadequate information flows to and from suppliers</td>
<td>0</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Lack of cooperation from supply chain members</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Poor management of supply chain inventories</td>
<td>0</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Market price fluctuation</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Inadequate funding to the facility</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Pilferage at the end user level</td>
<td>1</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Researcher (2013)

ΣWf = summation of Weights*Frequency of respondents

Σf = total number of respondents

Mean \( \bar{X} = \frac{\Sigma Wf}{\Sigma f} \)

Table 10 shows how the interviewed staff rated the different challenges facing the supply of essential drugs. A score of 1 represented most challenging. The challenge reduced with increasing score. Most of the respondents rated market price fluctuation as the most challenging variables (Mean score 2.07) This was followed by inadequate funding (2.40) and poor quality of supplied drugs (2.47). inadequate information
flows to and from suppliers, lack of cooperation from supply chain members, poor management of supply chain inventories and pilferage at the end user level were rated as the least challenging.

4.4 DISCUSSION

The present study revealed dominance of dispensaries followed by health centres and the sub-county hospitals. This is typical of Kenya’s health care system which is structured in a step-wise manner so that complicated cases are referred to a higher level. These can be attributed to the fact that the government usually employs newly qualified health personnel every year.

The arrays of duties of interviewed staff notwithstanding, all of them were involved in one way or another in the supply essential drugs in the health institutions. They therefore provided a vital sample with which to evaluate the effect of supply chain management practices on stock levels of essential drugs in the surveyed public health facilities. Results show the perceptions of the respondents on the performance of 5 rights, cost, supplier, quality control, clear specification and price negotiation management.

The study revealed that the 5 rights principles the strongest impact on stock levels. The 5 rights- The buyer ensures that materials or goods are of the right quality, the right quantity are delivered to the right place at the right time for the right price; Cost Management- that purchasing efficiency and effectiveness contribute to organization’s cost saving and hence bottom line profit. This is achieved by considering total cost of ownership and by putting in place efficient and effective delivery system and inventory management (David, et al, 1997).
On aspect of cost management, respondents seemed to agree with the assertion that KEMSA drugs are cost effective. KEMSA supplies all public facilities in the country with medicine, non-pharmaceutical supply, and medical equipment free of charge. However close to 50% of all KEMSA associated costs goes to distribution of the products with warehousing and administration being the other two high cost centres. Consequently these high costs will render drugs supplied by KEMSA less cost effective. Since KEMSA enjoys monopoly, lack of competitions negates the need to streamline operation to run efficiently.

With regard to supplier management, there is clear need for the supply chain managers to have a good cordial working relations with KEMSA and local suppliers. This is supported by the overwhelming agreement that good working relations results timely delivery of goods. Inspection and acceptance committee contributes to quality control and clear specification leads to right drugs acquisition.

Evidently, the respondents rated poorly the price negotiations offered by the stated actors. Most apprehension was apportioned to tendering requirement by public procurement and disposal Act 2005 and regulation 2006. The respondents felt that the said law was not helpful in attaining good price and consequently could affect stock levels. As currently practiced public procurement is not effective hence the need to evolve, for example to e-procurement which saves the costs of the preparation and transmission of paper purchase requests and invoices and enables ordering systems to be tied directly to production systems thus eliminating costly, time – consuming errors from manual data entry (Brynjolfsson and Yang, 1996).
In instances where the health institutions are forced to purchase the drugs locally other than the KEMSA supply, market price fluctuations was identified as the most challenging factor that could affect stock levels of essential drugs in health facilities in Bungoma East sub-county. Prices in both public and private sectors are key indicators of access to treatment. According to O’Brien, K. (2003), market price fluctuation hampers consistent availability of affordable, high-quality products. Ultimately this lead to unpredictable stock levels of essential drugs.

Inadequate funding to the facility, poor quality of drugs supplied, poor management of supply chain inventories and pilferage at the end user level also identified as challenges to some extent. Many authors in other studies have identified similar challenges in the supply of essential drugs. Such challenges include lack of funding, limited control of drug quality and pricing, counterfeiting, expired drugs and lack of transparency and regulation concerning price (MoH, 2009c; Elliot, 2008; Wendo, 2008 and Kiapi, 2008).
CHAPTER FIVE: SUMMARY. CONCLUSION AND RECOMMENDATION

5.1 Summary

The objective of the study was to determine the effect of supply chain management practices on the stock levels of essential drugs in public health institutions in Bungoma East Sub County.

In terms of five rights consideration, the majority of the respondents strongly agreed that five rights had an impact on stock levels. This infers that the supply chain managers consider the drugs right quality, quantity, right delivery time and place and at the right price, whenever they consider replenishing stock levels.

On cost management practice, the respondents seemed to agree that KEMSA drugs are cost effective. With regard to supplier’s management practice, the majority of the respondents were of the opinion that this should be upheld as it has an impact on stock levels of essential drugs. Clear specification and a functional institution’s acceptance committee contribute to the availability of good quality stock of drugs in the institutions. But most respondents rated poorly the impact of the mandatory competitive tendering requirements by PPD and regulation on attaining fair price for drugs brought through local procurement procedure. Market price fluctuations when it comes to local buying was identified as the major challenge. This was followed by inadequate funding and poor quality of supplied drugs.
5.2 Conclusion

The contextual factors were shown to have a strong influence on the stock levels of essential drugs in the public health institutions of Bungoma East Sub-county. The supply chain management practices that were considered in this study were the 5 rights principle, supplier management principle, quality control, and specification and price negotiations. All the principles, apart from price negotiation if applied diligently by the in-charges of essential drugs supply chain, the optimal stock levels can be continuously maintained in the public health institutions.

When it comes to local buying of the drugs other than the KEMSA supply, market price fluctuation was identified as the most challenging. Inadequate funding was also identified as a challenge in this respect.

5.3 Recommendations

Findings from this study indicates that the respondents generally agreed that supply chain management practices studied can contribute to the attainment of acceptable stock levels of essential drugs apart from the currently practiced public procurement regulation in sourcing locally. Therefore there is a need for the public health facilities pharmacists and other in-charges of drugs purchase to be aware and apply the principles in their daily practice.

There is need for the government to review the public procurement Act 2005 because in most cases it does not end in fair price when it comes to buying locally. The local suppliers tend to collude when it comes to giving the bid price.
There is need to evolve e-procurement to change the cost of preparation and transmission of paper purchase requests and invoices and thus eliminating costly, time consuming errors from manual data entry.

5.4 Limitations of the Study

The results of this research may not be generalized to apply to all public health facilities in Kenya, except for those in the same categories of district hospitals and downwards. The higher levels of public health care, provincial and the two referral hospitals are more sophisticated in terms of capacity and equipments than the studied public health institutions in Bungoma East sub-county.

5.5 Suggestions for further study

The current research was based on census survey of all the public health institutions within Bungoma East Sub-County. A future study should be undertaken through a case study. Case study helps in finding in-depth investigation of single group, or event. Since the census survey considered three categories of health provision; hospitals, health centres and dispensaries, a case study of one institution can go into depth of challenges unique to the various categories. This can compliment the finding of this census survey.

Another study should also research on KEMSA’s buying practices. Since KEMSA enjoys some kind of monopoly there could be some kind of complacency in its activities hence not cost effective in its undertakings. Cost saving by KEMSA would translate to cheaper drugs cost cascading down to better stock levels of essential drugs at the public health institutions.
REFERENCES

Asante, F., and Aikins, M.(2008). Does the NHIS cover the poor? Institute of Statistical Social and Economic Research and School of Public Health at the University of Ghana, with support from the Danida Health Sector Support Office


http://www.industryweek.com/ReadArticle.aspx?ArticleID=2279

(accessed July 23, 2013)


APPENDICES

Appendix I: Introduction Letter

RE: A Study determine the effect of supply chain management practices on the stock levels of essential drugs in public Health Institutions in Bungoma East sub-county.

Thank you for agreeing to fill this questionnaire. The study is being conducted by a student of university of Nairobi SIMON MUNGU) to gather information about the effect of supply chain management practices on the stock levels of essential drugs in public Health Institutions in Bungoma East sub-county.

The questionnaire should take 2-6 minutes of your time. Your participation is voluntarily and information given will be treated with utmost confidence for academic research only. Anonymity and confidentiality will be assured.

Thank you for taking your time to share the insight with me.

Yours faithfully,

Simon Mungu (D61/60624/2011)
Appendix II. Questionnaire

1. Name and title of the respondent

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

2. Name of work section/department

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

3. For how long have you worked in the public health sector

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

4. Briefly explain your major duties

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

5. Kindly indicate whether you agree or disagree with the following statements on the supply chain management practices that are currently being practiced in Bungoma East sub county Public Health Institutions

1- Strongly agree, 2- Agree, 3- Agree in part, 4-Disagree and 5. Strongly disagree.

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<tr>
<th>Statement</th>
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<tbody>
<tr>
<td>KEMSA service is satisfactory to the facility</td>
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<td>Local suppliers services are satisfactory to the facility</td>
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<td>Buying drugs from KEMSA is more cost effective</td>
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<td>Having a good working relations with suppliers results in timely delivery of goods</td>
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<td>Presence of drugs inspection and acceptance committee contributes to quality control of goods supplied</td>
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<td>Clear specification leads to the right drugs acquisition</td>
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<td>The tendering requirement by public procurement and disposal act and regulation 2006 is helpful in attaining good price from local suppliers.</td>
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46
6. The following is a list of some of the supply chain managing challenges that face the supply of essential drugs in Bungoma East sub-county. Kindly indicate by tick whether they are challenging or not challenging. The ranking means


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<tbody>
<tr>
<td>1</td>
<td>Poor quality of drugs supplied</td>
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<td>2</td>
<td>Inadequate information flows to and from suppliers</td>
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<td>3</td>
<td>Lack of cooperation from supply chain members</td>
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<td>4</td>
<td>Poor management of supply chain inventories (Stock)</td>
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<tr>
<td>5</td>
<td>Market price fluctuation</td>
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<td>6</td>
<td>Inadequate funding to the facility</td>
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<td>7</td>
<td>Pilferage at the end user level</td>
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</table>

Simon Mungu

Researcher
Appendix III : List of the Public Health Institutions in Bungoma East Sub-county, Kenya

1 District Hospital - Webuye- Staff population about 350(including 7 Doctors, 5 Pharmacists and 20 Clinical officers)

1 Sub-District Hospital- Staff population about 50 (including one pharmaceutical Technologist)

2 Health Centres- Staff population about 30
   • Webuye
   • Milo

11 Dispensaries- about 5 staff at each of the dispensaries
   • Miedo
   • Matulu
   • Sinoko
   • Khalala
   • Lukusi
   • Kayaya
   • Mahanga
   • Lurale
   • Mukhe
   • Mihu
   • Khahoya

Source: Ministry of Health – Bungoma East District (2012)