FACTORS AFFECTING DISTRIBUTION PERFORMANCE FOR PHARMACEUTICAL PRODUCTS IN KENYA PUBLIC SECTOR

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ABSTRACT-

This study examined the factors that affect distribution performance for pharmaceutical products within the public sector in Kenya. Specifically it sought to investigate the effect of financial capacity, transport outsourcing, third party relations and use of information technology on the distribution performance of KEMSA. A survey approach was employed, using a stratified random sampling to ensure representativeness. Both quantitative and qualitative methods of data analysis were used. Descriptive statistics as well as correlation analysis were used to facilitate examination of the relationship between the variables of interest. The study findings indicate that relations with government & donors and transport outsourcing have the most influence on distribution performance followed by information technology and financial capacity respectively. The study points out that all the four factors namely; information technology, transport outsourcing, relations with government and donors and financial capacity showed great influence on distribution performance therefore should be given due attention.

Key words: Information technology, Transport outsourcing, Relations with government and donors, financial capacity, Distribution performance

INTRODUCTION

1.1 Distribution Systems

Logistics is increasingly becoming a strategic source of competitive advantage with the increase in global production sharing, shortening of product life cycles and intensification of global competition. In this highly competitive business environment, the quality of logistics has assumed greater significance influencing firms' decisions such as which country to locate in, which suppliers to buy from or which consumer markets to enter. Essentially, high logistics costs coupled with low levels of service are a barriers to trade and foreign direct investment (FDI) and thus to economic growth. Massive investments are being made worldwide with some of the best known investment gurus putting their bet on this industry which is directly linked to the growth of any economy (Prabhakarsri, 2010). Distribution is increasingly becoming a significant factor that can contribute to the realization of a successful organizational strategy.

Changing regulations and individual legislation in various countries, can affect a company's current supply chains (ceva 2010).Logistics is knowledge-based industry forming part of supply chain management (SCM) and involves among other things procurement, transport, inventory control and distribution of goods. Logistics can therefore be said to be the management of the flow of goods, information and other resources from the point of origin to the point of final consumption by the customer. The cost of logistics of a company is estimated to be around 2 % of its total sales. With effective and efficient logistics 20 % of this cost can be saved. Logistics and Supply Chain Management (SCM) have always been an integral part of any business for timely and cost-effective decision making (Prabhakarsri, 2010).

Yet one of the key aspects of logistics that has proved of great importance among pharmaceuticals is distribution. Distribution is an important activity in the integrated supply-chain management of pharmaceutical products (USAID, 2008).

In the same way as logistics management is gaining momentum in other industries, the pharmaceutical sector has also realized the importance of logistics as a source of strategic advantage. Pharmaceutical and healthcare companies operate within a highly dynamic industry. Several factors attend to the efficacy of distribution of pharmaceuticals. Members of the pharmaceutical supply chain have various global regulatory requirements to meet while handling, storing, and distributing environmentally sensitive products. Their focus is to provide cold chain management for temperature sensitive pharmaceuticals to ensure that the quality and efficacy of the product will not be compromised (Rafik and Bishara, 2006). Logistics has emerged as an important element in this corporate renewal as it becomes a greater percentage of total costs. Logistics costs currently comprise between 10% and 25% of the total cost of an international sale, and these costs are rising (Bartlett and Ghoshal, 1998). This increase occurs with the pursuit of more global market opportunities.

Increased market competition, globalization, and the need for quick response and lower inventory levels have created a need for more effective and efficient distribution systems in China's pharmaceutical industry. The environmental changes have forced management to re-examine their companies' distribution strategies and to seek new ways to improve their operations and cost effectiveness. Pharmaceutical distribution has emerged as an important element for reconfiguration as it occupies a large percentage of total products costs (Smith, 2009). According to Smith (2009), as part of its meteoric growth, China has invested significantly in logistics. Chinese spending in this sector as a percentage of GDP recently stood

at 18% (KPMG, 2008) compared to approximately 9% in the US and other Western economies. The industry is growing rapidly, with annual revenue growth of 18.1 percent in 2008 and 15 percent in 2009. Much of the credit for this must go to Chinese Government reform and massive infrastructure investments, such as a stimulus package dedicated to rural infrastructure, electricity and transportation over the next two years, which will help expand local demand both for imports and domestic products.

It is estimated that India being a developing economy may be spending as high as up to 13% of its GDP in Logistics. Indian economy is now worth more than US$ 1.25 trillion and as a consequent Logistics industry in India is worth more than US$100 billion. There is a scope for huge savings in terms of cutting down this cost by bringing in more efficiency in this sector by adopting some of the best practices. Also very few organized players are in this industry to which acts as an impediment in this direction. The logistics sector is considered the weak link of the Indian economic story. At present, there are few professionally founded logistics players (Prabhakarsri 2010).

1.2 Pharmaceutical Distribution:

Various automated systems have helped both carriers and exporting organizations improve their distribution function. One such system, MicroAnalytics, helps traffic managers solve their routing problems. This service can maximize vehicle usage, optimize routing to reduce mileage and better meet service requirements. It is reputed to enable users reduce distribution costs by up to 30 percent (Wolpert, 1999). Automation of the way customers submit purchase orders is yet another development in the pharmaceutical distribution sector. Electronic Data Interchange (EDI) reduces inventory, cuts costs and speeds product delivery.

Several companies have noted that speed of delivery is a logistics concern in satisfying international customers. Additional challenges for pharmaceutical firms include international product registration, time lags associated with the international distribution process and the great amount of documentation required internationally such as import licensing (Bartlett and Ghoshal, 1998).

The ability to obtain relevant data on purchased materials within a transportation network and on outbound goods as they are manufactured, stored or shipped has become a critical aspect of controlling supply chain flow, especially as global sourcing and fulfillment becomes more complex. The use of technologies can further enhance the efficiency in daily operations for faster and more accurate delivery. Technologies like track and trace systems can also increase the visibility of logistics end users, allowing customers to track their shipment or package and to know when the delivery will be performed. Warehouse management systems are also used by pharmaceutical manufacturers and distributors. There is also an increasing adoption of visibility tools like bar-coding systems. Pharmaceutical products may require more security, speedier delivery (especially for those with quick expiration dates), and special handling for those products with temperature restrictions (Javalgi and Reisenwitz 2001).

1. 3 Kenya Medical Supplies Agency (KEMSA):

KEMSA was established as a state corporation under the State Corporation act Cap 446 on 11th February 2000 under legal notice No. 17 with the mandate to procure, warehouse and distribute medical commodities to Kenya's Health facilities. KEMSA works to support the National Health Strategic Plan and the Kenya Health Package for Health in providing public health facilities with the "right quantity and quality of drugs and medical supplies" at the best market value". The

primary responsibilities of KEMSA include: developing and implementing a distribution system that effectively and efficiently deliver medical commodities to all public health facilities; developing a harmonized national procurement system in collaboration with the Ministry of Health and other stakeholders; and developing and evolving a world class integrated medical supply chain encompassing selection, forecasting, quality assurance, procurement planning, warehousing, logistics and customer service, among others (KEMSA, 2007).

KEMSA's distribution function is riddled with gaps and challenges that deter effective performance of the prescribed tasks. The organization distributes pharmaceutical products to 5018 health facilities located across the country, in quarterly cycles. The outsourced transport system does not meet good distribution practices and this has significantly threatened the quality of distributed commodities. In addition, volumes for non pharmaceuticals, equipment, and other supplies almost tripled without any corresponding investment in KEMSA's distribution budget to enable it cope with the increased volumes. Findings indicate poor supervision and management of the outsourced transport. The inefficiency and unresponsiveness of the KEMSA distribution system compared to competitors in the market exemplified by the high transport lead time and high transport costs as a percentage of turnover is of concern (NTF, 2008).

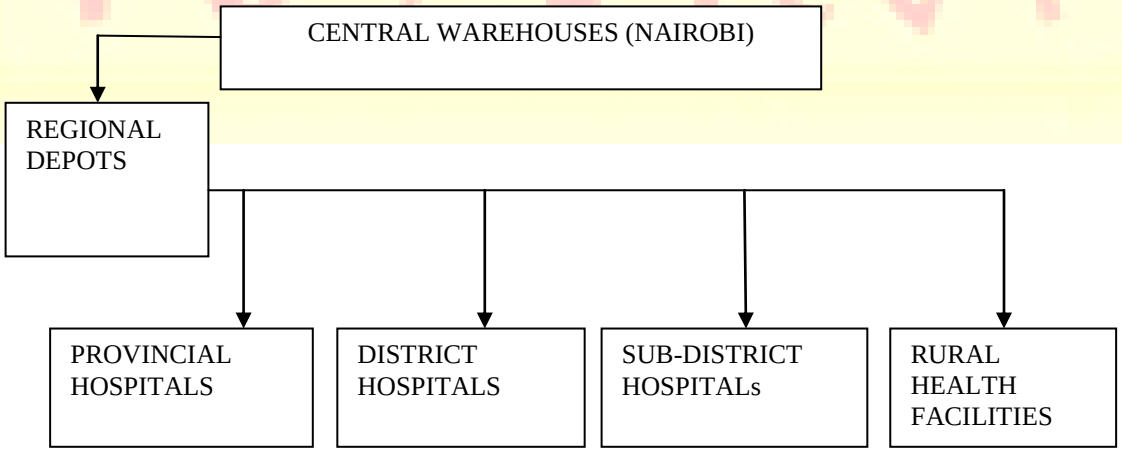

Figure 1: Current KEMSA Distribution Flow

2. Literature review

2.1 Distribution Performance

Shifting business environments are causing a growing number of IT managers to rethink how they handle distribution management. Growing dependence on extended and diffuse partner networks, for instance is creating new operational complexities that have put a strain on traditional management practices. IT managers are wrestling with how to integrate distribution management operations in new geographies with a wide range of systems -- from ERP applications, to inventory management and supply chain management packages. Pulling together information from a variety of sources also carries with it security concerns, including access control (Cooper, 2006).

According to NTF (2008), KEMSA uses a combination of both in-house and outsourced transport facilities to make direct deliveries to the respective facilities. Approximately 80% of all deliveries are done by third party transporters. Out-sourced transport is contracted on the basis of vehicular capacity required to serve at least one region. The more capacity a bidder has, the greater the chances of being allocated more than one region to cover. Contracts run for two years but are subject to renewal on an annual basis. The outsourced transport system has significantly complemented the KEMSA's distribution reach – to 100% coverage. Prior to 2005, KEMSA's transport system was 100% in-house and had only a distribution reach of 20% (2005 HERA – Kenya Pharmaceutical Review Study on procurement and logistics).

Another study by PETS, (2008) established that about 25 percent of health facilities experience stock outs of key drugs, kits and other commodities; stock outs of key medical supplies and

contraceptives and stock outs of non-pharmaceutical items therefore prompting the facilities to engage in direct purchase of the out of stock items. The duration for these stock outs averaged one month to six months. This could have far reaching implications on service delivery, procurement and supplies process in the ministry thus impacting on governance and corruption in the sector (KACC, 2008).

2.2 Factors affecting distribution performance for pharmaceutical

2.2.1: Financial capacity and distribution performance

According to Johnson (2006), performance of a distribution function in the public sector is strongly hinged on capacity and management of the finance function. Suitable and strong financial controls have to be maintained to ensure good financial management. Additionally, there must be capacity to prepare regular and reliable financial statements and has a system in place to safeguard programme assets. Computerized financial systems such as quick books and Business Vision Software can be useful in this regard. Another important aspect of financial capacity that is pertinent to distribution systems is the funding flow. This has got to do with the timeliness of receipt of funding to meet various requirements in the distribution processes.

Signing of agreements with donors or governments can be useful both as a regulatory mechanism and a means of guaranteeing the timeliness of receipt of funding. Distribution is an expensive undertaking, and requires careful channeling and management of funds. Fleet maintenance, dispatch personnel emoluments and other costs should be well handled to ensure continued performance (Stern and Heskett 1969). Cooper (2006) argues that there can never be an effective distribution if an organization is challenged financially. Finances are used to modernize fleet, to

compensate drivers, to buy enough stock for distribution and more importantly, to implement and maintain a robust information system. Thus, we propose the following hypothesis:

H1: There is a positive relationship between financial capacity and distribution performance.

2.2.2: Transport Outsourcing and Distribution Performance

Outsourcing, traditionally known as "make-or-buy" decision, is the act of contracting internal business activities to outside (either domestic or offshore) suppliers. In recent years, with the intensifying global competition, outsourcing has become such an increasingly popular option that there are few business functions that have not been partially outsourced. Outsourcing has been utilized as a means of reducing costs while maximizing output (Quelin and Duhamel, 2003; Johnson, 2006).

According to Wick (2000), success or failure in distribution depends on how carefully and continuously you manage this function to make sure your distribution partners are doing the job that is expected. Wick cautions that outsourcing is not a panacea - if the third-party distributor's procedures and performance are not carefully monitored, there is the risk of permanently alienating the existing customers who have been attracted through so much hard effort. Johnson (2006) observes that the key to a successful outsourcing relationship includes understanding the process, specifying objectives, establishing internal procedures for evaluating performance against objectives, and deploying systems that help to manage the function effectively. Thus, we propose the following hypothesis:

H2: There is a positive relationship between transport outsourcing and distribution performance.

2.2.3: Information Systems and Distribution Performance

Using Information system to manage distribution can increase efficiency and predictability and reduce waste in value chains and have positive impacts on all market actors (Ceva, 2010). Information system tools such as cell phone and Internet services, radio, and a wide range of digital devices and related tools including cameras, GIS, and a wide range of hand-held computing devices if appropriately used has a potential of creating efficiency in these distribution activities; record keeping, monitoring field agent activities, procurement operations, cre-dit and payment tasks, input distribution, measuring productivity, and forecasting (Cooper, 2006).Buyers use a range of management in-formation systems (MIS), from basic spreadsheets to complex software used to track resources and facilitate the flow of information. Increasingly, they are using mobile phone based systems for the "channel" to reach the suppliers or their own field agents (Cooper, 2006).

Another area which can benefit greatly from IT is vehicle routing. This is one of the most critical elements in managing a supply chain. Vehicle routing can be applied in various settings and usually consists of freight routing (shipments), service routing (dispatching of repair technicians) and passenger routing (people). The purpose of vehicle routing is to organize transport resources as efficiently and effectively as possible. With many customers, different route options and a set number of available vehicles, the task of coming up with an optimized routing plan can be daunting. In most organizations, vehicle routing is carried out by a person or persons working in the dispatch unit, with dispatchers having many years of local knowledge. But as routing becomes more complex, software applications can be used to help the transport manager or the supply chain manger come up with a good routing plan to move the flow of resources as they are transported on vehicles (USAID, 2008). Thus, we propose the following hypothesis:

H3: There is a positive relationship between information systems and distribution performance

2.2.4: Relations with Government and Donors and Distribution Performance

The importance of building partnerships among donor and government is improvement of service delivery (Cadotte and Stern 1979). When the donor work harmoniously with the host government they establish a common goal which they can use to guide in a coordinated way the application of the available resources and have more effective progress towards achievement of the goal. This specifically called on donors to intensify their efforts to corporate with the government in distribution of humanitarian requirement to various groups of people (Lambert, Boughton, and Banville, 1986). Lambert et al, (1986) also explained that the pressure donors bring to bear on partners' governments to deliver on their mandate and the donor aid management systems that are designed to meet specific performance largely result in improved service delivery.

However, in situations where there is poor relationship between the donor and the government, conflicts must arise unless proper systems are in place. Conflict resolution has consistently occupied a central role in models of the inter-organizational exchange process (Cadotte and Stern 1979; Frazier 1983) and is viewed as the primary mechanism for reducing manifest conflict in distribution channels (Assael 1968; Stern and El-Ansary 1988). Several broad strategic frameworks for addressing distribution channel conflicts have been proposed in the literature (Stern and Heskett 1969), but how conflict resolution processes emerge in distribution channels is unclear. However, other studies have implied that relations with government and donors have positively impacted on the distribution of humanitarian requirements by different government

agencies (Brown 1979; Butaney 1989; Lambert, Boughton, and Banville, 1986). Thus, we propose the following hypothesis:

H4: There is a positive relationship between relations with government and donors and distribution performance

2.3 Hypothetical model

The hypotheses presented in the previous section lead us to a theoretical model described in Fig. 2.1. Distribution performance factors are congregated into four constructs of financial capacity, transport outsourcing, information systems and relations with government and donors. The relationship between each constructs to distribution performance is thus conceptualized as below.

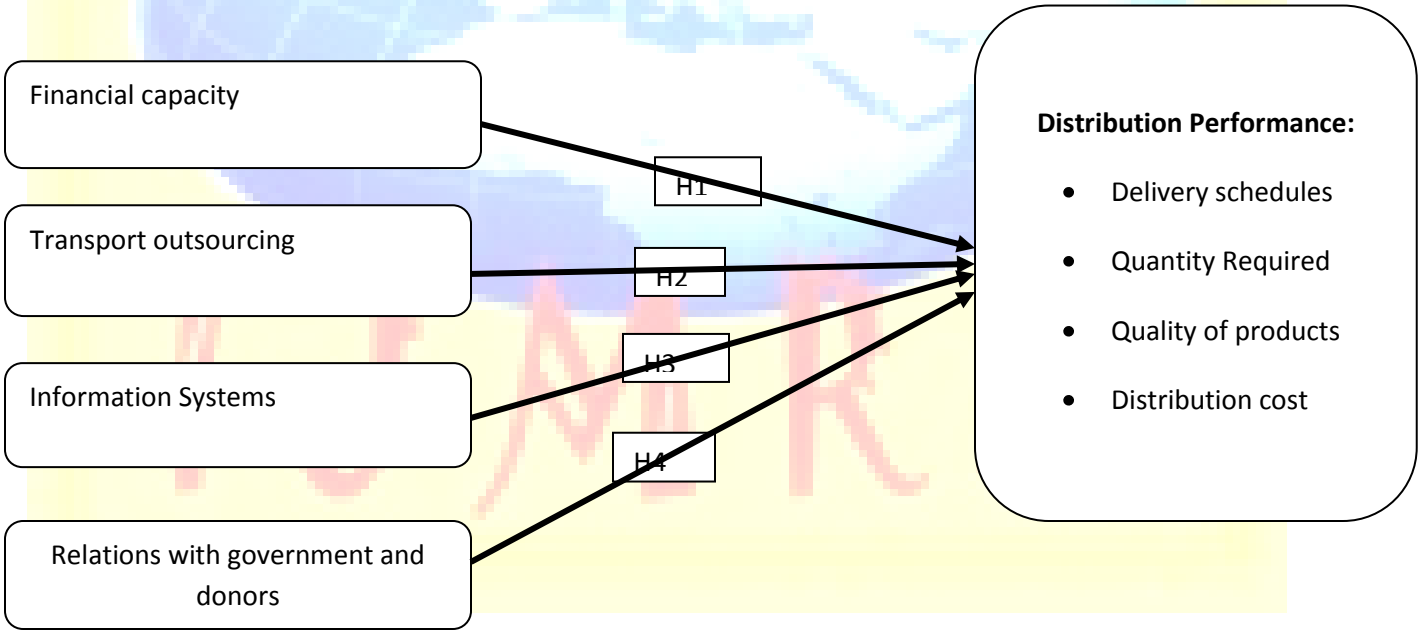

Figure 2.1: Factors affecting distribution performance (Angelmar, Reinhard and Louis, 1998)

3. Research Methodology

3.1 Research Design

This was a case study of Kenya Medical Supplies Agency (KEMSA). A descriptive research design was used in this study. According to Donald and Pamela (2006), a descriptive study deals with the what, how and who of a phenomenon which is the concern for this study. This research design is appropriate for this study because data required to meet the stated objectives can easily be obtained using questionnaires.

3.2 Population and sampling

A study population refers to the total number of individuals bearing the characteristic under examination from which the study sample is derived. It is that group of elements about which some inferences are to be made (Denscombe, 1998).The population of this study will be made up of the management team of KEMSA i.e. supervisors, level upwards which adds up to 144. The study used stratified random sampling technique to select 57 respondents which constituted 40% of the population. This sample was considered representative of the population (Kombo & Tromp, 2006).

3.3 Data collection Instrument and Procedure

A research questionnaire was used as the main instrument for data collection. The questionnaire was structured to provide for open and closed ended questions. The structure of the questionnaire comprised of various sections. The first section constituted the respondent's general information while the rest of the sections addressed each of the main variables. The questionnaire had been developed on the basis of research hypothesis and was administered by the researchers through hand delivery, courier and e-mail, ((Kombo & Tromp, 2006).

3.4 Data Processing and Analysis

Descriptive statistics was used to summarize the responses for each of the hypothesized factors. This included mean and standard deviation. On the basis of mean, points of consensus on the various factors were determined. Standard deviation was used to estimate the variability of the responses. Pearson correlation coefficient was used to evaluate the relationship between the conceptualized factors and distribution performance (Panneerselvam, 2005). Correlation analysis was deemed appropriate because the correlation coefficient was able to indicate both the strength and direction of relationship between distribution performance and the independent variables (Mugenda & Mugenda, 2003). The correlation coefficient ranges between -1 and +1 with -1 indicating perfect negative correlation, 0 indicates no correlation and +1 indicates perfect positive correlation between the variables (Kothari, 2004).The significance of the correlation was estimated using p-values at 5% significance level.

4.0 Study findings

4.1 KEMSA level of distribution performance

Apart from delivery of drugs under safe conditions which was rated good by 57% of the respondents, all other indicators of performance scored poorly. 76% of the respondents felt that KEMSA was poor in meeting delivery schedules. An overwhelming majority (97%) felt that vehicle routing and tracking was poor. Further, a majority (81%) of the respondents felt that transport vehicles were insufficient and poorly maintained. Additionally, a majority (89%) of the respondents felt that distribution performance monitoring and evaluation was poor. And finally, 52% of the respondents felt that there was poor professionalism in distribution.

4.2 Financial Capacity and Distribution Performance

The objective here was to investigate the influence of financial capacity on distribution performance at KEMSA. First, the respondents were asked to indicate whether they considered KEMSA financially capable to support distribution of medical supplies in the country. An overwhelming majority (96%) felt that KEMSA does not have adequate finances to effectively undertake its functions. Only 4% felt that it does. Under the same research objective, respondents were also asked whether financial capacity does affect distribution performance, an overwhelming majority (91%) of the employees felt that it does affect to a high extent.

The respondents were asked to rate the extent of influence by some financial indicators that are directly related to distribution. Majority (51%) of the respondents felt that KEMSA faces frequent challenges in meeting its obligations to transporters. Additionally, a majority (81%) felt that inadequate finances have hampered performance evaluation mechanisms. Majority (96%) of the respondents felt that lack of funds has led to failure to enhance depot capacity. Finally, a majority (98%) felt that funds were inadequate to maintain own fleet of vehicles.

The relationship between financial capacity and distribution performance was estimated using Pearson correlation coefficient. It was established that financial capacity has a positive correlation with distribution performance ($r = 0.329$). This correlation was found to be significant at the 5% significance level (p-value = 0.015).

4.3 Relations with Government, Donors and Distribution Performance

In trying to establish if the relations that KEMSA has with these stakeholders affects distribution performance, the respondents were asked to rate the extent to which these relations affect

distribution performance. Majority of the respondents (77%) said it affects to a high extent; 11% said it affects to a moderate extent and another 11% said it affects to a small extent. The respondents were asked to indicate the extent of influence guided by some indicators. Majority of them (79%) felt that there is insufficient coordination in the procurement of drugs between parent ministries, donors and KEMSA; 100% felt that the parent ministry sometimes dictates delivery of items thus interfering with KEMSA's schedules; 91 % believe there is frequent interference from uncoordinated purchase of short lifespan drugs by donors. Finally, 98% felt that the ministry often monitors specific drugs it purchases leaving no autonomy of scheduling to KEMSA

The relations with government and donors yielded a correlation coefficient of 0.488 which indicates a fairly strong correlation. This relationship was found to be significant at the 5% level of significance (P-value = 0.000).

4.4 Transport Outsourcing and Distribution Performance

The first question presented to the respondents to satisfy this research objective was whether they felt that it was supporting distribution performance. Majority (85%) said that outsourcing as currently undertaken by KEMSA is not supportive of good distribution performance, while 15% indicated it was indeed supportive. Secondly, the respondents were tasked to state to what extent they thought transport outsourcing affects distribution performance. A majority (78%) felt that transport outsourcing does affect distribution performance to a high extent.

The respondents were asked to indicate the extent of their agreement to some stated situations of distribution at KEMSA**.** Majority of the respondents (63%) said that there is no performance metrics for drivers' hence poor performance; further, majority (58%) said that trucks used are in

poor condition thus leading to constant breakdowns. An overwhelming majority (99%) said that tracking is not done for outsourced transportation hence frequent delays in deliveries. Correlation analysis was carried out to try and establish the extent to which transport outsourcing influences distribution performance. Transportation outsourcing was found to have a statistically significant fairly strong positive correlation with distribution performance with a correlation coefficient of 0.523 and p-value of 0.000.

4.5 Information Systems and Distribution Performance

Firstly, the respondents were asked to state whether they felt that information technology affects distribution or not. 97% answered in the affirmative while 3% indicated that it does not affect distribution performance. Secondly, the respondents were asked to rate the effect of information technology on distribution performance. A majority (93%) rated the effect to be high. Information technology has not been fully deployed and utilized at KEMSA. This is according to the responses to a series of statements posed to respondents. Majority (67%) of the respondents feel that Information technology systems have not been put in place for information sharing. Similarly, a majority (86%) of the respondents feel that KEMSA has not made full use of ICT in its distribution function. Yet another majority (95%) said that transport vehicles are not fitted with tracking devices to facilitate monitoring. Finally majority (94%) of the respondents felt that distribution function is not appropriately synchronized with the ordering, procurement and warehousing systems.

Correlation analysis revealed a strong positive correlation between information systems and distribution performance. This correlation was found to be statistically significant with a correlation coefficient of r = 0.498 and p-value = 0.000.

4.6 Discussion of Findings

According to Johnson (2006), the performance of any public sector distribution is strongly dependent on how the enterprise in question manages its finances. For KEMSA, there is no exception to this rule. The study established that financial capacity has a positive correlation with distribution performance (r = 0.329). This correlation was found to be significant at the 5% significance level (p-value = 0.015). The relations with government and donors were found to significant and positive to distribution performance of KEMSA with a correlation coefficient of 0.488 which indicates a fairly strong correlation. This relationship was found to be significant at the 5% level of significance (P-value = 0.000). This supports a study by Quelin and Duhamel, (2003) which established that there is a dependency between the relations with government and donors and distribution performance of pharmaceutical products in the public sector. Transportation outsourcing was found to have a statistically significant and fairly strong positive correlation with distribution performance with a correlation coefficient of 0.523 and p-value of 0.000. This was in line with the findings of Quelin and Duhamel, (2003) which also established that there is a positive and significant relationship between transport outsourcing and distribution performance of public sector distribution of pharmaceutical products. Panayides and So, (2005) stated that "proper use of technology ensures inventory accuracies, comprehensive and timely reporting and enhanced feedback in real time." This is in agreement with the study findings which established a strong and positive correlation between information systems and distribution performance. This correlation was found to be statistically significant with a correlation coefficient of r = 0.498 and p-value = 0.000.

5. Summary, Conclusions and Recommendations.

5.1 Summary

The study set out to examine factors affecting distribution performance of KEMSA, with specific focus laid on financial capacity, relations with government and donors, transport outsourcing and information systems. Our findings revealed that financial capacity, relations with government and donors, transportation outsourcing and information systems have implications on distribution performance. Correlation analysis indicate a positive relationship between financial capacity and distribution performance (r = 0.329); relations with government and donors and distribution performance (r = .488); transportation outsourcing and distribution performance (r = 0.523); and information systems distribution performance (r = 0.498)

5.2 Conclusions

This research was aimed at finding out how the four independent variables influence distribution performance at KEMSA. All the four factors namely; information technology, transport outsourcing, relations with government and donors and financial capacity showed great influence to distribution performance. Whereas all the factors may be interrelated, there is still some that KEMSA can address with definite focus and achieve improved results in its distribution function. For instance, many respondents identified lack of training on the enterprise resource planning system as a cause for the low rating of the system within the respondents. Such training may not require any capital investment since the system is already in place.

5.3 Recommendations

KEMSA needs to invest in training its workforce on the inventory management system. This will ensure that many members of staff will become users, and better outcomes will be realized. This research project did not exhaust all the factors that influence distribution performance at

KEMSA, and therefore there is a need to research further and identify any other factors that impact distribution the same way. Such factors may include; geographical challenges, poor infrastructure, politics, and even legal mandate of KEMSA. These are examples of factors which may or may not have marked influence on distribution performance, and may provide knowledge to scholars wishing to pursue distribution as an area of specialization. It is hoped that KEMSA and indeed the government will find this research project useful in prioritizing its expenditure so that drugs reach all the health facilities in the country.

5.4 Suggestions for Further Studies

Future studies are suggested on the following areas: target specific factors' effect on distribution performance of pharmaceutical products in the public sector. Further studies should also look at other factors which were not considered in this study but might have influence on distribution performance of KEMSA. The same variables can also be tested in the private sector environment.

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