

Factors Affecting Distribution Performance for Pharmaceutical Products in Kenya's Public Sector

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Abstract

This study examines the factors that affect distribution performance of pharmaceutical products in public sector in Kenya. It investigates the effect of financial capacity, transport outsourcing, third party relations and use of information technology on the distribution performance of KEMSA. The study uses sample survey for data collection through stratified random procedure for ensuring representativeness of the sample. Both quantitative and qualitative methods of data analysis are used. Descriptive statistics as well as correlation analysis are used for examining the relationship between variables of interest. The findings indicate that relations with government, donors and transport outsourcing followed by information technology and financial capacity have the greatest influence on distribution performance respectively. The finding of the study implies that information technology, transport outsourcing, relations with government and donors and financial capacity should be given due attention.

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

Introduction

As the study focuses on distribution performance, it will be helpful to consider the distribution system in Kenya. 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 the highly competitive business environment, quality of logistics has assumed great significance; it influences such decisions of firms as the choice of (i) country to locate in, (ii) suppliers to buy from, and/or (iii) consumer markets to enter in. Essentially, high logistics costs coupled with low service quality are a barriers to trade and foreign direct investment (FDI) and consequently to economic growth. Massive investments are being made worldwide with some of the best known investment gurus putting their bet on pharmaceutical 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.

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Changing regulations and legislation in various countries can affect a company's current supply chains (Ceva 2010). Logistics is knowledge-based industry which forms 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).

One key aspect of logistics that has proved of great importance for pharmaceuticals is distribution. Distribution is an important activity in the integrated supply-chain management of pharmaceutical products (USAID, 2008). As logistics management is gaining momentum in other industries, pharmaceutical sector has also realized the importance of logistics as a source of strategic advantage. Pharmaceutical and healthcare companies operate within a highly dynamic market. Several factors relate 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 enhances their responsibility. Their focus is to provide cold chain management for temperature sensitive pharmaceuticals to ensure that the quality and efficacy of the products 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 international sales, 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. Distribution of pharmaceutical products 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 reforms 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 consequence logistics industry in India is worth more than

US\$100 billion. There is 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 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 and managed logistics players (Prabhakarsri 2010).

Distribution of Pharmaceutical Products

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).

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).

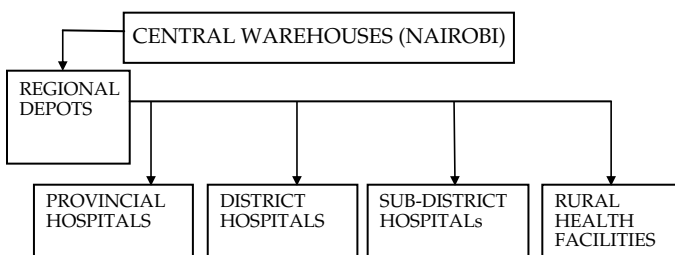


Figure 1: Current KEMSA Distribution Flow

Review of Literature

The review is arranged thematically:

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 geographical areas 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 is the chance 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%. Before 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).

PETS (2008) established that about 25 percent of health facilities experience out of stock key drugs, kits and other commodities; out of stock key medical supplies, contraceptives and non-pharmaceutical items therefore prompted the facilities to engage in direct purchase of the out of stock items. Duration of these out of stock goods averaged one to six months. This could have far reaching implications on service delivery, procurement and process of supplies in the ministry which impacted governance and corruption in the sector (KACC, 2008).

Factors Affecting Distribution Performance of Pharmaceutical

Following factors have been affecting the performance of distribution of pharmaceutical goods in Kenya:

Financial Capacity and Distribution Performance

According to Johnson (2006), performance of a distribution function in the public sector is strongly based 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 which have 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 relevant to distribution systems is the flow of funds. This relates to timeliness of receipt of funds for meeting various requirements in distribution processes.

Signing of agreements with donors or governments can be useful both as a regulatory mechanism and as the means of guaranteeing the timeliness of receipt of funds. 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.

In view of the discussion, the following hypothesis is proposed for testing:

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

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 intensification of global competition, outsourcing has become increasingly popular option which has left few business functions without being wholly or partially outsourced.

Outsourcing has been utilized as a means of reducing costs and maximizing output (Quelin and Duhamel, 2003; Johnson, 2006).

According to Wick (2000), success or failure in distribution depends on care and caution in continuous management of this function to ensure the job being done by distribution partners as 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 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. This leads to the formulation of the following hypothesis for testing:

H2: Transport outsourcing and distribution performance are positively related.

Information Systems and Distribution Performance

Use of Information system to manage distribution increases efficiency, predictability and reduce waste in value chains, which has positive impact on all market players (Ceva, 2010). Such tools of information system as cell phone and internet services, radio, and a wide range of digital devices and related tools, including cameras, GIS, a wide range of hand-held computing devices if appropriately used, has a potential of raising efficiency in the following distribution activities: record keeping, monitoring field agent activities, procurement operations, credit and payment tasks, input distribution, measuring productivity, and forecasting (Cooper, 2006). Buyers use a range of management information systems (MIS) from basic spreadsheets of complex software which is used to track resources and facilitates 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). Vehicle routing can also benefit greatly from IT. This is one of the most critical elements in managing the supply chain. Vehicle routing can be applied in various settings and it 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). The following hypothesis is set up to evaluate this function:

H3: Information systems and distribution performance are positively related.

Relations with Government and Donors and Distribution Performance

The importance of building partnerships among donor and government lies in improvement of service delivery (Cadotte and Stern 1979). When the donors work harmoniously with the

host government, they establish a common goal which they can guide in coordinating the use of available resources for effectively moving to achieve the goal. This specifically calls on donors to intensify their efforts to cooperate with the government in distribution of humanitarian supplies 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' government 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, poor relationship between the donor and the government creates conflicts 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), which 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 the emergence of the process of conflict resolution in distribution channels is unclear. But, other studies have shown 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). To take cognizance of the above views, the following hypothesis is formulated:

H4: There exists a positive relation between government and donors and distribution performance.

Model for Evaluating Hypotheses

The theoretical model, shown in Fig. 2 is evolved. Determinants of distribution performance are congregated into four constructs of financial capacity, transport outsourcing, information systems and relations with government and donors. The relationship between these constructs with distribution performance is conceptualized as follows:

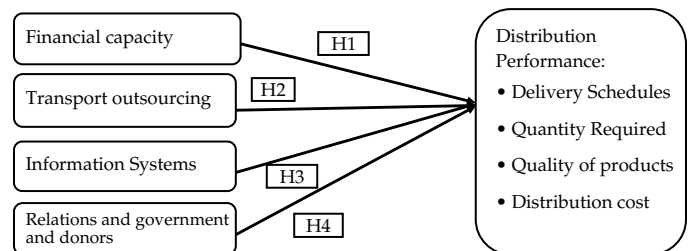


Figure 2: Factors affecting distribution performance (Angelmar, Reinhard and Louis, 1998)

Research Methodology

Research methodology is the package of several components important of which are briefly discussed below.

Research Design

This is a case study of Kenya Medical Supplies Agency (KEMSA). A descriptive research design is used in the study. According to Donald and Pamela (2006), a descriptive study deals with what,

how and who of a phenomenon; these are also the concerns of this study. This research design is appropriate for this study because data required to meet the stated objectives can easily be obtained from questionnaire based sampling.

Sampled Population

Sampled population refers to the total number of individuals bearing the characteristic under examination from which the sample is drawn. It is that group of elements about which some inferences are to be made (Denscombe, 1998). The population of this study is accordingly identified as the management team of KEMSA, that is, 144 members of manpower supervisory level upwards. Study used stratified random sampling technique to select 57 respondents who constitute 40% of the population. The sample is adequate in size and representative in character (Kombo & Tromp, 2006) as it comprise members of all segments of the sampled population.

Instrument and Procedure of Data Collection

A structured questionnaire is used as the main instrument for data collection. The questionnaire was structured to provide answers to both open and closed ended questions that focused on objectives of investigation. The questionnaire comprised various sections. The first section constitutes respondent's general information, while rest of the sections relate to all the main variables. The questionnaire was developed on the basis of hypotheses and was administered by the researcher by hand, courier and e-mail (Kombo and Tromp, 2006).

Data Processing and Analysis

Descriptive statistics summarizes responses to each of the hypothesized factors. This basically includes mean and standard deviation. On the basis of mean, points of consensus on various factors are determined.

Standard deviation is used to estimate the variability of the responses. Pearson correlation coefficient is used to evaluate relationship between the factors postulated as determinant of performance and distribution performance (Panneerselvam, 2005). Correlation analysis is deemed appropriate because the correlation coefficient indicates strength and direction of relationship between distribution performance and the independent variables (Mugenda & Mugenda, 2003). The correlation coefficient ranges between -1 and +1; -1 indicates perfect negative relation, 0 indicates no relation, and +1 indicates perfect positive relation between the variables (Kothari, 2004). Significance of correlation is estimated from value of t at 5% probability level.

Findings of the Study

Results and findings are reported sequentially.

KEMSA Level of Distribution Performance

Apart from delivery of drugs under secure and safe conditions is rated as good by 57% respondents, all other indicators of performance obtained poor scores; 76% respondents felt that KEMSA poorly keeps delivery schedules. An overwhelming majority of 97% felt that vehicle routing and tracking was poor. As high as 81% respondents felt that transport vehicles were insufficient and poorly maintained. Besides, 89% respondents felt that distribution performance monitoring and evaluation

was poor, while 52% respondents considered professionalism as poor in distribution.

Financial Capacity and Distribution Performance

The objective of this facet is to investigate the influence of financial capacity on distribution performance at KEMSA. As many as 96% respondents felt that KEMSA has inadequate finances to effectively discharge its functions. Only 4% felt that its finances are adequate. As high as 91% employee respondents considered financial capacity greatly impacted distribution performance.

The respondents were asked to rate the degree of influence of some financial indicators on distribution; 51% respondents felt that KEMSA faces frequent challenges in meeting its obligations to transporters, while 81% felt that inadequate finances hampered performance evaluation mechanism. But 96% respondents felt that lack of funds led to failure to enhance depot capacity, and 98% felt that funds were inadequate to maintain own fleet of vehicles.

Proportion based analysis is supplemented by more rigorous statistical analysis based on application of Karl Pearson's correlation technique to data. It shows financial capacity to be directly and positively related to distributional performance; value of the correlation coefficient is 0.329 which is statistically significant at 0.05 probability of significance, the probability of finding similar values of the coefficients in repeated sampling to be as low as 0.015 which is much lower than 0.05.

Relations of Distribution Performance with Government and Donors

In order to estimate relation of distribution performance of KEMSA with these twin stakeholders, the respondents were asked to rate the degree of relations of government and donors with distribution performance. About 77% respondents opined that these variables are closely related; 11% averred that relation of KEMSA with government and donors is quite moderate, while other 11% viewed this relation to be small and low.

In response to the suggestion to quantify the degree of this relation, 79% respondents thought 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 which amounts interfering in KEMSA's schedules; 91% trust that there is frequent uncoordinated interference by donors in purchase of short lifespan drugs. About 98% felt that the ministry often monitors specific drugs it purchases, leaving no autonomy of scheduling to KEMSA.

These inferences are corroborated by the value of correlation coefficient between government and donors and performance which has high value as 0.488; this indicates a fairly strong relation. The coefficient is significant at 0.05 probability level of significance, calculated value of the probability is almost zero.

Transport Outsourcing and Distribution Performance

The first question posed to the respondents relate to their view about the impact of transport outsourcing on performance. As many as 85% respondents thought that outsourcing as currently undertaken by KEMSA is not supportive of good distribution

performance, while 15% thought it indeed supported performance. In response to the suggestion to quantify their response, 78% respondents felt that transport outsourcing does affect distribution performance to a high degree.

The respondents were asked whether they approved the current status of transport arrangement and distribution performance of KEMSA; 63% respondents thought that there was hardly any performance metrics for drivers' which resulted in poor performance; 58% considered the condition of trucks in use were in poor condition, leading to frequent breakdowns. Almost 99% said that tracking is not done for outsourced transportation which accounted for frequent delays in deliveries. Correlation coefficient between outsourced transportation and performance indicated statistically significant and fairly strong positive relation between these two variables, its value being 0.523 with almost 0.000 value of calculated probability.

Information System and Distribution Performance

In response to the question about the relation between information technology and distribution performance 97% viewed it to be directly significant, while 3% indicated that information system has no effect on distribution performance, 93% respondents rated the effect of information technology on distribution performance to be very high, since information technology was not fully used utilized at KEMSA.

In responses to a series of other statements posed to respondents, 67% felt that information technology systems were not in place for sharing; 86% thought that KEMSA did not fully use ICT in distribution functioning. Besides, 95% thought that transport vehicles were not fitted with tracking devices for monitoring; 94% felt that distribution function is not appropriately synchronized with the ordering, procurement and warehousing systems.

These responses furnished a correlation coefficient of 0.498 between information systems and distribution performance. The coefficient is statistically significant with p-value of 0.000.

Conclusions

According to Johnson (2006), the performance of any public sector distribution is strongly dependent on efficient management of finances of the enterprise in question. KEMSA is no exception to this rule. This study confirms this proposition in so far as results of the study show that financial capacity is positively related with distribution performance. The relation with government and donors is also found affecting distribution performance of KEMSA significantly and positively. The finding complements the findings of the study by Quelin and Duhamel, (2003) for distribution performance of pharmaceutical products in the public sector. Outsourcing of transportation is also revealed to have a significant and positive relation with distribution performance. This also follows similar findings by Quelin and Duhamel, (2003). The finding of positive relationship between utilization of information system and distributive performance of KEMSA also corroborates the similar finding by Panayides et al (2005). Effective and proper utilization of technology will ensure inventory accuracy, comprehensive and timely reporting and enhanced feedback in real time.

Recommendations

Though all the determinants of performance of distribution of pharmaceutical products by KEMSA are found to be directly related with performance, yet there are still some factors that have not been incorporated in the study and which KEMSA can address to achieve better results than those currently prevail. For instance, many respondents identified lack of training about the resource planning at the enterprise level as a cause of the low rating of the system by the respondents. Such training may not require any capital investment since the system is already in place. Besides, there is ample scope for improvement in the management of the factors that have been found to account for low performance level of KEMSA currently. It may also be recommended that the plan should be accompanied by a plan of action or implementation of the steps involved in the plan process and there should be an effective concurrent evaluation and monitoring system of performance.

KEMSA needs to invest in training its workforce in inventory management and better outcomes may be realized.

Limitations

This research investigation did not exhaust all the factors that influence distribution performance at KEMSA, and therefore there is a need for further research to identify any other factor that impacts distribution. Such factors may relate to geographical challenges, poor infrastructure, politics, and even legal mandate of KEMSA. The list is illustrative rather than exhaustive.

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