

**LOGISTICAL DRIVERS OF EMERGENCY SUPPLIES AND SERVICE
DELIVERY BY HOSPITALS IN NAIROBI, KENYA**

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DECLARATION

This research proposal is my original work and has not been submitted for examination in any other university or institution of higher learning.

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ABBREVIATIONS AND ACRONYMS

COMESA	Common Market for Eastern and Southern Africa
EDs	Emergency Departments
KEMSA	Kenya Medical Supplies Authority
KIPPRA	Kenya Institute for Public Policy Research and Analysis
RBV	Resource Based View
RD	Resource Dependency Theory
TCE	Transaction Cost Economic
WHO	World Health Organization

ABSTACT

Emergency supplies are important and it is essential to make sure that they are not only readily accessible but also used rationally. This study sought to firstly, identify the logistical drivers of emergency supplies and secondly, to establish the relationship between the logistical drivers and the service delivery by hospitals in Nairobi, Kenya. A descriptive survey design was used to carry out the study. The study adopted primary data which was collected using open and closed ended questionnaires. The target population was two hundred and twenty-two (222) which comprised of 150 pharmaceutical firms and 72 hospitals. Since the population was large, sampling was done and the sample size was 142 firms which comprised of 96 pharmaceutical firms and 46 hospitals. On the first objective, the findings established that the logistical drivers which are used fully by the hospitals were transportation, facility, storage, information system, inventory management, procurement and packaging. On the second objective, the findings indicate that transportation, facility, storage, inventory management, procurement and packaging all had a positive and significant relationship with service delivery of hospitals in Nairobi. Information system, material handling and forecasting were found to have a positive but insignificant relationship with service delivery of hospitals in Nairobi. It can be concluded transportation, facility, storage, inventory management, procurement and packaging positively and significantly influence delivery's, responsiveness, reliability, flexibility, privacy, tangibility, lead-time and fulfilment rate, compensation and contract. From the findings, the study recommends that transportation, facility, storage, inventory management, procurement and packaging should be adopted as strategies by hospitals if they are to meet efficient service delivery. The limitation of study is that it only focused on hospitals and pharmaceuticals in Nairobi, Kenya and thus the results cannot be conclusive to other hospitals and pharmaceuticals firms outside Nairobi. The study suggests that other logistical drivers which were not covered in this study should be investigated to establish the extent to which they relate with service delivery.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Logistical drivers act as a major function in any economy that facilitates the flow and movement of various economic transactions. They are key functions that facilitate the sale of basically all services and goods. To classify the logistical drivers, one need to consider that if supplies delay then, the customers may fail to purchase them. The economic activities in the entire chain suffer if the logistical drivers fail to complete this function. Application of logistical organization concept tends to reduce the total logistics costs (Ailawadi & Singh, 2005). Logistical functions logically comprise of the structure of cost-effective dealings, influencing the urge for movement of items, their quantities and destinations, reliability and transportation of produce from the location of the store, management of logistical driver and movement, management of operations, the structure and guidelines of the product inventories, deployment and the management of storeroom facilities, development, carry out functions directly trailing and preceding to carriage of goods (Baltzan & Philips, 2010)

Saving patients in cases of an emergency is an essential service across the globe (Reuter-Oppermann, Van den Berg, & Vile, 2017) ‘Access to quality health is a basic right guaranteed by 2010 constitution of Kenya.’(KIPPRA 2018 Report by:-Mugo, Onsomu, Munga, Nafula, Mbithi and Owino) .Accessibility of emergency medicines is vital and is dependent on the geographical reach, efficacy, affordability, appropriateness, safety, quality and availability to the patient and sickness being treated (Atridge &Preker, 2005).

Patients who require urgent medical attention at times fail to get emergency supplies due challenges of the logistical drivers the different steps in the course of emergency supplies from the source. It is therefore necessary to ensure that they are not only readily available, but also that they used rationally. According to World Health Organization (2004), a scientific and technological revolution is being witnessed in the pharmaceutical firm that will enable emergency supplies manufacturers make profitable original supplies for those conditions that looks impossible to treat quite appropriately at the moment in

addition to ailments that previously resisted all treatment. This calls for adjustments that require the supply chain to adjust with it. Service delivery to higher volume and variety of new products moving into clinical development, the industry's pipeline will expand more and hence become complex, because of demands placed in manufacturing and distribution. Despite its enormous participation in the global market, pharmaceutical firm's supplies shall be utilized in a nation, when a particular incident seems essential. This is done, in respect towards aspects such as safety, cost benefit ratio, quality, efficacy, sign for dealing with ailments viewed important within the nationwide framework, adequate knowledge of the supplies plus current pertinent aspects (WHO, 2015). Logistical drivers of emergency supplies ought to be the centre of an essential progress that seem to link all in the progression while focusing on the vision of interdependence (Goyet, 2010). Consequently, the synchronization of the three logistical drivers (facility, inventory and transportation) play important role in ensuring that the emergency supplies are easily accessible to the patients especially during an outbreak, accidents and certain weather conditions that may cause an urgent medical attention.

1.1.1 Logistical drivers

Currently logistical drivers are measured as the trend of profitable functions to administer the supplies flow in the part of manufacture and circulation, of interdisciplinary study areas associated with the exploration intended for current prospects to develop the effectiveness of the supplies flow. Logistical drivers are the most efficient, market-oriented mechanisms for the performance of economic returns which functions in the world of produce circulation structure, as a way of development, planning and formation of the material flows with financial costs and minimal time (Kobersy, Shkukin, & Bogoviz, 2014).

Logistical drivers comprise the supply chain from the manufacturers to the consumers. Logistical drivers are broken down into the operational components of the supply chain management, quantificational/forecasting, procurement, storage/warehousing, transport, inventory management, and information systems, and focus on specific tasks within a particular health system programme as posited by Prokhorova, Kolomyts, Nenasheva, Sholukha and Vashchenko (2016). Bozarth and Handfield (2006) identify the three major

logistical drivers as inventory and inventory management, facilities, and eventually transport. Kobersy et al. (2014) contends that logistical drivers ought to work as a component towards achieving the most ability to work and unite jointly. The main aspect of these drivers is the capability towards reacting promptly to different market situations and taking into account the different changes in environment situations. These environmental changes include breakdown of equipment, changes in road and tariffs, changes in demand and supply for services and goods, changes in rates on loans input, failure of various transport channels. Owing to these characteristics all the logistical drivers process characterizes a single coordination comprising of a flexible response to what is happening and a feedback.

1.1.2 Emergency supplies

Emergency supplies can be required by a patient who may not necessarily be in any kind of a disaster although, needs an urgent medical attention (Sorensen, Zane, Wante, Rao, Botolin & Rockenschaub, 2011). Emergency medicines are a part of emergency supplies that is concerned with the diagnosis and treatment of conditions resulting from trauma or unexpected ailment (WHO, 2015). Emergency supplies for example, medicine can be administered in various situations such as free standing Emergency Departments (EDs) hospital-based environments, observation medicine units, emergency medicine responses vehicles, urgent care clinics, disaster sites or via telemedicine. World health organization (2004) affirms its drafting of a list of emergency supplies which was developed through different forums and seminars with stakeholders in health profession. Supplies contained on the list, ought to be given to patients only when being treated in the hospitals. The supplies ought to be procured only from authorized suppliers' shops on the production of valid prescriptions.

1.1.3 Service Delivery

In the current scenario firms are categorized by a growing level of uncertainty. In the unsteady marketplace, companies face stiff aggressive situation because of the, technological changes globally, shorter products' life cycles, reduced margins, profitable scaled down markets, well and more informed customers with exceptional and rapidly

varying wants (White & Mohdzain, 2009). For firms to survive in the turbulent extremely demanding and competitive environment, they must continually improve their logistical drivers. Various firms are challenged to improve their level of service function by maintaining their cost-effectiveness. At strategic level, companies are more interested in the option of outsourcing to cope with competition. The pharmaceutical business in particular is regarded as very technical core role that include manufacturing and development. Logistical outsourcing for this kind of business permit firms to counter competition linked to the steady evolution of medicinal manufacturing and development (Elmokrini, Defaour, Mhendi & Berrado, 2016).

Firms no longer compete individually as independent entities, but rather as a central part of supply chain links. The important role to sustainable spirited benefit lies in distributing elevated excellent service resulting in satisfying consumers (Lambert & Cooper, 2000). E-SERVQUAL was developed ranging from quality delivery of service through two points, a three-stage process and empirical data collection using exploratory focus groups. The seven measurements are; reliability ,efficiency, fulfilment, contact, compensation, responsiveness, and privacy, which is centre of service degree and a recovery service degree (Zeithaml, Parasuraman & Malhotra, 2002).

1.1.4 Hospitals in Kenya

Developing countries like Kenya in many aspects, still lag behind especially in healthcare. Kenya's life expectancy is at 63years with infant and maternal mortality remaining pretty high. In 2002, Kenya spent a merger 5.1% of its gross domestic product (GDP) on health care this is noticeably lower compared to OECD (Organization for Economic Cooperation and Development) nations that spent an average of 9.8% similar for the period, besides these, Kenya's healthcare facilities are already experiencing steady development and growth, appropriate for well-known benchmark health care delivery while in the pharmaceutical industry Kenya, is still the biggest manufacturer of pharmaceutical produce in the Common Market for Eastern and Southern Africa (COMESA) area, which is about 50% of the marketplace and about 30 out 50 of the area are renowned pharmaceutical manufacturers based in Kenya (Kenya Pharmaceutical

Association of Kenya (2016). Management of pharmaceutical companies is directly connected to the country's capability to deal with healthcare. Practically, a periodic check of inventory policy is not applicable for hospital inventory administration since customer's order and patient's arrivals are unpredictable. Thus efficient administration of hospital inventory system needs a changed approach than periodic –review re-orders level (Uthayakumar & Priyan, 2013).

There more than 200 reliable hospitals in Kenya situated in various towns, thus comprising of Coastal, Central, Eastern, Nairobi, Nyanza, Western and Rift Valley regions. The hospitals comprise of both public and private hospitals in Kenya (Mugo, et al. 2004). The government of Kenya (GOK) approved the Kenya Healthcare Policy Framework (NHPPF) in 1994 as a blue print for managing and developing health care. It states the long- term strategic imperative and the agenda for healthcare sectors in Kenya. It divided the healthcare system in Kenya into three subsystem; the Commercial Private Sector, Faith Based Organizations' (FBO), and the Public Sector. Public sector is the largest when it comes to statistics in hospitals followed closely by the Commercial Private Sector and lastly by Faith Based Organizations. Pharmaceutical firms are also classified into three parts namely; the retailers, distributors and manufacturers Kenya Pharmaceutical Association of Kenya (2016). There is a big difference amongst those healthcares, particularly in the rural region.

The stability in Kenya and fairly well structured systems has made it easy to be the best in the East Africa region, consequently, The pharmaceutical industry in Kenya has also experienced tremendous expansion pace, and at the same time it provides perfect chances to manufacturers and exporters to set up their merchandise and services in the productive marketplace in East Africa this has necessitated, the need and necessity for improved accessibility, improvement of value care in health systems and sustainability. The healthcare sector forms a big part in the public domain and in which the Kenyan government is extremely reliant on the donor funding. In 1963, Kenya got independence and one of its primary proposal in the new government of Kenyan was 'Free Healthcare to All Kenyans' with the certainty that a healthy nation would make a better economic growth. In 1965 the Kenyan Government settled the 'Free Healthcare for All' policy to

all public hospitals. However, in 1973, a change development took place leading to the establishment of hospitals administration board to facilitate commercial private from ensuring the availability of funds and cost-sharing for hospitals in the neighbourhood. In the mid-1990s, more intensive restructuring of the health systems was implemented this was necessitated by the continuing financial constraints (Wanjau et al. 2012).

1.2 Research Problem

During emergencies, patients who require urgent medical attention at times fail to get them because the logistical drivers such as transportation facility, and inventory faced by pharmaceuticals firms. It is important to note the fact that the synchronization of the three logistical drivers namely facility, inventory and transportation plays a major role in ensuring that the emergency medicines are easily accessible to the patients during an outbreak, accidents and certain weather conditions that may cause an urgent medical attention (WHO, 2015). Balack and Beamon (2008) identify three most crucial characteristics of humanitarian logistics that are relevant to this study. These characteristics are: irregularity of demand in terms of volume and timing, unexpectedness of the occurrence of demand in large quantities with short lead times for a broad range of items, and high risks associated with the timeliness of deliveries.

Thiong'o (2014) undertook a study on the determinants of logistical functions outsourcing in pharmaceutical firms in Nairobi, Kenya. The study established that supplier's competence contributed mostly to logistics functions outsourcing followed by performance metrics which had the least effect on logistics function outsourcing. Mogaka (2015) studied on the practices of reverse logistics and influences on the returns of new products on performance of pharmaceutical companies in Nairobi County, Kenya. The research found that pharmaceutical firms in Nairobi have adopted reverse logistics practices, recycle landfill reverse and reuse. These local studies reveal several gaps in knowledge in the study area, and therefore this particular study is to address this gap. These studies did not address the logistical drivers and the service delivery component,

and therefore this study strives to fill that knowledge gap by including these variables in the research study.

Internationally, various studies have been conducted on humanitarian logistics. Kovács and Spens (2009) noted that despite most of the studies carried out on humanitarian logistics were on operations perspective, equally in the medical field a lot of research have been conducted on essential medicines and emergency preparedness however none has been undertaken specifically on logistical drivers of emergency medicines and service delivery of pharmaceutical. The study investigates emergency medicines logistical drivers and its effect on service delivery of pharmaceutical firms. It sought to address the following questions: what are the logistical drivers of emergency supplies in Nairobi hospitals and the relationship between logistical drivers in emergency supplies and service delivery by hospital in Nairobi, Kenya.

1.3 Objectives of the Study

The study will address the following objectives:

- i) To identify logistical drivers of emergency supplies by hospitals in Nairobi, Kenya.
- ii) To establish the relationship between logistical drivers of emergency supplies and the delivery services by hospitals in Nairobi, Kenya

1.4 Value of the Study

The research will assist in identifying the logistical drivers to prospective and existing researchers. This will increase their understanding within the sector as well discover sectors of additional research. In addition to this, the study will help researchers to determine the relationship between the logistical drivers and the delivery of services by hospitals in Nairobi, Kenya. The research will also help me as a researcher to identify the logistical drivers and the relationship between the logistical drivers and service delivery and more so try to be more proactive in my area of profession. The study is also important to pharmaceutical firms and hospitals in curbing the logistical challenges of service delivery during emergencies. Finally, the policy makers will obtain knowledge on logistical drivers and service delivery. While, from the responses obtained, they will be guided with appropriate design policies that will control this area of study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter identifies the research previously undertaken and the theories advanced in logistic drivers in emergency medicines relevant to the pharmaceutical industry. Therefore, the chapter will address pertinent issues in this area of study.

2.2 Theoretical Foundations

This section describes the theoretical foundations in which this study is based on, which include these theories; Resource Based View, Theory Resource-Dependence Theory, and Transaction Cost Economic Theory. Relationships of these mentioned theories to the study are expounded at the end of discussing each of these theories.

2.2.1 Resource-Dependence Theory

In 1978, Pfeffer and Salanik developed the Resource-Dependence Theory, which states that firms are affected and constrained by environments and based on this fact, firms act in order to control dependencies on resources by setting various forms of inter-organizational arrangements. This theory clearly depicts how the availability and the amount of resources firms have affect the behaviour of the firm. The sourcing of external resources is an important aspect for not only the strategic management but also the tactical management of any firm (Holden et al., 2015). The theory is essential as it explains the ways that firms strategize themselves and adopt several actions such as adopting logistics outsourcing, in all attempts to overcome dependencies in terms of resource acquisition and improve an organization service delivery. Most organizations are not self-sufficient hence the need to come up with mechanisms such as adoption of logistics outsourcing in order to facilitate perfect performance and effective service delivery, to meet the market requirements and hence customer satisfaction (Halldorson, Kotzab, Mikkkola & Larsen, 2007).

2.2.2 Transaction Cost Economics Theory

The Transaction Cost Economics Theory (TCE) affirms that production economics determine transactions. In accordance to the theory, companies are economic factor that utilize of the majority of effective means for dealings (Handfield and Pannessi, 2002). The theory brings out an analytical framework which is used in ascertaining comparisons amid acquiring services from third parties and internal services (Lacity & Hirschheim, 1995). The theory supports the purpose of outsourcing achievements for financial profit. TCE gives the sound assessment to assist companies in deciding on what to outsource, uncertainty of relationships is some of the major determinants of the amount of the costs of logistics processes. TCE deals with not only experience but also outcomes of logistics drivers. Asset specificity, small numbers bargaining, and imperfect information are the experiences to logistics processes of which they have a negative relationship with the logistics drivers. The theory is linked to the area of research based on the decision making process on which logistics drivers to adopt or outsource, there is need for firms to assess the cost implications involved (Ackman, 2000).

2.2.3 The Resource Based View

The Resource Based View theory supports concept of resources (Wernefelt, 1984). Barney (1991) first formalized the RBV perspective into a theoretical framework while clarifying the understanding of the force of company's environment on the company's function and effective delivery of service. "A company's income attributes to information, assets, processes, capabilities, and information guarded by the company that facilitates a firm to implement and conceive strategies and mechanism that develop its effectiveness and efficiency" Barney (1991). The company's income can be divided into three different categories namely human capital resources, Physical capital resources and organizational capital resources The RBV theory makes two assumptions, which jointly permit for differences in the company's income endowments to exist and continue over period (Mahoney & Pandian, 1992). Companies hold incomes that are important and rarely do they attain competitive advantage and in the short term enjoy better service delivery (Barney, 1991). A company can maintain these returns ultimately if its income

must be non-substitutable and inimitable. This theory is associated to this study in the aspect that decision making process on what logistical drivers to adopt, are purely depended on the availability of a particular company's incomes, mostly economic income due cost implications (Dierick & Cool, 1989).

2.3 Logistical Drivers of Emergency Supplies

The logistical drivers are what the firms rely on when moving people, goods, material and equipment along the supply chain parties. Logistical drivers include a broad range of business functions namely: inventory, packaging, material handling, logistics information systems warehousing, management, and transportation. The logistical drivers consist of warehouses, distribution centres, suppliers, retail outlets, and also raw material, work-in process inventory, and finally finished goods that flow between different facilities which form a part of the network (Bozarth & Handfield, 2006). Making goods and services available to the place where there is demand for the product is one of the main logistical drivers' functions (Sandwell, 2011). Firms must be the capable of receiving orders from customers, pick transportation companies to deliver the products and implement a billing, invoicing system to facilitate payments, and fulfil the orders via network of warehouses (Baltzan & Philips, 2010). Logistical drivers cover functions for example warehousing, transport, inventory management, packaging, and cargo handling and information exchange service (Bazhin, 2003).

The element in economic development is transportation. Transportation is strengthened by the formation of market economic relations as well as with his direct participation formed with regional commodity markets. It turns out to be pretty urgent as transport warrant quicker turnover of capital, delivery of finished products since it directly affects the economic interest of both producers and customers (Walton, May & Haselkorn, 2011). One of the most visible essentials of logistical divers is transportation. All business companies, apart from the product it distributes or produces, needs the movement of goods from the source to the customer and therefore is involved in transportation. Transportation basically concerns the spatial measurement of the business firm. "The spatial measurement is the ecological relationships and mirrors the

arrangement of company's markets, competitors and materials sources. The function or purpose of transportation is to serve as a linking amid the spatially unconnected aspect in company's individual business (for example from store to plants) and between units of the company other firms plus individuals (such spatial relationship of the firm is good transportation (Kovács & Spens, 2009). The methods of transport have their own technical base and material, documentation, technical and operational performance. Professionals in supply chain should be conversant of these elements in logistics that arise in practice for explaining logistical challenges. The important logistical driver is transportation which is linked with the movement of stock motor vehicle on and exacting equipment, consisting of logistical driver, customs procedures risk insurance, and packaging and transfer of ownership of the goods (Pierre, 2003).

Logistical drivers implements, plans storage of goods, controls the effective and efficient services and related information between the source and the consumption in order to meet customer's need, forward and reverse flow, The inventory hold an important decision in warehousing for example where the success of physical distribution inventory cost is as high as 30-40 percent then just-in-time (JIT) concept inventory decision would be recommended since it is rapidly becoming popular with a number of firms. The choice concerning the quantity of inventory depends on the approximate of product demand. An accurate approximates of the demand assist in holding the right stock point plus manages stock expenses. It assists both company in terms of supply of customers in time out and the cost of inventory however, it maintains the production of a reliable point (Sandwell, 2011). Important factors influencing the stock levels includes; the degree of accuracy of the sales forecasts, the firm's policy regarding the customer service level, responsiveness of the distribution system, that is capability of method to convey stock requests to the industrial unit and get the goods in the marketplace. Inventory cost comprise of replenishment cost which includes the manufacturing cost, holding cost including tied up capital, cost of warehousing, and obsolescence (Prokhorova et al., 2016). Inventories exist at every stage as complete supplies, incomplete merchandise or unprocessed material. Stocks can be in-process between facilities. Inventory main purpose is to cushion against any unlikelihood that may be present. Inventories holding cost can be anywhere between 30 to 40 per cent of their value, this means the well-organized

organization would be critical in supply chain operations. The majority of researchers have advanced the organization of inventory from a functional perspective including control policies, reorder points, deployment strategies (push versus pull), setting safety stock levels at each stock area and determination of the optimal levels of order quantities. The phases are major, as they are crucial determinants of the customer service delivery (Ailawadi & Singh, 2005).

Facility is the warehouse of finished goods material and raw material for example storeroom and tangible physical placement of work in process (Shahzadi, Amin, & Chaudhary, 2013). The undertaking of supply chain management performance be necessary in favour of the easiness of facilities managing in delivery service inconveniences. It is an excellent endeavour to rise above the gap between supply and demand of facilities administration. Facility is one of the logistical drivers and thus would be efficiently controlled by strategically setting up supply chain management through faster services and by reducing facility management costs. Facility location represents probable source of service and cost performance improvement (Ravet, 2012). Facility as logistical driver comprises of a various planning performance, these are focussed towards making sure every necessary semi-permanent or permanent functioning and support facilities (for example storage, ground and warehouse maintenance, operational testing plus instance training) are accessible simultaneously with fielding the system. Preparation has to complete including the need for new structure as well as the renovations to active amenities. It comprises of impact of facility locations, ecological forces, support needs and upgrading, room needs, life cycle cost, time or regularity of safety, health and use standard's needs, and security limits. This consists of every useful need, together with mobile plus fixed amenities, with importance on unique or resources restrictive needs of scarce (Kovacs & Spens 2011).

2.4 Service Delivery

Service delivery can be defined as a kind of intangible economic function, which is not kept or owned. Service delivery includes any type, asset of knowledge, exchange of information; also consist of the supplier relations management plus development

(Romano & Giannakins, 2000). Service delivery is concerned with the when, how, and where a service item is delivered to the buyer and whether this is just or unreasonable in nature (Martins & Ledimo, 2015). An organization can be improved by the amalgamation of supply chain leading to better service delivery and more efficiency. Service delivery acts a key element in the process of service good organization and quality of clients (Gronroos & Ojasalo, 2004). Organizations measure their service delivery by first assessing the lead time that is a key feature of delivery service. Various elements that add to lead time comprise of delivery strategies as well as procurement, transport choice and supplier location (Beamon, 1999). Service delivery can also be measured by applying e-servqual process by taking into account components like assurance, tangibles, flexibility, and receptiveness with elasticity determining businesses capability to respond to diverse needs and time taken in delivering customers' needs (Slack, 1999).

Management is an instrument efficient for service delivery to help the workforce in giving custom-made services which measure up to exact needs of business (Corbett, 2004). A successful service delivery demands that every process of service delivery has to be in a facility at the same time (Martin & Pimhidza, 2013). A framework of quality service measurement uses the following service dimensions; responsiveness, reliability, assurance empathy and tangibility (Zeithmal, 2006). Service delivery can be segmented into image functional, and technical. The service delivery is deemed to be of quality when it is efficiently and effectively achieved while the organization focuses on of the recognized quality sector. The consumer associates with Technical quality service segments which are the attributes which a service. The Functional service part eludes that, technology, methods and systems are the individual aspect implicated in service delivery. The consumer interprets image as an association of the class of persons or users of a facility (Gronroos, 2000). Customer satisfaction is applied to describe and measure the value of service delivery. A service is of quality if it measures up or exceeds the customer's quality expectations (Zeithmal et al., 2006). Service delivery is a procedure concerned with perceptiveness of the customer expectations in modifying organizational procedures to go well with customer's expectations and managing the human aspect which really relate with the customer (Akomea et al., 2011). An ideal delivery of service

is the entirety of an organization procedure which indirectly or directly influences service quality being delivered (Mellat et al., 2008). Ex-ante expectations are anticipations about a service before encounter and ex-post perception is the reality after experiencing the service. Ex-ante expectations are created after an initial encounter with a service or are acquired through promises in advertisement, advocacy, word of mouth or references. Ex-post perception is the reality about the service and occurs after using the service at least more than once. Service delivery occurs through keeping of promise and maintaining consistence in providing appropriate service delivery mechanisms (Kiragu & 2015). Consistency in good quality service leads to positioning of the appropriate logistics drivers to ensure customer's satisfaction. Regardless of the customer segment , timely delivery is a key role of service delivery (Murfield, Boone, Rutner & Thomas, 2017).

2.5 Summary of Literature and Research Gaps

Research on logistical drivers and service delivery has developed over decades. as shown in the table below. Thiong'o (2014) initially studied the determinants of logistical functions outsourcing which found out that Supplier 's competence contributed mostly to logistics functions outsourcing followed by performance of pharmaceutical metrics which had the effect on logistics function outsourcing later built on by Mogaka (2015) who studied the influence of reverse logistics and found out that adoption of reverse logistics practices, recycles landfill and reuse leads to logical drivers and service delivery. Internationally, Kovács and Spens continued to grow this area by studying Identifying challenges in humanitarian logistics which close to this study and found out that one major challenge is the coordination of logistical drivers. As shown in Table 2.1, much of the studies which have been undertaken on the logistical drivers however, did not address the logistical drivers of emergency supplies and service delivery in hospitals in the undertaken.

Table 2.1: Empirical Literature Review Summary

Author	Study	Research methodology	Major findings	Research gap
Mogaka (2015)	The reverse logistics practices and influences on the returns of new products on performance of pharmaceutical companies in Nairobi County, Kenya	Descriptive cross-sectional survey	Adoption of reverse logistics, practices, recycles landfill and reuse.	Conceptual Gap There is a Gap in establishing the relationship of the logistical drivers and the service delivery.
Thiongo (2014)	The determinants of logistical functions out sourcing	Descriptive	Supplier's competence contributed mostly to logistics functions outsourcing followed by performance of pharmaceutical metrics which had the effect on logistics function outsourcing	Conceptual Gap There is a Gap. In determining the relationship between the logical drivers and the service delivery
Kovacs and Spens (2009)	Identifying challenges in humanitarian logistics	Descriptive	Coordination of logistics activities Challenges	Conceptual Gap There is a Gap in identifying the logistical drivers

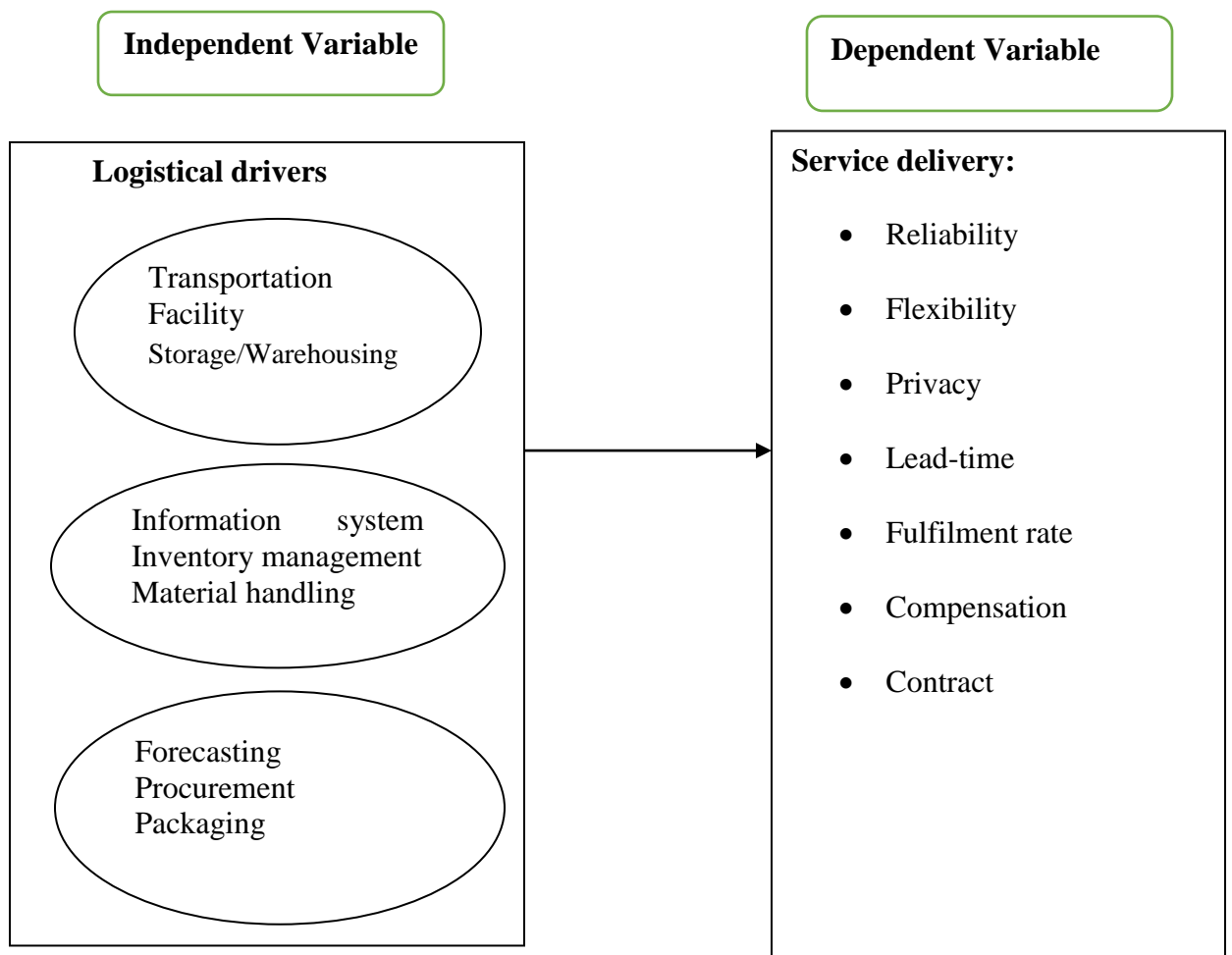
Source: Researcher, 2019

2.6 Proposed Conceptual Framework

Figure 2.1 presents the conceptual frame work with service delivery as dependent and logistical drivers as independent variables The three logistical drivers; facility which depends on location and capacity of the hospital while the inventory, depends on the firm's re-order level and lead times finally, transportation depends on the accessibility of the roads, the distance, plus means/modes of transport. The relationship between the logistical drivers of emergency medicines and service delivery is that, all of the above components are closely linked and malfunction of any of the links will affect the service

delivery. For example, if the transport of a consignment of emergency supplies is organized correctly, however upon arrival it turns out that no arrangements were made for storage (facility), the effectiveness of the transport will be of no use. Alternatively, if there is enough space but no transport to deliver the emergency medicines, the success of the facility components will be futile, since they were not properly synchronized with the transport component. The proposed conceptual framework in Figure 2.1 represents the guide to this research.

Figure 2.1: Proposed Conceptual Framework



Source :Adopted From Murfield et al., 2017

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The section indicates description of the methodology applied to conduct the research. It comprised of various sections such as, data collection analysis technique study population, sampling technique, research design and that was used to identify the three logistical factors and to establish the relationship between the service delivery by Hospitals Nairobi, Kenya and the logistical drivers

3.2 Research Design

A research design refers to detailed summary of how the overall approach incorporates the various mechanisms of the study in a rational and reasonable way to effectively tackle the study problem. Saunders, Lewis & Thornhill (2019) define it as the plan on how to answer study questions. The study was descriptive survey design to determine logistical driver's emergency of supplies and service delivery in Nairobi Hospitals. Gay (1999) depicts a survey as an effort to gather data from elements of a population so as to establish the status of that population with respect to single or other variables.

3.3 Study Population

According to Kenya Pharmaceutical Association (2016) and Otieno (2019) there are one hundred and fifty (150) pharmaceutical firms in Kenya and seventy-two (72) hospitals in Nairobi, Kenya as per the attached appendix II and III respectively.

3.4 Sample Size

A sample is part or a fraction of the population of concern. A perfect sample ought to be sufficient so that the reliability and validity of the information is achieved Wiersma (2000). That is if a similar research is performed with different sample size similar information will be collected. Cohen, Manion and Morrison (2007) states that there is no precise sample size which is the total of all the people or items that have certain characteristics which are of interest to a researcher. Yamane`s (1967) formula was used to arrive at appropriate sample size:

$$n = \frac{N}{1+N(e)^2}$$

Where $e=0.05$, N =Population size. Inserting the population size (222) in the formula above, we obtain a sample size of 142.

$$n = \frac{222}{1 + 222(0.05)^2} = 142$$

Therefore, proportionate sampling for each population is arrived at by:

$$n_1 = \frac{150}{222} * 142 = 96, \textit{ pharmaceuticals}$$

$$n_2 = \frac{72}{222} * 142 = 46, \textit{ Hospitals}$$

The study targeted 96 pharmaceutical firms and 46 hospitals in Nairobi.

Table 3.1: Sample Size

No	Target sample	Total number to be interviewed
1	Pharmaceuticals firms	96
2	Hospitals	46

Source: Researcher, 2019

3.5 Data Collection

The research collected primary data. Semi-structured questionnaires comprising opened-closed-ended questions were used to collect data. In the study target population the researcher picked one pharmacist and one manager from each hospital and pharmaceutical firm respectively (Woosley,2009) These target participants were assumed

to have adequate knowledge about the logistical drivers of emergency supplies and service delivery.

3.6 Data Analysis

After data collection, the filled-in and returned questionnaires was edited for completeness, coded and entries made into Statistical package for social sciences (SPSS version 21). This ensured that the data are accurate, consistent with other information, uniformly entered, complete and arranged to simplify coding and tabulation. With data entry, the data collected was captured and stored. Descriptive analysis was conducted, which involved the use of frequencies in their absolute and relative forms (percentage). Mean and standard deviations was also used as measures of central tendencies and dispersion respectively.

Inferential statistics involved making generations, predictions or conclusions about characteristics of a sample from a population. Inferential statistics was used to establish the relationship between logistical drivers of emergency supplies and the delivery services by hospitals in Nairobi, Kenya. This will help in making relevant generalizations whereby a Pearson correlation co-efficient was calculated to determine and test the correlation between the dependent variable and each independent variable.

CHAPTER FOUR : RESULT, ANALYSIS AND DISCUSSION OF FINDINGS

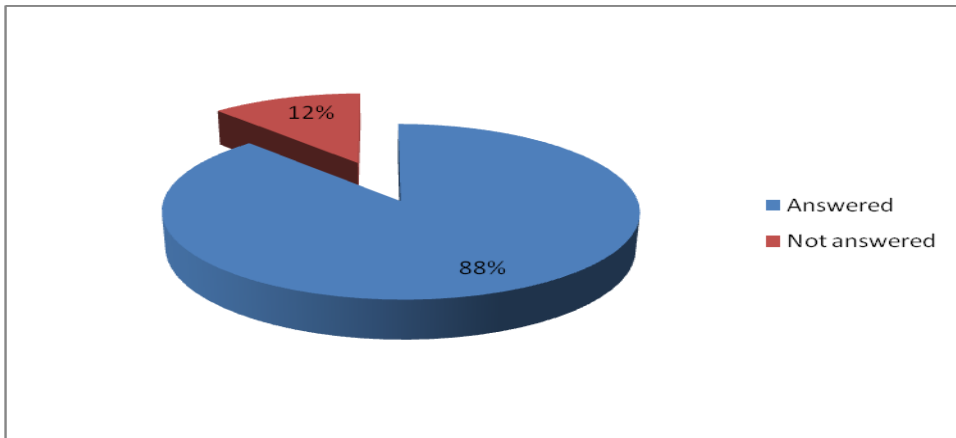
4.1 Introduction

This chapter entails the descriptive statistics in terms of mean and standard deviation. Inferential statistics the estimate the parameters using regression analysis was also presented in this chapter. Finally, detailed discussion of the findings was presented in the last section of this chapter.

4.2 Response rate

The study targeted 142 respondents out of which 125 answered the questionnaires making a response rate of 88% which is considered excellent. Table 4.1 illustrates the response rate.

Figure 4:1: Response rate



Source: Research Data, 2019

4.3 Logistical Drivers of Emergency Supplies

The first objective of the study was to establish logistical drivers of emergency supplies by hospitals in Kenya. The following logistical drivers were identified: Transportation, facility, storage, information system, inventory management, material handling, forecasting, procurement and packaging. All the logistical drivers are essential as

demonstrated by the approval rate above 90%. The respondents agreed 100% that transportation, storage, inventory management, information system, procurement and packaging are all logistical drivers of emergency supplies of hospitals in Nairobi. 93% of the respondents agreed that forecasting and material handling are logistical drivers of emergency supplies while the remaining 7% refuted that forecasting and material handling do not act as Logistical drivers of emergency supplies. This therefore imply that the logistical drivers which have been identified to have 100% are vital to all the hospitals in Nairobi and they are the most essential ones which act as logistical drivers and hospitals cannot do without them. On the other hand, material handling and forecasting to some small extent do not act as logistical drivers of emergency supplies in hospitals as per the respondents.

Table 4.1: Logistical Drivers

Logistical Drivers	Response	Frequency	Percent
Transportation	Yes	87	100
Storage	Yes	87	100
Information system	Yes	87	100
Inventory Management	Yes	87	100
Material handling	Yes	81	93.1
	No	6	6.9
Forecasting	Yes	81	93.1
	No	6	6.9
Procurement	Yes	87	100
Packaging	Yes	87	100

Source: Research Data, 2019

4.4 Logistical Drivers and Service Delivery

The second objective was to establish the relationship between logistical drivers of emergency supplies and the delivery services by hospitals in Nairobi, Kenya. This was achieved through regression analysis where we estimated the coefficients of the dependent variables.

4.4.1 Regression Model Summary

Table 4.3 shows the regression model of the study. From the table, the value of R square is 0.698. This translates to 69.8% which imply that the model is statistically fit and that logistical drivers of emergency supplies account for 69.8% of the changes in service delivery.

Table 4.2: Regression Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.835 ^a	.698	.650	.55404

b. Predictors: (Constant), Transportation, Facility, Storage, Information System, Inventory Management, Material Handling, Forecasting, Procurement, Packaging

Source: Research Data, 2019

4.4.2 Analysis of Variance

At 5% level of significance, Table 4.4 shows that the calculated value of F is 14.630 while F critical is 4.491. This implies that the study model is statistically significant. This is supported by the p value of 0.00 which is less than 5%. Hence, logistical drivers of emergency supplies are an appropriate predictor of service delivery by the hospitals in Nairobi.

Table: 4.3: ANOVA Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.472	8	4.491	14.630	.000 ^b
	Residual	5.832	29	.307		
	Total	19.304	37			

a. Dependent Variable: Service delivery

b. Predictors: (Constant), Transportation, Facility, Storage, Information System, Inventory Management, Material Handling, Forecasting, Procurement, Packaging

Source: Research Data, 2019

4.4.3 Regression Coefficient

The regression coefficient was used to determine how Logistical drivers of emergency supplies influence service delivery by hospitals in Nairobi. The coefficient model shows the results on how Transportation, Facility, Storage, Information System, Inventory Management, Material Handling, Forecasting, Procurement and Packaging influence the service delivery. Table 4.2 implies that transportation, facility, storage/warehousing, inventory management, procurement and packaging are all key logistical drivers and have a very strong relationship with service delivery. This is because they have a p value of less than 5%. This is supported by the fact that the t values are greater than the p values. Information system, material handling and forecasting were found to have a positive but insignificant relationship with service delivery as shown by their respective p values which are greater than 0.05 (5%).

Table 4.4: Regression coefficients

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.122	.251		.487	.001
	Transportation	.219	.104	.103	2.105	.000
	Facility	.030	.021	.100	1.423	.031
	Storage/Warehousing	.008	.013	.042	2.598	.044
	Information System	.021	.011	.140	1.985	.061
	Inventory Management	.021	.008	.215	2.728	.007
	Material Handling	.302	0.61	.624	4.913	.076
	Forecasting	.355	0.72	.725	5.783	.067
	Procurement	.091	0.28	.381	3.212	.041
	Packaging	.397	.080	.439	2.956	.031

Source: Research Data, 2019

4.5. Discussions and Findings

This section discusses the finding in relation to the literature and objectives of the study. The first objective sought to identify the logistical drivers of emergency supplies. The findings indicate that all the logistical drivers were essential as demonstrated by the approval rate of above 90% as indicated by the respondents. The respondents fully agreed (100%) that transportation, storage, information system, inventory management, procurement and packaging were the logistical drivers of emergency supplies used by hospitals in Nairobi. 96% of the respondents affirmed that material handling and forecasting are the other logistical drivers of emergency supplies by hospitals in Nairobi. The findings are supported by the literature as Walton, May and Haselkorn (2011) note that one of the most visible essentials of logistical drivers is transportation. Pierre (2003)

adds that the important logistical driver is transportation which is linked with the movement of stock motor vehicle on exacting equipment, consisting of logistical driver, customs procedures risk insurance and packaging and transfer of ownership of the goods.

Ravet, (2012) observes that facility is one of the logistical drivers and thus would be efficiently controlled by strategically setting up supply chain management through faster services and by reducing facility management costs. Sandwell (2011) opine that making goods and services available to the place where there is demand for the product is one of the main logistical drivers' functions. Bazhin (2003) add that Logistical drivers cover functions for example warehousing, transport, inventory management, packaging, and cargo handling and information exchange service. Ailawadi and Singh (2005) affirm that inventory holds an important decision in warehousing for example where the success of physical distribution inventory cost is as high as 30-40 percent then just-in-time (JIT) concept inventory decision would be recommended since it is rapidly becoming popular with a number of firms. Sandwell (2011) concludes that an accurate forecasting assist in holding the right stock point plus manage stock expenses. It assists both company in terms of supply of customers in time out and the cost of inventory however, it maintains the production of a reliable point.

The second objective sought to establish the relationship between logistical drivers of emergency supplies and service delivery of hospitals in Nairobi. The findings conclude that there is a positive and significant relationship between logistical drivers of emergency supplies and service delivery. Transportation, facility, storage, inventory management, procurement and packaging were all found to have a positive and significant relationship with service delivery. Information system, material handling and forecasting were found to have a positive but insignificant relationship with service delivery of hospitals in Nairobi. The findings are consistent with the literature as Ailawadi and Singh (2005) established that Application of logistical organization concept tends to reduce the total logistics costs and improve timely delivery of products. Goyet (2010) adds that the synchronization of facility, inventory and transportation play an important role in ensuring that the emergency supplies are easily accessible to the patients especially during an outbreak, accidents and certain weather conditions that may

cause an urgent medical attention. Kobersy, Shkukin, and Bogoviz (2014) conclude that Logistical drivers are the most efficient, market-oriented mechanisms for the performance of economic returns which functions in the world of produce circulation structure, as a way of development, planning and formation of the material flows with financial costs and minimal time.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter provides a presentation of findings, the conclusions and recommendations of the study. Relevant literature reviews have been considered giving the conclusions and opportunities for future studies in logistical drivers of emergency supplies and service delivery by hospitals. Based on the findings as moderated by the study objectives, the chapter also points out the limitations of the research. The objectives of the study were;

- i) To identify logistical drivers of emergency supplies by hospitals in Nairobi, Kenya.
- ii) To establish the relationship between logistical drivers of emergency supplies and the delivery services by hospitals in Nairobi, Kenya

5.2 Summary of findings

The study targeted one hundred and forty-two respondents out of which one hundred and twenty-five questionnaires were filled and returned. On the first objective, the findings established that the logistical drivers which are used fully by the hospitals were transportation, facility, storage, information system, inventory management, procurement and packaging. All the logistical drivers had above ninety percent rating meaning that the hospitals in Nairobi are using them as a strategy in their respective hospitals.

On the second objective, the findings indicate that transportation, facility, storage, inventory management, procurement and packaging all had a positive and significant relationship with service delivery of hospitals in Nairobi. Information system, material handling and forecasting were found to have a positive but insignificant relationship with service delivery of hospitals in Nairobi.

5.3 Conclusion

The findings indicate that logistical drivers of emergency supplies significantly and positively influence service delivery's, responsiveness, reliability, flexibility, privacy, tangibility, lead-time and fulfilment rate, compensation and contract. To enable efficient

service delivery hospitals should be encouraged to embrace logistical drivers. This will enhance not only better service delivery but also earn them a good public image. Logistical drivers are thus a worthy strategy which the hospital should be committed to in order to remain relevant in health care. It can be concluded transportation, facility, storage, inventory management, procurement and packaging positively and significantly influence delivery's, responsiveness, reliability, flexibility, privacy, tangibility, lead-time and fulfilment rate, compensation and contract.

5.4 Recommendations.

The study recommends that, in order to achieve a better service delivery, logistical drivers should be embraced by the hospitals and pharmaceutical firms. From the findings, the study recommends that transportation, facility, storage, inventory management, procurement and packaging should be adopted as strategies by hospitals if they are to meet efficient service delivery. This is because the mentioned logistical drivers have been established to have a significant relationship with service delivery. The study also recommends that forecasting and material handling should be fully utilised by the hospitals since the findings indicate that they were not used a hundred percent.

The Ministry of Health ought to set aside funds to be used by public hospitals for prompt payment of emergency supplies and also ensure that KEMSA is well equipped to handle emergency supplies. The pharmaceutical firms also ought to embrace use of motor bikes for emergency supplies in order to beat traffic jams and orders or the requisitions to be placed in good time so as to avoid stock outs. This is due to the fact that transportation was found to have a positive and significant effect on service delivery.

5.5 Limitations

The response rate was 88% and therefore, the research did not achieve 100% response since during survey, the target groups who were the hospitals pharmacists and the owners of the pharmaceutical firms were engaged in meetings or other things and a lot of time was consumed while waiting for the questionnaires to be completed. Others also had a

policy of not sharing the company's information thus the questionnaires could not be filled.

Although, the population was big enough and can act as a representative of the entire population while the results can give a clear indication on what others are practicing, the study was limited only to hospitals and pharmaceuticals in Nairobi, Kenya and thus these findings may not represent the entire country. However, the limitations have to be seen as positive indicators to continuous improvement.

5.6 Suggestions for Further Studies

The research revealed various gaps that can be addressed in further studies. The research was done on logistical drivers of emergency supplies and service delivery in Nairobi, Kenya. Other logistical drivers which were not covered in this study should be investigated to establish the extent to which they relate with service delivery.

Logistical drivers for emergency supplies can be explored further to determine how it influences either operational or organisational performance. It can also be explored to see how it gives an entity competitive edge either in the hospitals or other sectors.

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APPENDIX I: QUESTIONNAIRE

1. Section A: Emergency supplies logistical drivers.

Please indicate whether they are applicable in your firm

Below is a list of logistical drivers used in service delivery of emergency supplies.

Tick as appropriate

NO.	Logistical drivers of emergency supplies	YES	NO
1.	Transportation		
2.	Facility		
3.	Storage /Warehousing		
4.	Information systems		
5	Inventory management		
6.	Material Handling		
7.	Forecasting		
8.	Procurement		
9.	Packaging		

2. Mention any other emergency logistical drivers

APPENDIX I: QUESTIONNAIRE

2. Section B: logistical drivers of emergency supplies and service delivery by hospitals in Nairobi, Kenya

To what extent does the logistical drivers relate to the service delivery? (Where 1= Very Great Extent; 2 = Great Extent; 3 = Moderate Extent; 4 = Small Extent; and 5 = Very Small Extent)

	Service Delivery	1	2	3	4	5
1.	Lead Time: The pharmaceutical firm delivers emergency supplies in good time					
2.	Reliability: The transport mode used by the pharmaceutical firm to deliver the emergency supplies is reliable					
3.	Tangibility: The pharmaceutical firm responds immediately					
4.	Flexibility: Emergency supplies are in good condition at the time of delivery					
5.	Fulfilment Rate: The Fulfilment rate is met by the pharmaceutical firm					
6.	Privacy: During the time of delivery of emergency supplies privacy is observed.					
7.	Contract: The validity of delivering					
8.	Timeliness: The requisition for emergency supplies raised in good time					
9.	Reliability: The location of the facility near the hospital to ensure timely delivery and ease access of emergency supplies to the customer.					
10.	Compensation: Orders are made when the emergency supplies are out stock					

3. Provide any other suggestion(s)

Appendix II

Pharmaceutical Firms in Nairobi

1	AB Pharmaceuticals Ltd	21	Bora Biotech Ltd
2	Abacus Pharma (A) Ltd	22	British Pharmaceuticals Ltd
3	Accord Healthcare (Kenya) Ltd	23	Bureau Pharmaceuticals Ltd
4	Ace Pharmaceuticals Ltd	24	C Mehta (A) Limited
5	Adcock Ingram East Africa Ltd	25	Cadila Pharmaceuticals (EA) Ltd
6	Africa Medec Limited	26	Caroga Pharma Kenya Ltd
7	Ansell Pharmaceuticals Ltd	27	Cendco Pharmaceuticals Ltd
8	Apple Pharmaceuticals Ltd	28	Cistein Pharmaceuticals
9	Armicon Pharmaceuticals Ltd	29	Citylink Pharmacy Ltd
10	Astrazeneca	30	Comet Healthcare Ltd
11	Autosterile (EA) Limited	31	Concepts (Africa) Ltd
12	Barichem Pharmaceuticals Ltd	32	Cosmos Ltd
13	Bayer East Africa Ltd	33	Dafra Pharma Ltd
14	Bel EA Pharmacy	34	Dannes Pharmacy Ltd
15	Beryl Pharmacy Ltd	35	Dapco Pharmaceuticals Kenya Ltd
16	Beta Healthcare International Ltd	36	Dawa Limited
17	Bilmed Pharmacy	37	Diarim Entreprises Ltd
18	Biodeal Laboratories Ltd	38	Easton Pharmaceuticals Ltd
19	Biopharma Ltd	39	EDGE Pharmaceuticals Ltd
20	Biotech Pharma Ltd	40	Egypro East Africa Ltd

Pharmaceutical Firms in Nairobi

41	Eldohosp Pharmaceuticals Ltd	61	Imperial Health Sciences
42	Elys Chemical Industries Ltd	62	Infusion Medicare Limited
43	Eros Ventures Ltd	63	Isis Pharmaceuticals Ltd
44	Europa Healthcare Ltd	64	Jaskam & Company Ltd
45	Eurox Pharmaceuticals Ltd	65	KAM Industries Ltd
46	FAW Pharmaceuticals Ltd	66	Karuri Stores Pharmaceuticals Ltd
47	Galaxy Pharmaceuticals Ltd	67	Kentons Ltd
48	Glad Healthcare (K) Ltd	68	Krishna Chemists Ltd
49	GlaxoSmithKline	69	Kulal International Ltd
50	Glenmark Pharmaceuticals Ltd	70	Laboratory & Allied Ltd
51	Global Net-Medical Ltd	71	Laborex Kenya Eurapharma Ltd
52	Goodman Agencies Ltd	72	Lavensis Limited
53	Haripharma Pharmaceuticals	73	Lenana Pharmaceuticals Ltd
54	Harley's Limited	74	Limeridge Pharma Ltd
55	Hartlane Pharmaceuticals Ltd	75	Lords Healthcare Ltd
56	Highchem Pharmaceuticals Ltd	76	Mac Naughton Ltd
57	Highridge Pharmaceuticals Ltd	77	Madawa Pharmaceuticals Ltd
58	<u>High-tech pharmaceutical ltd</u>	78	Manhar Brothers (K) Ltd
59	Impact Chemicals Ltd	79	Martindale Pharma
60	Impact Pharmaceuticals Ltd	80	Max Pharmaceuticals Ltd

Pharmaceutical Firms in Nairobi

81	Maxim Pharmaceuticals Ltd	101	Omaera Pharmaceuticals Ltd
82	Medina Chemicals Ltd	102	Opera Pharma (K) Ltd
83	Medipoint Pharmaceuticals Ltd	103	Pan Pharmaceuticals Ltd
84	Medisel (K) Ltd	104	Pharm Access Africa Ltd
85	Medkam Pharmaceuticals EA Ltd	105	Pharma Specialities Limited
86	Medox Pharmaceuticals Ltd	106	Pharmaco Healthcare Ltd
87	Metro Pharmaceuticals Ltd	107	Pharmaken Ltd
88	MICA Pharmaceuticals Ltd	108	Pharmasell Limited
89	Micro Labs Ltd	109	Pharmediq Healthcare Solutions Ltd
90	Mission For Essential Drugs & Supplies	110	Phillips Pharmaceuticals Ltd
91	Modana Pharmaceuticals Ltd	111	Prodigy Pharmaceuticals Ltd
92	Modupharma Ltd	112	PSM Pharmaceuticals Ltd
93	Nairobi Pharmaceutical (K) Ltd	113	Pyramid International Ltd
94	Nextgen Pharmaceuticals (K) Ltd	114	Radiance Pharmaceuticals Limited
95	Nila Pharmaceuticals Ltd	115	Ram Pharmaceutical Ltd
96	Nilson Pharmaceuticals Ltd	116	Ran Baxy Laboratories Ltd
97	Njimia Pharmaceuticals Ltd	117	Rangechem Pharmaceuticals Limited
98	Novartis Pharma Services	118	Rapha Medical & General Supplies
99	Novelty Manufacturing Ltd	119	Regal Pharmaceuticals Ltd
100	Oceanview Pharmaceuticals Ltd	120	Ripple Pharmaceuticals Ltd

Pharmaceutical Firms in Nairobi

121	Rup Pharm Ltd	136	Surgilinks Limited
122	Sai Pharmaceuticals Ltd	137	Syner Chemie Ltd
123	Saicare Enterprises Ltd	138	Syner-Med Pharmaceuticals (K) Ltd
124	Salama Pharmaceuticals Limited	139	Three Pyramids Company Ltd
125	Sandoz GmbH Kenya	140	Transchem Pharmaceuticals Ltd
126	Sanofi Pasteur International	141	Transwide Pharmaceuticals Limited
127	Shifa Chem Ltd	142	Transwide Pharmaceuticals Ltd
128	Signature Healthcare Ltd	143	Twokay Chemicals Ltd
129	Simba Pharmaceuticals Ltd	144	Uni Supplies & Marketing (K) Ltd
130	Sonal Holdings (K) Ltd	145	Unisel Pharma (K) Ltd
131	Sphinx Pharmaceuticals Ltd	146	United Pharma (K) Ltd
132	Square Pharmaceuticals Ltd	147	Universal Corporation Ltd
133	Statim Pharmaceuticals	148	Wellmed Pharmaceutical Ltd
134	Suken International Ltd	149	Wessex Pharmaceuticals Ltd
135	Sunpar Pharmaceuticals Ltd	150	Zen Pharmaceuticals

Source: Kenya Pharmaceutical Association, 2016.

Appendix III

Hospitals in Nairobi

1	AAR Healthcare	21	Ladnan Hospital
2	Acacia Medical Center	22	Langata Hospital
3	Aga Khan University Hospital Nairobi	23	Lions Sightfirst Eye Hospital
4	Apples + Sense Hospital	24	Livewell Health Clinic
5	Armed Forces Memorial Hospital	25	M.P.Shah
6	Avenue Healthcare	26	Madina Nursing Home
7	Bristol Park Hospital	27	Maria Immaculata Hospital
8	Care Hospital	28	Mariakani Cottage Hospital
9	Chirimo Lane Medical Centre	29	Marura Nursing Home
10	Coptic Mission Hospital	30	Mathere Hospital
11	Family Care Medical Centre	31	Mbagathi District Hospital
12	Family Health Options Kenya	32	Medanta Africare
13	Garden Specialist Hospital	33	Mediheal Hospital
14	Getrude Gardens Children Hospital	34	Melchizedek Hospital
15	Guru Nanak Ramgarhia Sikh Hospital	35	Menelik Hospital
16	Jacaranda Healthcare	36	Meridian Equator Hospital Limited
17	Jamaa Mission Hospital	37	Meridian Medical Center
18	Jamia Medclinics	38	Metropolitan Hospital
19	Kasarani Maternity And Nursing Home	39	Midhill Hospital
20	Komarock Modern Healthcare	40	Mother and Child Hospital

Hospitals in Nairobi

41	Mp Shah Hospital	57	Scion Hospital
42	Nairobi East Hospital	58	South B Hospital
43	Nairobi Equator Hospital	59	St Mary Mission Hospital
44	Nairobi Hospice	60	St Patrick Healthcare Centre
45	Nairobi South Hospital	61	St. Francis Community Hospital.
46	Nairobi West Hospital	62	St. Mary's Hospital Langata
47	National Spinal Injury	63	St. Scholastica Uzima Hospital
48	New Langata Medical Centre	64	The German Medical Center
49	Oasis Healthcare Group	65	The Karen Hospital
50	Parklands Amilatory Surgical Centre	66	The Kenyatta Hospital
51	Penda Health	67	The Lifeline Group of Hospitals – Wendani
52	Radiant Hospital	68	The Mater Hospital
53	Reinha Rosary Hospital	69	The Nairobi Hospital
54	Ruai Family Hospital	70	The Nairobi Women Hospital
55	Ruaraka Uhai Neema Hospital	71	Wema Hospital
56	Savannah Healthcare Services	72	Westlands Medical Centre

Source: Otieno D, 2019.