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The Effectiveness of Third Party Logistics Providers in the Public Health Sector

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A thesis presented in partial fulfillment of the requirements for the Degree of Master in International Business in the Harold Pupkewitz Graduate School of Business at the Polytechnic of Namibia

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DECLARATION OF ORIGINAL WORK

I, Hendricus, Christianus, Ralph Beukes declare that this thesis is my own unaided work. Any assistance that I have received has been duly acknowledged in the thesis. It is submitted in partial fulfilment of the requirements for the degree of Master of International Business at the Polytechnic of Namibia. It has not been submitted before for any degree or examination at any institution of Higher Learning

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CERTIFICATION

The undersigned certify that they read and recommended to the School of Business and Management for accepting this research submitted by Hendricus, Christianus, Ralph Beukes in partial fulfillment of the requirements for the degree Master in International Business.

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Abstract

The main function of the Ministry of Health and Social Services (MOHSS) in Namibia is to provide health care services to population of Namibia. A large portion of the budget is usually spent on issues relating to logistics. This Ministry makes use of in-house logistics services. The current trends of many facilities are to make use of Third Party Logistics Providers (3PL's). The main objective of the research is to investigate the possibility of using 3PL's for the provision of logistics services in an attempt to improve healthcare services. This research identified six logistics activities: procurement, transport, warehousing, ordering, inventory and information technology, which form the main aspects of logistics in the MOHSS.

The methodology used was a mixed method whereby data was collected through the survey of literature and the use of a questionnaire. Staff members from three (3) referral hospitals and eight (8) National level directorates from the MOHSS completed the questionnaires. The data obtained was, therefore, both qualitative and quantitative.

The survey results illustrated that the health care system is complex and unique and thus requires a very good logistics system. They further revealed that information technology plays a huge role in a proper logistics setup. Based on the analysis done, a conclusion was made that there are still some areas that need to be improved and some area that are still problematic. Procurement and ordering were identified as logistics activities that have more positive outcomes. The other four activities: 1) Transport, 2) Warehousing, 3) Inventory and 4) Information Technology were identified as areas of concern in which some interventions are necessary. Furthermore, many of these activities are done mainly manually with limited use of Information Technology or computerized systems. These areas were also identified as possible areas for outsourcing.

The key recommendations were fivefold and are summarised as follows: Firstly, 3PL providers can be used to provide logistics activities. Secondly, information technology must form the main basis on which logistics services must be done. Thirdly, the training of officials in the logistics set up is an important aspect that needs attention. Fourthly, logistics strategies need to be developed. Finally, inventory management must get special attention as it is the core activity of the logistics function.

KEYWORDS: Logistics, Third Party Logistics Providers, Procurement, Transport, Warehousing, Ordering, Inventory, Information technology, Supply Chain Management.

1 Chapter 1 Introduction

1.1. Research Background

The Oxford English Dictionary (1999) defines Logistics as the branch of military science having to do with procuring, maintaining and transporting material, personnel and facilities. Management, on the other hand, is defined by Robbins et al. (2001) as "the process of getting things done, effectively and efficiently, through and with other people" (p. 5). In any organization, almost everyone needs something that must come from somewhere and be delivered at a certain time and place. Therefore, it can be argued that the logistics system is essential for many organizations, be they social organizations, profit making entities or public offices. The main function of the Ministry of Health and Social Services (MOHSS, (2010) is to provide health care services to the population of Namibia. Ministry of Finance (National Budget Document, 2012/2013) indicates that 1/2 of the budget allocation was spent on supplies and services. This is approximately N$2 billion that was spent on logistics related activities. The Human Resources aspects also play a pivotal role in Logistics management. In the private sector organizations, professional workers such as Logisticians and Charted Accountants who are highly paid to fulfil the tasks of logistics services are utilised. In contrast, the Public Sector in Namibia uses clerks/administrative officers who are at the lower end of the payment structure. The questions are: 1) How effective and efficient is the Ministry in its logistics activities in order to ensure that the demands of its customers are satisfied? 2) Should the Ministry rather use Third Party Logistic Providers to provide these functions?

1.2. Problem Statement

For any large organization, even those with fairly simple operations: some activities can be quite challenging. Logistics activities are also not without challenges and in most cases, public entities seem not to have the capacity to enforce compliance according to pre-arranged agreements. Even the private sector experiences challenges that can have significant consequences with logistics management. Recently there were complaints with regard the performance of the MOHSS in the media. Health workers (nurses, doctors and other staff) primary function is to provide quality health care services to patients. They are, however, largely dependent on the secondary function, logistics services, to achieve their goals and objectives. The logistics system seems to have various challenges, such as lack of capacity, lack of technology, lack of clear areas of responsibility, conflict between the managers of the contractors and the ministry staff, inefficiency, fraud and corruption. It also seems as if the Ministry does not realize the critical role logistics should play in the provision of services. The current trend in the private sector is to make use of Third Party Logistics Providers (3PL's) as

a logistics practice whenever a need is established (Leon, 2011). Furthermore, in the absence of a well-defined Logistics strategy as well as no common understanding of what is required from logistics activities one could argue that the MOHSS will not be able to achieve its goals and objectives.

1.3. Research Questions

It is the aim of the research to address the following research questions:

1. What is the current status of the Ministry's logistics activities and can Third Party Logistics Providers (3PL's) be used in the logistics operations of the Ministry of Health and Social Services?
2. What is service logistics?
3. What is the best practice in service logistics?
4. What are the benefits/costs of using 3PL's compared with in-house service logistics?
5. What is the best practice for service delivery in health services?
6. What is the role of MOHSS in Namibia?

1.4. Research Objectives

It is anticipated that if in-house healthcare services are not done according to best practices they affect the effectiveness of Health Care Service Provision in the Public Sector. Some researchers have established the reasons why some health systems are failing. These include: lack of resources and capacity. Although logistic services, as well as outsourcing, seem to be relative known terms in the provision of services, not much research has been done on the use of 3PL's in logistic health care services in Namibia. The literature reviewed addressed the concepts of logistics services and use of 3PLs. The literature review also provides best practices and processes in logistics and healthcare logistics that can be used as possible solutions for current challenges.

In many parts of the world much has been investigated about various aspects of Supply chain, logistics services and the use of 3PLs. However, the available information indicates that not much research has been done in this area in Namibia. There are some studies which have been done on aspects of logistics in Africa. These provide an opportunity to review the available literature about logistics, supply chain, some general problems in the logistics channel, logistics practices,

processes, strategies, as well as the concept of 3PL as one of logistics optimization techniques. The objectives of the current study are:

a) To review theoretical literature to explain the following:
   i. What service logistic is?
   ii. What is the best practice in logistic services;
   iii. What are the benefits/costs of using 3PL's and in-house service logistics?
   iv. What is the best practice for service delivery in the health sector;
   v. What's the role of MOHSS in Namibia;
b) To investigate what the status of logistics and its activities and whether 3PL providers can be used in the operations of the MOHSS.
c) To identify areas for improvement and provide policy recommendations.

1.5. Motivation for Study

Logistics services with its activities form a very crucial component of any organization. This research is relevant and worth undertaking as no research has been done on the use of 3PLs' to improve the effectiveness of the Ministry of Health and Social Services in Namibia.

1.6. Research Methodology

This research methodology is discussed under Chapter 3.

1.7. Delineation of research

There are three main aspects which stand out in modern logistics service and supply chain management, namely, integration of processes, and collaboration among participants and partnering among the parties involved (Skekhar & Naik, 2004). The literature reviewed gave an indication that in logistics services there are at least three parties involved, while the supply chain in the healthcare sector have at least four parties involved, namely the supplier, the purchaser, the provider, and the patient (client) (Burns 2002).

1.8. Thesis outline

The thesis is divided into six sections: Chapter one provides an introduction to the problem, and also gives an overview of the problem statement. It provides information about the research objectives and the research questions. Chapter two articulates the literature review based on the research sub questions. Chapter three discusses the research design and methodology used to conduct the research. This chapter, furthermore, explains the nature of the study, the population and sampling procedures, research instruments and methodology of collecting data. Chapter four discusses the research results. Chapter five provides a discussion and analysis of the results. Chapter six ends the research and provides conclusions and recommendations and areas for future research.

2 Chapter 2 Literature Review

2.1 Introduction

Third Party Logistics (3PL), also called logistics outsourcing or contract logistics continue to be one of the most misunderstood terms in logistics and supply chain management (Murphy & Wood, 2008). They state that there is no commonly accepted definition of 3PL. Some definitions take a broad perspective by suggesting that any logistics activity not performed in the house is representative of 3PL (Murphy & Wood, 2008). Murphy and Wood (2008) continued to argue that in contrast, other definitions of 3PL arrangements involve a long–term perspective between buyer and seller and that the parties have a relationship. According to Delfman et al. (2003) a Logistics Provider (LP) is a provider of logistics services that perform all or part of a client's company logistics function. The Ministry of Health and Social Services makes use of in-house logistics services, starting from procurement, ordering, warehousing (storage), transportation, inventory control (asset management), and information systems. According to VanVactor (2011) the non-availability of supplies will have an influence on health care operations. The perception might be that health workers are failing to provide services as they are the closest to patients and ultimately responsible for the failure of the Ministry. It can then also be concluded that the failure on the part of any logistics activities may have an influence on the operations of an organization.

2.2 Literature Review

The following sub questions are addressed in the literature review:

2.2.1 What is service logistics?

Waters (2010) suggests "an argument that is being heard more and more frequently is that logistics is a core capability that enables the firm to gain and maintain competitive advantage" (p. 3).

Murphy and Wood (2008) indicated that in order to reduce misunderstandings about logistics that the term logistics should be used according to the Council of Supply Chain Management Professionals (SSCMP) definition. They defined Logistics as that part of Supply Chain Management (SCM) that plans, implements and controls the efficient, forward and reverse flow and storage of goods and services and related information between the point of origin and the point of consumption in order to meet customer's requirements" (Murphy &

Wood 2008 p. 34). This definition is broken into the various key components to get a better understanding of the definition of logistics:

- **Supply Chain Management: -** The full benefits of logistics concept can be realized by extending the logic of logistics upstream to suppliers and downstream to consumers, and this is the concept of Supply Chain Management (SCM) according to Waters (2010). The supply chain concept has originated in logistics literature (Mentzer et al., 2001). A supply chain "encompasses all activities associated with the flow and transformation of goods from the raw material stage, through to the end user, as well as the associated information flows" (Murphy & Wood, 2008, p. 34). On the other hand, Supply Chain Management according to the Council of Supply Chain Management Professionals "encompasses the planning and management of all the activities involved in sourcing and procurement, conversion and all Logistics Management activities. Additionally, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers." Murphy and Wood (2008) further stated that there are twelve (12) activities in the Logistics channel and the most common ones are:
  1. Procurement,
  2. Transportation,
  3. Warehousing,
  4. Inventory management,
  5. Order processing,
  6. Information systems
  7. Value added activities.

  M. Wang et al. (2008) stated that a supply chain is considered as a network of entities and their related activities that work together to produce value for customers.
- **Planning** is defined by Robbins & Decenzo (2001) as "the component which encompasses the definition of an organization's goals, establishing an overall strategy for achieving those goals, and developing a comprehensive hierarchy of plans to integrate and coordinate activities" (p. 6).
- **Implement** in this context can be the procurement/purchasing and distribution activities in the logistics function. Knudsen (1999) stated that procurement includes all activities required in order to get the product from the supplier to its final

destination, whereas purchasing covers all activities for which the company receives an invoice from outside parties. According to the Tender Board Act (Ministry of Finance, 1996) all activities related to procurement are the domain of the Tender Board. However, once approval has been obtained from the Tender Board, the execution of activities rest with the Accounting Officers.

- **Exercising Control** is when one exercises control of activities and the people who carry them out in order to ensure that plans succeed (Amstrong 2011, p. 14). He further stated that one's plans have to be protected from the impact of Murphy's two laws: if anything can go wrong, it will, and of the things that cannot go wrong, some will (Amstrong 2011, p. 14). Armstrong (2011) further articulated ten (10) steps to achieve complete control:
  - Plan what you aim to achieve
  - Set appropriate and fair targets, budgets and standards
  - Decide what you want to control
  - Set success criteria (Key Performance Indicators)
  - Decide how you are going to measure performance.
  - Ensure the measurements are as accurate, valid and reliable as possible.
  - Measure regularly what has been achieved.
  - Ensure that those responsible for results measure their own performance or are provided with measurements that enable them to do so.
  - Compare actual achievements as measured with plans and ensure that every other member of your team does the same.
  - Take or initiate action to exploit opportunities revealed by this information or to correct deviations from the plan.
- **Storage of goods (Warehousing) -** Lambert et al. (1998) state that warehousing is defined as that part of a firm's Logistics system that stores products (raw materials, parts, goods-in-process, finished goods) at and between points of origin and point of consumption. Murphy and Wood (2008) stated that warehousing can be provided either as warehouses or distribution centres. The latter is said to emphasize the rapid movement of goods and the former emphasize the storage of goods with the primary purpose to maximize the usage of available space. The management of warehouses became a very cumbersome exercise, especially when dealing with different types and

large quantity inventory items and in order to manage a warehouse efficiently, one needs to know what is in it, and where exactly each item is stored (Connolly 2008). Connolly (2008) further states that this is referred to as inventory, and is established by stock taking. He continued to say that Information Technology (IT) systems have, however, changed the old system of identifying different items, count them and record them on stock taking sheets for later analysis. Connolly (2008) further stated that labelling technologies facilitate automatic product identification, as well as handheld computers with wireless communication systems (label reading) give real-time capability and integrated stock control into wider software systems for efficient resource management. Connolly (2008) concluded that other IT solutions deal with location-finding which keep track of each item in which warehouse it is, and where the item is in the warehouse (row, rack, section and shelf). The key areas of interest have been the warehousing operations and distribution systems. This as a result of that warehouses and distribution centres operations are historically one of the most frequently overlooked and inadequately planned corporate functions according to Koster et al. (2006). It can be concluded that through technology and the use of various IT solutions, warehouse operations can be streamlined better.

- **Efficiency and effectiveness-.** Efficiency is defined by Robbins & Decenzo (2001) as "doing the task correctly and refers to the relationship between inputs and outputs" while they further defined effectiveness as "doing the right task" (p. 5). Although the two terms are different, they are, however, interrelated. Roodt et al. (2009) gave excellent examples of these two terms. Firstly, they stated that a hospital is effective when it successfully meets the needs of its clientele. Secondly, they stated that efficiency is when hospital managers achieve higher output from its present staff by reducing the average number of days a patient is confined to a bed or by increasing the number of staff-patient contact per day. Apart from the description or definition of effectiveness and efficiency the issue of measurement of logistics performances is another dimension. Keebler & Durtsche (1999) identified thirty- seven choices for logistics measures and these were classified as either effective measures or efficiency measures. The effectiveness measures were categorized further into two subclasses: a) Involving Trading Partners, b) Internal focus while efficiency measures were categorized into three subclasses: a) Cost, b) Productivity, c) Utilization. If firms do

not measure logistics performance they do not plan performance and, therefore, do not take corrective measures and, therefore, lack control of key activities (Keebler & Durtsche, 1999). They continued to argue that regardless of the approach to establish logistics measurements, the real value comes when the information is acted upon to align the effectiveness and efficiency of logistics process performance to a level that is valued by customers. Table 1 below provides an extraction of these measures:

Table 1
Effectiveness and Efficiency Measures

Effectiveness measures	Efficiency measures
A- Involving Trading partners	**A- Cost**
1. Customer complaints	1) Outbound freight cost
2. On-time delivery	2) Inbound freight cost
3. Order Cycle time	3) Inventory carrying cost
4. Overall customer satisfaction	4) 3rd Party storage cost
5. Invoice accuracy	5) Logistics cost per unit vs. Budget
6. Inquiry response time	6) Cost to serve
7. Perfect order fulfilment	
8. Forecast accuracy	**B- Productivity**
9. Over/short/damage	7) Finish Goods inventory returns
10. Days sales outstanding	8) Order process/labour units
11. Returns and allowances	9) Product units processed per warehouse labour unit
	10) Units processed per time unit
B- Internal Focus	11) Orders processed per time unit
12. Inventory count accuracy	12) Product units processed per transportation unit
13. Out of stock	
14. Back orders	**C- Utilization**
15. Inventory obsolescence	13) Space utilization vs. capacity
16. Incoming material quality	14) Equipment downtime
17. Order fill	15) Equipment Utilization vs. capacity
18. Line item fill	16) Labour Utilization vs. capacity
19. Processing accuracy	
20. Case fill	
21. Cash/cash cycle time	

Source: The data adapted from Keebler and Durtsche, 1999. Retrieved from http://www.logisticsquarterly.com/issues/htll*7-2.

Taking into consideration that public entities are non-profit organizations, therefore it is the view of the researcher that under effectiveness, the items numbered 1-7 and 12-16 are best applied to some public entities.

In addition, Walters (2010) stated that because of the high importance of Logistics and the large amounts of funds involved with regards to the activities in the Logistics Channel, organizations seem to have changed their way of looking at Logistics in order to become more effective or efficient. Walters further states that Logistics Management is essentially an integrative process that seeks to optimize the flows of materials and supplies through the organization and its operations to the customer. Logistics management within the healthcare industry is a specialized genre of expertise, and it contributes largely to the success or failure of quality health care service (VanVactor, 2011). There are, however, various concepts of quality. Quality refers to doing it right the first time (Akinyele, 2007). In a similar way Kahn et al. (2002) indicated that quality expresses the entire process from conformance to specifications. In addition, Wicks et al. (2009) defined quality as the summation of the affective evaluations by each customer on each attitude object that creates customer satisfaction.

- **Customer's requirements (Customer services)** – Roger et al. (2004) defined customer services as the ability of logistics management to satisfy users in terms of time, dependability, communication and convenience. They further stated that these four dimensions are essential components that need to be looked at if the institution intends to keep the customers happy.

  Firstly, the time dimension refers to the fact that that businesses are looking at ways to reduce order cycle times since longer cycle times usually translate into higher inventory requirements.

  Secondly, the dependability dimension refers to the reliability of the services experienced and that this consists of three elements, namely:

  - Consistent order cycles;
  - Safe delivery;
  - And complete delivery.

  Thirdly, the communication dimension states that there should be effective communication at all times between the service provider and the customer. According

to Cser et al. (2000) businesses find themselves needing to effectively utilize the internet in logistical functions, including running a virtual factory. Simple communication procedures such as phone calls and emails can be used when data shared is small and infrequent. However, it becomes more inefficient for a worker to verbally exchange information when information increases (Koonce & Chenhasa, 2002). They stated that then more automatic data sharing needs to be done, and recommended two approaches, which are: Electronic Data Interchange (EDI) and data warehousing. The former allows data sharing between partners on structured formats, whereas the latter ensures that all companies are informed by supplying a common data schema access to all data partners.

The fourth and final dimension is convenience of customer services which according to Roger et al. (2004) was to focus on the ease of doing business with the customer. They concluded that different customers have different needs and requirements and to provide customer services this must be remembered all the time. The long term success of the organization according to McColl- Kennedy and Schiender (2000) is the existence of customer's satisfaction. Mansor (2010) further states that companies have been trying since the 1970s to measure customer satisfaction. He further stated that the provision of service is not the same as manufacturing and selling when it comes to customer satisfaction. It can be concluded that a customer is one of the most important parts of any organization, whether it is public, private, profit making or non-profit making.

The Logistics Setup

Aldin and Stahre (2003) indicated that there are three distinct components in a logistic setup: 1) Logistics structure, 2) Information and reporting systems and 3) Logistics processes and related activities. This was illustrated in figure 1 below. These three components have formed the basis of their conceptual model for logistics supply chain management, with special focus on 3PL. They further articulated that all the three components are essential for successful 3PL operations. They argued that: 1) The logistics structure includes the participants in the logistics processes, inventory storage points, multi-echelon distribution centres and warehouses; 2) Logistics processes and related comprise order fulfilment processes, procurement and demand management, customer relationship management and customer services; and 3) that information and reporting systems are essential for any

management system, as they drive the decisions based on data collected. In conclusion, they explained that the Information and reporting systems include the designing and planning of information systems, control and coordination, and cross-organizational coordination. Internet communication technologies such as the intranet, extranet, World Wide Web (WWW) and Electronic Data Interchange (EDI) facilitate the integration of activities in logistics.

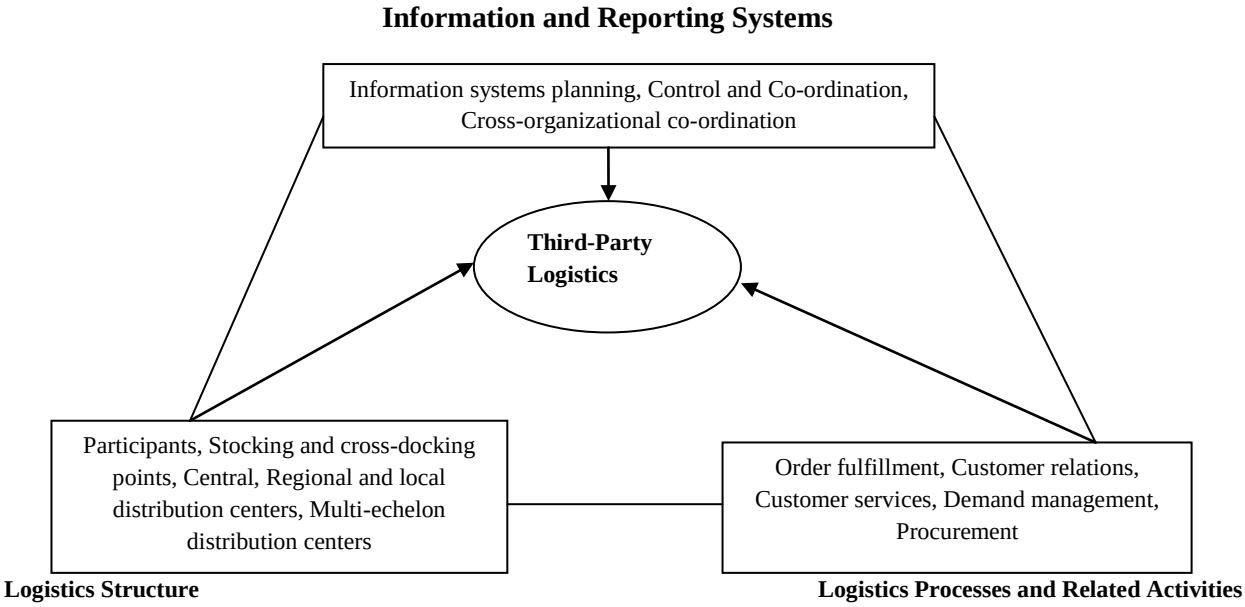

Figure 1. **A conceptual model for logistics supply chain management.**

Source: Aldin and Stahre (2003)

As argued by Aldin and Stahre (2003) that these three components are essential and necessary for 3PL to be successful. The same argument can, therefore, be used and made applicable to in-house logistics units.

Conclusion

It can be concluded that Logistics management is the governance of the supply chain functions. The logistics management activities include transportation management (inbound and outbound), fleet management, order fulfilment, materials handling, warehousing, inventory management, logistics network design, and management of third party logistics service providers. It also includes customer services, sourcing and procurement, production planning and scheduling, packing and assembly. In Healthcare Logistics services there are at least four parties involved, namely the supplier (manufacturer), the purchaser (logistics unit), the service provider (medical staff) and the customer (client/patient) with the supply of goods

and services. In the event of a supply chain valued added activities will be included in the provision of logistics services. Generally, problems that arise in logistics services are: 1) delayed and inaccurate information, 2) Incomplete services, 3) Inefficient and slow operations, and 4) Lack of capacity and resources. It can also be concluded that 3PL performs logistic services on behalf of another institution/company that experience either one or all of the above mentioned problems. In addition, logistics activities need to be measured and acted upon while the three components 1) Logistics structure, 2) Information and reporting systems and 3) Logistics processes and related activities as determined by Aldin & Stahre (2003) are necessary. In the final analysis, Logistics Management is part of all levels of planning and execution, strategic, tactical and operational activities.

2.2.2 What is the best practice in service logistics?

Perrin et al. (2007) defined best practices as "doing the right things right" and that this can be developed through benchmarking, learning and skills from a strategic partner. Therefore, the spirit of recognizing and sharing best practice is to learn from each other and re-use information, according to them.

Murphy and Wood (2008) stated that there are twelve (12) activities in the Logistics channel, and the most common ones are procurement, transportation, warehousing, inventory management, order processing, information systems and value added activities. According Hsiao et al. (2006) there are four levels where outsource able logistics activities can be divided into:

- ✓ Level 1: Transportation and warehousing- This is the lowest level where execution activities result in the short term contractual relationship;
- ✓ Level 2: This includes value added activities which are normally performed by the manufacturing industries;
- ✓ Level 3: This is where planning and control activities are outsourced, such as inventory management and transportation management. Logistics service providers give customized logistics solutions and their skills are complementary to that of their partners;
- ✓ Level 4: Here, also planning and controlling activities are outsourced (Van Der Vorst et al., 2007).

According to Xiao et al. (2013) a best practice is to provide integrated logistics management services for customer demand. This Integrated logistics management service concentrates on the coordination of all logistics activities in a system that will simultaneously try to minimize total distribution cost and maintain desired customer service levels. Xiao et al. (2013) further stated that extensive information system support is critical to facilitate decision making and enhance responsiveness to customer requests. Mason-Jones and Towill (1999) stated that some studies revealed that logistics service providers should improve their service efficiency by continued adoption of information or automation technologies in order to fully satisfy the diversifying requirements of customers. In addition, a suggestion was made by Nixon (2001) that in order for logistics service providers to raise the services capabilities they should employ new information technologies. In support of this, Speakman (2002) also proposed that by employing new technologies, logistics providers could increase their performance. Savage (2003) indicated that innovation in logistics technology is a key variable and a means of differentiating between logistics service providers. In addition, it was stated the innovation in logistic can be implemented through technology, knowledge, and relationship networks (Sauvage, 2003). Sauvage concluded that research revealed that there are already sophisticated Information Technology Systems available on the markets which can be used. The following are examples:

- ✓ Automatic picking- programmed retrieval of goods from a warehouse;
- ✓ Order Management-use of electric data interchanges (Edits) information sharing and handling of orders, online booking, quality control, capacity checking, electronic integration and transparency;
- ✓ E-logistics, which is the use of Internet technologies to transfer goods and services;

It can, therefore, be concluded that the general purpose of information systems is to provide information to management in order to make a decision relating to the functions of the organization. Furthermore, the inception of computers and computer technology and the provision and use of automated logistics activities are quite essential. Better technology is also required by the ever increasing level of the demand for quality and integrated systems.

Outsourcing can be regarded as another best practice in logistics because logistics outsourcing has increasingly become a popular alternative to traditional logistics service mode

according to Laarhoven et al. (2000) and Sandor et al. (1999). Supportive activities such as transport services according to Bardi and Tracey (1991) are most likely to be outsourced. There are also strategic activities such as inventory management and logistics information systems that can be outsourced, according to Lieb and Randall (1999), Lieb and Miller (2002) as well as Leahy et al. (1995). This furthers the understanding that outsourcing can be used to improve the delivery of services.

Koh et al. (2007) indicated that Supply Chain Management practices which include logistics can be categorized from the following aspects:

1. Close partnership with suppliers;
2. Close partnership with customers;
3. Just-in-time-supplies;
4. Few suppliers;
5. Strategic planning;
6. Holding safety stock;
7. Subcontracting;
8. E-procurement;
9. Outsourcing and many suppliers

However, according to Chong et al. (2010) the SCM practices are the generally categorized in the following:

1. Supplier relationship management;
2. Customer relationship management;
3. Demand Management;
4. Capacity and resource management;
5. Information and technology management;
6. Service performance;
7. Service supply chain finance;
8. Order process management.

In addition, Ellram, Tate & Billington (2007) identified the following seven theoretical processes in Supply Chain Management:

1. Supplier relationship management;
2. Customer relationship management;
3. Demand management;

4. Capacity and skills management;
5. Information flow;
6. Service delivery management;
7. Cash flows.

The similarities are observed within these practices and processes, identified and articulated by the different researchers mentioned above. In the final analysis, it can be concluded that there are two main best practices: 1) the use of Information Technology as one of the main requirements that will ultimately ensure effectiveness and efficiency in logistics services; 2). the use of 3PL. This is especially relevant when dealing with complex logistics activities. In addition, as earlier stated in paragraph 2.2.1 logistics activities need to be measured and acted upon.

2.2.3 What are the benefits/costs of using 3PL's compared with in-house service logistics?

2.2.3.1 Introduction

According to Murphy and Wood (2008), the decision to use 3PLs could be more tactical in nature than strategic. They further stated that when tactical the organizations usually has an ineffective distribution network, an inability to control internal cost, a costly or inflexible workforce, outdated warehouse facilities, or out-dated information systems. They continued to argue that when the decision is strategic it is driven by the idea that transformation needs to take place. They concluded that there should be recognition that an organization does not have sufficient internal capabilities to address the issues at hand. According to Garcia-Leon (2011) logistics service supply is recognized from four types of logistics operators which were described as follows:

- First Party Logistics Provider (1PL): Is a company that conducts its own logistic activity;
- Second Party Logistics Provider (2PL): is a service provider that does not require highly specialized services and offers transport services and storage;
- Third Party Logistics Provider (3PL): is recognized as an integrated logistics provider, offering a range of value added services apart from transport and storage, can meet maintenance activities, inventory control, customs services, reverse logistics, processing orders, among others:

- Fourth Party Logistics Provider (4PL): is known as the logistics coordinator and is able to carry out international operations in exports and imports, to hire the services of other operators and efficiently manage the logistics from start to finish.

2.2.3.2 Benefits of using 3PL's in-house services logistics

From a business point of view, competition is a must in today's business environment and as a result of this many companies develop logistics and the use of 3PL's as part of their corporate strategy for cost and service advantages according to McGinnis and Kohn, (2002).

A user of 3PL's can reduce capital investment in logistics facilities, reduce inventory, concentrate efforts on core business functions, improve response rates to customers, and reduce logistics cost, according to Crum and Benjamin (1997), which can be seen as benefits. They argued that when the reason is tactical in nature then a decision is made to move from in-house logistic services to outsourcing the benefits range from effective distribution networks, ability to control costs, flexible workforce with lower cost of wages, improved warehouse facilities, improved IT system to ultimately satisfy customers.

The literature review of the benefits of outsourcing usually discusses the cost savings and other non-financial performance effects such as focus on core business:

- Cost savings: - It is argued that cost reduction from logistics outsourcing originates mainly from better capacity utilization (Dabhilkar & Bengtsson, 2008). Van Damme and Van Amstel (1996) stated that the fixed cost becomes variable cost as companies only pay for the services provider's output. Therefore, they argued that the budgeting and allocation of logistics management cost become easier as there is a direct link between the services and the cost involved. This, according to them results in different logistics management strategies which are easier compared because the logistics cost become more explicit. Xiao et al. (2013) indicated that in order for firms to reduce costs and obtain service advantages they have to develop logistics as part the corporate strategy of their business.
- Focus on core competencies: -The outsourcings of logistics which in some cases are non-core activities allow the companies to give more attention to the core function of entities, (Norek & Pohlen, 2001). Companies are able to increase focus on managerial attention and resource allocation to those tasks that it does best, and less attention is paid to train personnel and purchase of equipment according to Jiang et al. (2007).

2.2.3.3 Cost of using 3PL's compared with in-house logistics

The literature above reflects the benefits and reasons why companies can use 3PL's. However, there are also disadvantages when using other parties to do activities that were initially done in-house. Among them are the following:

- Protection of company information: - There are possibilities that the 3PL also works for a competitor and may share information according to Van Damme and Van Amstel (1996). According to them this is because when companies are outsourcing, information has to be shared (this is sometimes sensitive and confidential).
- The risk of losing expertise and innovation capability: - There is a risk that the company will lose the expertise in logistics, which make management more reserved as far as outsourcing is, concerned (Hsiao et al., 2011). Dankbaar (2007) stated that it is relatively easier to change from carrying out to contracting if it is more advantageous to do so.
- Loss of Direct Control-: There is an argument that reliance on outside suppliers is likely to lead to a loss of direct control.

2.2.3.4 Conclusion

There are indeed benefits and costs with regard to the use of 3PL's for the provision of logistical services. However, each organization will have to consider the underlying reasons when decisions have to be made whether logistics service has to be provided by 3PL's or in-house logistics service is to be performed. Indeed, when core functions of the organization are large, complex, unique, and where there is also competition there seems to be a trend that businesses prefer to outsource certain logistics activities. There are many advantages that a company can gain by starting to outsource logistics management to a 3PL. A 3PL can manage distribution, packing, warehousing and assembly. Through their combined resources and knowledge, they can help to maximize profitability. The utilization of a 3PL also gives companies a logistics advantage of reliability. According to Zacharia et al. (2011) the reasons for the institution to outsource or use 3PL's are grounded in the following three theories:

i) Transaction Cost Theory: To minimize cost
ii) Resource Based Theory: To increase access to a wider range of resources
iii) Network Theory: To take advantage of third party relationships

In summary, these advantages were described (Zacharia et al., 2011) as follows:

- **Save Cost and Time:** The use of a 3PL provider eliminates the need to invest in technology, transportation, warehouse space, and staff to carry out the logistics process. A 3PL provider gives a company the ability to benefit from many resources that are not available in-house.
- **Expertise:** **3PLs** always stay current with all of the latest advances in technology, and they are knowledgeable about the best practices in the industry. 3PL software is capable of inventory management, advanced reporting, and it provides the ability to monitor the complete process. The outsourcing of logistics allows the business to focus on all of its core competencies, leaving the experts to deal with the rest.
- **Scalability and Flexibility:** A key advantage of a 3PL provider is their ability to scale transportation, labour and space according to the needs of the institution's inventory. Companies that have seasonal periods can have a stress free transition from ups and downs in the industry. A 3PL provider can set up warehouses and distribution centers in strategic places that allow for faster movement of products to any location in the area.
- **Resource Network:** 3PLs have large networks available that have many advantages over supply chains that are in-house. By using the resource network of a 3PL provider, the steps of a supply chain are able to be executed in a cost effective, efficient way. The ability of a 3PL provider to leverage relationships and volume discounts can result in the fastest service possible and lower overhead.
- **Continuous Optimization:** 3PL providers have the resources to make improvements and adjustments to each link in the supply chain. They will make sure that all of the institutional needs are met by using the most cost effective, efficient and fastest methods available. 3PL providers have the ability to restructure a supply chain. They have technology that makes sure the correct amount of merchandise arrives where and when needed. Advanced management software is able to streamline the supply chain, as well as monitor and analyze inefficiencies. 3PL providers can help improve customer service, reduce waiting times and help maximize profits.

It can therefore be summarized that the main objectives of outsourcing of logistics services are to: 1) Reduce Capital investment, 2) Reduce operating cost and 3) Meet the demand function.

2.2.4 What is the best practice for service delivery in health services?

2.2.4.1 Introduction

The healthcare sector supply chain has at least four parties involved, namely the supplier, the purchaser, the provider, and the patient (Burns 2002). No matter how good or bad health care services in public institutions are, they are usually placed on the shoulders of the provider (health care workers). Logistics services are regarded as a secondary function in the healthcare service provision and they are usually overlooked as an area of concern or as a reason for failure. Logistics service in the business sector has been critically accessed and transformed over the years. Therefore, logistics management and use of Third Party Logistics Providers in Public institutions can play a role in the success or failure of health care service provision (VanVactor, 2011). Healthcare operational cost in Namibia represents approximately N$4, billion, which represents 11% of the National Budget. The material and service cost was approximately N$2, billion (General Ledger 2012/2013). The primary objective of the Ministry of Health and Social Services is to focus on the provision of the best quality of care. As stated by VanVactor (2011), logistics management within the health care industry is a specialized genre of expertise, and it contributes largely to the success or failure of quality health care service.

Bamford et al. (2008) articulated that in order to improve the performance of health – care services, worldwide health care system can 'adopt' and 'adapt' the best practices, tools and process from other industries as long as they have proven to be good. Based on the above, it can be concluded that best practices of supply chain management and logistics management can also be implemented in the health care sector. The areas of importance in the healthcare sector include the following components (Chong et al., 2010):

1. Supplier relationship management;
2. Capacity and resource management;
3. Order process management.
4. Information and technology management;
5. Demand Management;
6. Customer relationship management;
7. Service supply chain finance;
8. Service performance;

2.2.4.2 Best practice in the supply chain in the health sector

Bamford and Chatziasian (2005) stated that in health care, the need to effectively manage services is magnified by the high value placed on delivery by the patient. The primary purpose of the supply chain in the healthcare sector is to obtain supplies and services from the producers and ensure the timely delivery of goods and services to the health workers (VanVactor, 2011). The primary purpose of health service providers is to ensure that the needs of the patients are fulfilled. It is usually the logistics and/or procurement units in hospitals that are responsible for ensuring that the supplies and services are provided to the health service providers.

Based on the aspect of resource management, the importance of disciplined inventory management for hospitals seems to be at the forefront and studies found serious consequences of traditional hospital purchasing. This also includes lack of missed contract compliance, excess inventory levels, lack of inventory control, frequent stock- outs and costly emergency deliveries, expensive rework, workflow interruptions, and increased health system labour requirements. Langabeer (2005) there are few hospitals that utilize inventory optimization techniques in order to improve inventory practices (demand forecasting and replenishment planning). The recommendation was to redesign the procurement processes.

These processes include the following elements:

1. **Information Technology (IT):** The importance of IT and e-commerce strategies were documented by More and McGrath (2002). In reducing cost the effective utilization of IT plays a critical role within the healthcare supply chain on inventory management, which indicated that hospitals hold the usual high level of safety stock, as a result of using poorly implemented inventory management techniques and personal judgment when determining safety stock levels. The recommendation was to use more scientific approaches. There are already various automated replenishment programs in the market which can be used for inventory management. The Vendor Management Inventory (VMI) software was recommended by Haavik (2000). This system will help to eliminate overstocking cost in the hospital supply chain. The system basically puts the responsibility of ordering on the distributor. VMI improves the procurement processes as well as inventory control of pharmaceutical products in hospitals (Haavik, 2000). There was also an indication that the distributors can obtain more timely and accurate data regarding inventory usage and status of hospitals according

to Haavik (2000). This leads to more accurate demand forecasts and enabling the product to be supplied on and cost effectively. Another invention was designed and developed by Kim (2005) which is an integrated supply chain management system for optimizing inventory control and reducing material handling cost for pharmaceuticals through an online procurement system. It was Smith and Flanegin (2004) that stated there is a potential for savings through the use of e-procurement in the health sector. It was also indicated that the e-procurement can help to reduce purchasing cost through the consolidation of supplier networks and creation supplier partnership. They further stated that the use of enterprise planning (ERP) systems can reduce administration and transactions cost. An automated and paperless format is provided for information flow throughout an organization when using ERP systems.

2. **Standardization:** Financial and clinical benefits in the healthcare service sector derive from the aspect of product standardization as discussed by Wagner (2006). These benefits include the following:
   a) Increased efficiency in the store room by reducing the Stock Keeping Units of similar items;
   b) Improved ordering methods by reducing active Stock keeping units in the item master file;
   c) And increased opportunities for better pricing due to increase the volume of particular products
3. **Contract compliance:** Popiolek (2006) argued that it is important to maximize contract coverage, improve contract compliance and streamline the purchase processes.
4. **Education of supply chain practices:** The job classification title "Logistician" does not exist in the job classification of the public sector in Namibia. Fawcett and Magnan (2001) stated that education and training in supply chain management are key factors for implementation success which, ultimately, will improve the service delivery in health care.

2.2.4.3 Conclusion

Based on the literature reviewed it can be concluded that best practices recommended and implemented in other sectors can also be implemented in the healthcare logistics services. It was earlier summarized that the best logistics practices are twofold: 1) the use of

Information Technology as one of the main requirements that will ultimately ensure effectiveness and efficiency in logistics services, and 2) the use of 3PL. Furthermore, Information Technology systems and logistics seem to have a close link. This is especially observed when complex logistics tasks and processes such as stock replenishment and order management have to be fulfilled efficiently and effectively. In addition, logistics activities need to be measured and acted upon.

The health care system is also complex and unique; therefore, it needs a very effective logistics system that supports the healthcare system. The purpose of Information Technology is therefore the basis on which the logistics activities must be supervised.

2.2.5 What is the role of MOHSS in Namibia?

2.2.5.1 Roles and Responsibilities

The Namibian Constitution, clearly outline the roles and duties of the State in the Republic of Namibia. Article 95, of the Act no1 of 1990 deals with the Promotion of the Welfare of the People. Article 95, subsection (j) stated "consistent planning to produce and maintain an acceptable level of nutrition and standard of living for the Namibian people and to improve health"

2.2.5.2 National Health Policy Framework

The Ministry developed a National Health Policy Framework 2010-2020 that was launched in July 2010 (website http://www.healthnet.org.na) document. This document clearly stipulated the following vision, mission and policy goal:

- ✓ Vision- "A healthy nation, which is free of diseases, poverty and inequality"
- ✓ Mission- "The MoHSS to provide a determined leadership to make health and social welfare services effective, and efficient; to facilitate conditions for organizing communities, households and individuals to take control of their health and to liaise with other sectors and partners driven by a shared commitment to the health of the nation"
- ✓ Policy Goal- "Health and social well-being are fundament human rights. Consequently, the ultimate goal of the Government of Namibia and the Ministry of Health and Social Services is the attainment of health and social well-being by all Namibians, which will enable them to lead economically and socially productive lives. This will be achieved through using a cost-effective developmental social welfare and Primary Health Care approach, which includes promotion prevention, curative and rehabilitative services in collaboration with other sectors, communities, individuals and partners."

2.2.5.3 Organizational Structure of the Ministry

The current organizational structure makes provision for the Offices of the Minister and Deputy Minister who are assisted by two special advisors. The offices of the Permanent Secretary and the Deputy Permanent Secretaries have three Departments that coordinate and facilitate the activities and functions of the entire workforce of the Ministry. The approved staff establishment of the Ministry is 11894 as at 31 December 2012. The three departments are assisted by eight (8) National Directorates and thirteen (13) Regional Directorates. The thirteen regional directorates are the representatives of the thirteen political regions. Within these regions there are thirty five (35) hospitals.

2.2.5.4 Functional Areas of the Ministry

The Ministry of Health and Social Services was established on 21st of March 1990, and its role is to provide quality health and social welfare services to all Namibians. There are currently 35 hospitals, 69 Health centres, 269 clinics, more than a 1000 outreach points that provide public health care services. The functional areas are supported through functional programs that are implemented across the Ministry.

2.2.5.5 Functional Programs of the Ministry

The following seven programs have been developed in order to budget and execute the functions of the ministry which are reflected in the Medium Term Expenditure Framework document (2013-2016):

Program 1: Health Systems Planning and Management

This program intends to develop the capacity for planning and management of health and social services in order to optimally and efficiently utilize the available resources dedicated to the sector. Particular attention is to be given to planning in the following health system areas: HRH, health financing, service delivery (logistics activities included), governance, HIMS, PPP and healthcare technology and pharmaceuticals. The Ministry of Health and Social Services makes use of in-house logistics services, starting from procurement, ordering, warehousing (storage), transportation, inventory control (asset management), and information systems..

The main activities of this program include the following:

- ✓ Administration (Remuneration);
- ✓ Policy Planning;
- ✓ Information Technology and Research;

- ✓ Vehicle Fleet Management;
- ✓ HR Planning & Development;
- ✓ Infrastructure development;
- ✓ Facilities Management Services:
- ✓ Support to institutions (WHO, SADC, Mission Hospitals);

Program 2: Disability Prevention and Rehabilitation

The main aim of this program is to contribute to the prevention and rehabilitation of disability in the country.

The main activities of this program include:

- ✓ Blindness and deafness prevention;
- ✓ Mental health;
- ✓ Community based rehabilitation;
- ✓ Medical rehabilitation and institutional;
- ✓ Orthopaedic Technical services.
- ✓

Program 3: Environmental Health

The objective of this program is to develop policies, measures, programs and standards to ensure prevention of health hazards and diseases emanating from the environmental management.

The main activities of this program include:

- ✓ Public Hygiene services;
- ✓ Food quality assurance;
- ✓ Waste management;
- ✓ Occupational health services;
- ✓ Radiation protection;

Program 4: Control of Communicable and None-Communicable Diseases

This program aims to establish and improve capacity and systems for disease surveillance, analysis, databases and control measures. The program includes the study of the distribution and patterns of health events, health characteristics, causes or influence in well-defined populations.

The main activities of this program include:

- ✓ HIV/AIDS;

- ✓ TB and Leprosy;
- ✓ Malaria;
- ✓ Non-communicable diseases;

Program 5: Family Health Services

This program's main objective is to improve and protect the health and nutrition of families and communities through specific interventions that reduce maternal, infant and child mortality, morbidity and malnutrition.

The main activities of this program include:

- ✓ Outreach Services;
- ✓ School health and adolescent health services;
- ✓ Food and nutrition;
- ✓ Reproductive health;
- ✓ Health promotion.

Program 6: Clinical and Health Care Services

This program aims to provide a broad range of interventions to deliver services for inpatient and outpatient health care services to match the need of the communities. Inpatient services include, amongst others, medical, surgical, paediatrics, obstetrics, orthopaedics, Ear, Nose and Throat, etc. Outpatient services include, amongst others emergency services, day procedures, diagnostic and assessment services, therapy services.

The main activities of this program include:

- ✓ Specialized health services;
- ✓ Supply of other pharmaceuticals;
- ✓ Medical related supplies;
- ✓ Medical equipment;
- ✓ Pathology Services;
- ✓ Blood Transfusion Service;
- ✓ Hospitality Services.

Program 7: Developmental Social Welfare

The program aims to ensure quality delivery of social care that provides care equally for all while enabling people to retain their independence, control and dignity. This program includes activities such as support of people with disabilities, promotion of family well-being, counselling, administering policies and legislations for registration and operations of welfare organizations

and institutional centres, offender health, mental capacity, learning disabilities, assistance to people affected by the abuse of drugs/substance.

The main activities of this program include:

- ✓ Family welfare;
- ✓ Substance abuse prevention and drug control;
- ✓ Statutory, residential and institutional care;

Taking into consideration the above mentioned programs and activities it can be concluded that the public healthcare services in Namibia are large, unique and complex. This, therefore, requires a well organised support system in order to be effective and efficient.

2.2.5.6 Namibia's Fourth National Development Plan

Five year National Development Plans are drawn up by the Government of the Republic of Namibia, encompassing the key goals, and strategies for the country in the next five years. In July 2012, the Fourth National Development Plan (NDP 4) was launched. This National Plan has four sections, and section two (2) includes the provision of health care services.

2.2.6 Theoretical Framework

Healthcare logistics is seen as unique and more complex, and opportunities for improvements can be considered. The research concentrated on the subjective experience of those staff members at operational, supervisory and management level dealing with the logistic activities at the Katutura Hospital, Rundu Hospital and Windhoek Central Hospital as well as at the head office. In the provision of health care services, there are four parties involved with regards to the activities in the logistics channel. The four parties involved are the supplier, the logistics unit, the health care provider, and the patient/client. The following figure 2 explains the interconnections between the parties:

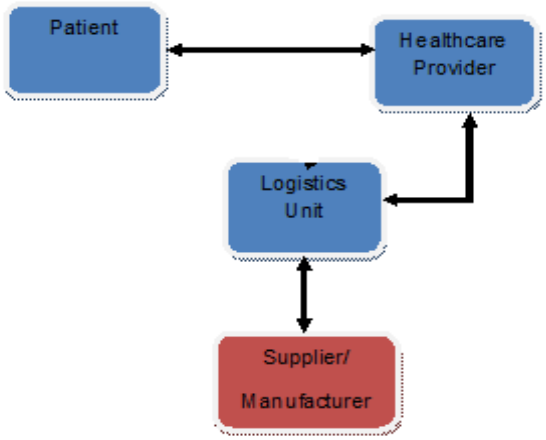

Figure 2. **Logistic parties in Health Care Services:**

The Logistic Unit (LU), the provider and the patient are within the healthcare institutions, and the LU is central in the operations of the supply chain. Each one of these parties has different roles to fulfil in this supply chain. The healthcare sector primarily focuses on the provision of quality healthcare services to patients. The logistics unit is the link between the supplier and the service provider. The latter is the link between the Logistic Unit and the patient. The Logistic Unit can be seen as a strategic and important support function of healthcare systems. Therefore, the effective and efficientoperations of logistic units have an influence on the operations of the healthcare systems. Murphy & Wood (2008) indicated that there are twelve logistics activities, however only six of those activities are currently employed by the MOHSS in its logistics channel. The Logistics Unit performs these activities and which are related to procurement, ordering, warehousing , transportation, inventory control, and information systems. Taking into consideration that the Public Health Service in Namibia is also be regarded as large, unique and complex and requires well-organized logistics strategies to achieve its goals and objectives.

The literature review has provided useful information on the best practices in logistics and healthcare logistics. In order to address the main research question a conceptual framework was developed based on the literature review. The following figure 3 reflects the conceptual framework:

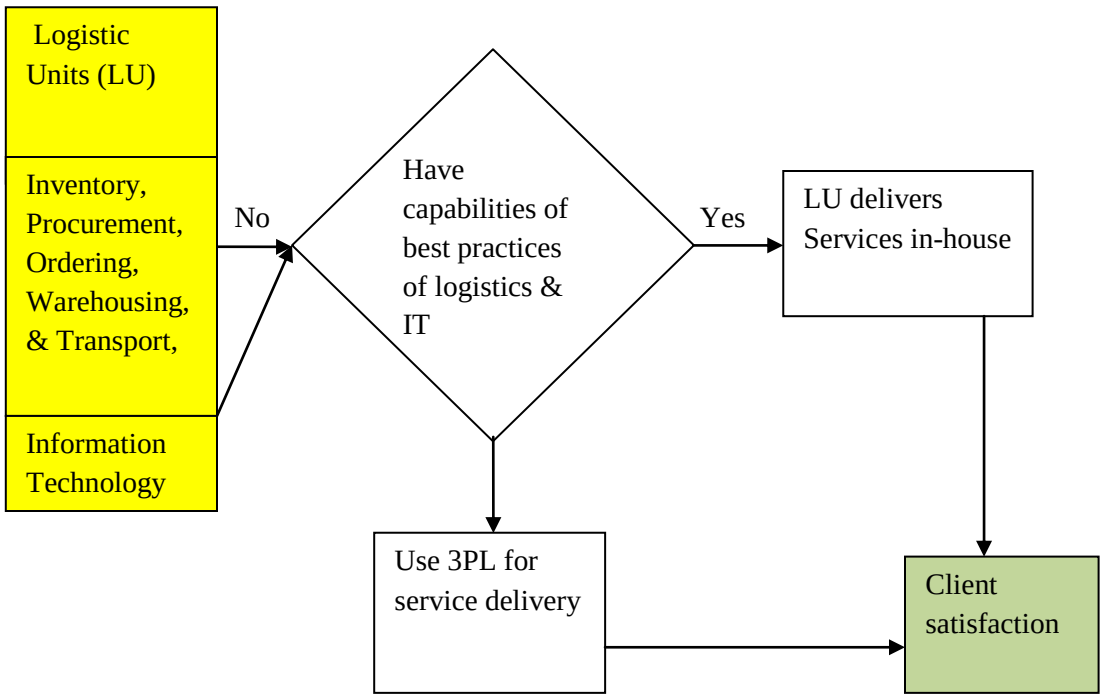

Figure 3. **The Conceptual Framework.**

The first component, the Logistic Unit (LU) represents the logistics activities taking place. This LU performs the five logistics activities, namely; inventory management, procurement management, ordering management, warehousing management, transportation management while the sixth, Information Technology, forms the link between these activities. The second component is with regards to the capacities in best logistics practices, IT capabilities and willingness to outsource some of the logistics activities. The purpose of this framework is to determine the status of the in-house logistics activities including IT.

This framework has the objective to investigate the status of the current operations of the logistics units. Firstly, secondary data will be collected through documents reviewed. Secondly, quantitative as well as qualitative data will be gathered through a survey questionnaire. It is anticipated that this framework will give a direction, as to whether logistics activities should be done in-house or to be done by 3PL providers, in an effort to improve the effectiveness of logistics services in the health care system.

Furthermore, as shown in literature review the reasons for making a decision whether to use another party to provide the logistics services can either be strategic or tactical. It can be concluded that if the decision is strategic in most cases it is about efficiency, and when tactical it is about effectiveness. Thus, the research will look at the results in relation to the following four areas:

1. Best logistics (Supply Chain) practices implementation in six logistics activities;
    - Skills and Knowledge of Logistics/Supply Chain Management processes;
    - Integration;
    - Client Services.
2. Logistics Planning and Control;
    - Inventory planning and Control (warehousing)
    - Procurement planning and Control
    - Coordination
3. Technology capacity and usage.
    - Communication within the supply chain;
    - Use of information systems for data collection (decision making);
    - Infrastructure
    - Skills and knowledge of IT and automated Systems
4. Other General Observations
    - Willingness to outsource logistics services
    - Participants information

The researcher intended to examine the current practices of the three hospitals and the head office directorates with regards to Logistics and the selected activities.

2.2.7 Summary

There was one main research question that was designed to appraise what the current status of the six main logistics activities are and whether 3PL's may be used in the provision of healthcare logistics. In addition, five sub questions were also designed. The literature reviewed in relation to the five sub questions revealed the areas that have an influence on the provision of logistics and healthcare logistics service delivery and possible constraints which may affect the operations of logistic functions in the MOHSS (Khomas, and Kavango-East Regions). The literature reviewed provided useful information in relation to the five sub questions. This in relation to what logistics service is as well as the functions and roles of the

Ministry of Health and Social Services. It further discussed what benefits and disadvantages can be realized with the use of Third Party Logistics Providers. The issues of best practices of Service Logistics as well as best practices of Health Care Services were also discussed under the literature review.

Logistics service plays a pivotal role in the operations of any organisation, be it a public, private or social organisation. The reasons for using third parties can either be tactical or strategic in nature, but generally it is the inability of the organization to provide effective and efficient services to its customers. These are based on three theories 1), Transaction Cost Theory, 2), Resource Based Theory and 3), Network Theory. It is clear from the literature reviewed that there are many organizations that use various reasons to engage third parties to provide logistics services. The health care system is dynamic and complex and has various role players that contribute to the provision of health care services.

The Literature identified four main role players in the supply chain of health care services who are the supplier, the logistic unit, the health service provider, and the patient/client.

In addition, six main activities have been identified for the logistics units in the healthcare supply chain. These are inventory, procurement, ordering, warehousing, transportation, and information technology. The scope of the research was narrowed into these six logistics activities. There are indeed twelve activities in the logistics channel, and the six selected are the most recognized in the public health sector, particularly in Namibia. For other service providers, other activities can also be selected. The literature review also showed that in a logistics setup, the following three components should be in existence: 1) Logistics structure, 2) Information and reporting systems and 3) Logistics processes and related activities.

In the analysis of the literature it was clear that best practices in logistics implemented in other businesses can also be implemented in the healthcare logistics services. This was with regards to best practices in logistics which can be implemented in the healthcare supply chain, particularly with regards to the use of Information Technology.

Seven (7) areas of best practices have been identified in the literature reviewed and are the following:

- ✓ The innovation in logistics technology;
- ✓ Extensive information system support;

- ✓ Integrated logistics management services for customer demand;
- ✓ Continues adoption of information or automation technologies;
- ✓ Knowledge and relationship networks;
- ✓ Disciplined inventory management for hospitals through the utilization of inventory optimization techniques; and
- ✓ Redesign the procurement processes through standardization, contract compliance, information technology system, and training of the users with supply chain practices.

It can therefore be concluded that the literature review provided direction and clarity to all the five sub questions. In addition, it gave direction to the main activities to be concentrated on in the research that should lead to the answering of the main research question, using the RBV theory as the underlying basis. Earlier research on RBV emphasised the importance of resources and their implications for the firm's performance. The investigation of the targeted samples and activities will be evaluated based on the four main areas and in addition to the current status. The conceptual framework (paragraph 2.3: Figure 3) was designed based on the literature reviewed and an attempt was made to develop a framework. It is, therefore, anticipated that the data analysis of the questionnaires and of the documents reviewed will reveal whether or not the three hospitals and the head office directorates are using best practices in the provision of logistics services.

3 Chapter 3 Research Methodology

3.1 Introduction

This chapter reflects on the research design and methodology, different types of researches and the method used in this research. It also reflects on the research questionnaire, rresearch strategies, data collection instruments, and data processing methods. Finally, it also discusses the ethical consideration and gives a summary at the end of the chapter**.**

3.2 Research Questions

The overall objective was proposed to investigate whether 3PL providers can be used in the logistics operations of the MOHSS. The research intended to determine the current status of the logistics activities in the health care system in Namibia. The research questions were linked to the research objectives. The specific objectives of this research were to achieve the following goals:

1. The first goal was to review the literature to explain the following sub research questions:
   a) What service logistic is?
   b) What is the best practice in logistic services;
   c) What is the best practice for service delivery in the health sector;
   d) What are the costs/benefits of using 3PL's compared with in-house service logistics?
   e) What is the role of MOHSS in Namibia;
2. The second goal was in relation to the main research question and was to investigate what the status of logistics units are and whether 3PL providers can be used in the logistics operations of the MOHSS;
3. The third and final goal was to identify areas for improvement as well as to provide recommendations.

3.3 Research Strategy

According to Creswell (2003) there are basically three research approaches, namely; 1) Quantitative; 2) Qualitative and; 3) Mixed methods.

It was also suggested that the following three framework elements need to be considered:

i. Philosophical assumptions about what constitutes knowledge claims;
ii. General procedures or research called strategies of inquiry, and

iii. Detailed procedures of data collection, analysis, and writing methods.

It is argued that each of the quantitative, qualitative and mixed methods form these elements differently. Creswell (2003) defined these three methods as indicated hereunder:

1) Qualitative Method

Is one in which the researcher often makes knowledge claims based primarily on constructivist perspective (i.e., the multiple meanings of individual experiences, meanings, socially and historically constructed, with an intent of developing a theory or a pattern) or advocacy or participatory perspectives (i.e., political, issue oriented, collaborative, or change oriented) or both. It also uses strategies of inquiry such as narratives, phenomenology's, ethnographies, grounded theory studies, or case studies. The researcher collects open-ended, new data with the primary intent of developing themes from the data. This type of research is fundamentally interpretive and therefore it's the interpreter that makes an interpretation of the data.

2) Quantitative Method

Is one in which the investigator, primarily uses post positivist claims for developing knowledge employs strategies of inquiry such as experiments and surveys and collects data on predetermined instruments that yield statistical data.

3) Mixed Method

The mixed method is one which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence oriented, problem-centred, and pluralistic)? It employs strategies of inquiry that involve simultaneous or sequential data entry to best understand the research problems. Data collection also involves gathering numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that the final database represents both quantitative and qualitative information.

The strategies used for qualitative methods of Research are the following according Croswell (2003):

- ✓ Ethnographies: -the researcher studies an intact cultural group in a natural setting over a prolonged period of time by collecting, primarily observational data;
- ✓ Grounded theory: the researcher attempts to derive a general abstract theory of a process, action, or interaction grounded in the views of participants in a study;
- ✓ Case studies: - the researcher explores in depth a program, an event, an activity, a process, or one or more individuals;

- ✓ Phenomenological research: - the researcher identifies the "essence" of human experiences concerning a phenomenon as described by the participants in a study; and,
- ✓ Narrative research: - in the form of inquiry in which the researcher studies the lives of individuals and asks one or more individuals to provide stories about their lives.

In order to get a general idea of how the current logistics activities in the health care system are operating through the eyes of the individuals dealing with those activities, the use of the case study is the best that can be done. The current status of the processes, actions and capacity within the supply chain of the health care system provided useful information as whether the current in house logistics service were using best practices. If not then they should use of 3PL's in order to improve the delivery of health care services. This was with regards to the logistics activities of 1), procurement, 2) order processing, 3), warehousing, 4), inventory management, 5), transportation, and 6), information technology.

3.3.1 Research design

This research was designed with the intention to look at the issues at hand based on feedback received from those staff members dealing on a daily basis with six identified logistics activities. It was therefore proposed that this research be done within a mixed framework. Creswell (2003) indicates that qualitative researchers look for the involvement of their participants in data collection. In experiments and surveys the elements of the research design are sampling, measurement and hypothesis formation which are done prior to the data collection with a quantitative approach. However, with a qualitative approach the design elements in research are worked out during the course of the study. The research methodology and the conceptual framework (see paragraph 2.3: Figure 3) employed were designed taking into account the literature reviewed.

3.3.2 Targeted Population

The table 2, below, provides the information regarding the total number of staff members dealing directly or indirectly with logistics in the Ministry.

Table 2
Population Targeted

Job Categories	Ministerial Totals
Management	47
Supervisory Staff	68
Operational Staff	116
	231

Source: The data adapted from the Ministerial Staff Established approved in 1999.

It was estimated that in the Ministry two hundred and thirty one (231) are dealing directly or indirectly with logistics. The objective was to target twelve (12) people from Windhoek Central Hospital, twelve from Katutura Hospitals, twelve from Rundu Hospitals and eight (8) from each Head Office directorate. Those members targeted by the researcher were about thirty three percent (33%) or seventy six (76). However, the logistics units in the Ministry were not evenly structured with regards to personnel in the logistics units

3.4 Research Methodology

Mouton (2001) stated that surveys result in studies that are usually quantitative in nature and which aim to provide a broad overview of a representative sample of a large population. He further indicated that the strengths of a survey are threefold: Firstly, it has the potential to be generalized to large populations if the appropriate sampling design has been utilised. Secondly, it has high reliability in cases where questionnaires are properly constructed. Thirdly, it constructs high validity if proper controls have been implemented. Based on the above it was decided to use a survey questionnaire that was designed to obtain the data required for this research. In addition, the relevant documents were analysed to determine the current status of the six logistics activities. Thus, the inquiry is based on a mixed method in which the data collected was used for quantitative and qualitative analysis. This was done with three (3) identified hospitals and eight (8) national directorates in the MOHSS with the aim to realise the current status of their logistics operations and activities.

3.5 Data Collection Instruments

Documents, observations and the questionnaire are instruments that were used to collect data. The institutions from which data was collected include: Windhoek Central hospital, Katutura Hospital, Rundu Hospital, and the Ministerial Head Office Directorates.

In the healthcare supply chain there are four parties involved namely, the supplier, the Logistics unit (purchaser), the provider, and the patient. For this research the main focus were the staff members dealing either directly or indirectly with logistics activities. The supervisors of the lower level staff assisted to explain the purpose of the research to this group of employees. The scope of the study was confined to the institution's staff members dealing with the logistics functions, as well as at least six members at management level. Staff members targeted were those who have worked longer than three years at their current position in the Ministry. It was anticipated that those staff members have a fair understanding of the concepts of the seven selected logistics activities, especially procurement, ordering, warehousing, inventory, transport and information technology. Based on the intention to use the above mentioned instruments, data were collected in the following manner:

a) Documents

Documents such as General ledger statements, commitment registers, contracts, payment vouchers, annual reports, Auditor General Statements, stock taking reports, inventory registers, some statistic records of patient and records of information management systems were collected and analysed. The secondary data from the documentary sources were analysed. This provided an opportunity to gain new information that was used in the research.

It was anticipated that those documents reflected useful data with regards to the magnitude of logistics activities (expenditures), integration and co-ordination, procurement intervals, logistics strategies, contract management, processes and systems, especially the use of Information Technology.

b) Observations

Observations were made at selected areas where the logistics activities are taking place. Time was spent within the hospital to observe the operations at warehouses, transport departments, and procurement offices to obtain first hand experiences with regards to the logistic activities. Field notes were compiled throughout the period and a few broad questions were asked.

c) Questionnaire

The staff members dealing with the activities in the logistics channel were randomly selected for completion of the questionnaire. No interviews took place only a short discussion with the supervisors and management to explain the purpose of the

survey and the distribution of questionnaires. There was no need for clarification on any aspects. The respondents chose from a range of responses (close ended questions) or open-ended questions which gave them an opportunity to describe the situation in their own words.

The survey questionnaire is included in this thesis as Appendix A. The research questionnaire had five components with thirty (30) questions/statements. Part A gave the participant an opportunity to provide information about themerselves. It had open ended questions as well as close-ended questions. The second sets (Parts B-E) of the survey questions in the questionnaire are directly related to the research question. The twenty three (23) close ended questions in this survey were in the form of a 5-point Likert scale of which 1= strongly disagree and 5=strongly agree. Another seven (7), close-ended questions with predetermined answers were provided in the questionnaire. The table 3 below illustrated the relationship between the research questions and the survey questionnaire questions with some of the survey questions summarized:

Table 3
Research Questions VS Survey Questions

Open ended Questions	
Origin	**Survey Question**
What is the role of MOHSS in Namibia?	1. Respondent information
Close ended Questions	
Origin	**Questionnaire, Question**
1.2.1 What are the current status of the logistics activities and 1.2.2 Can Third Party Logistics Providers (3Pl's) be used in the logistics service provision in order to improve health service delivery in the MOHSS	1 The use of logistics manuals and guidelines 2. Measuring of logistics activities 3. Appropriate skills 4. Appropriate knowledge 5. Logistics activities integration 6. Customers Services 7. Logistics systems skills 8. Logistics Planning and Control 9. Inventory Planning and Control 10. IT capacity and usage 11. Areas to outsourced 3PL providers 12. Service delivery of institutions

3.6 Pilot Survey

A pilot study was done with six employees, from Rundu Hospital, one of the main targeted institutions. The head of the hospital administration was requested to identify staff members dealing with logistics. Each one received a questionnaire and was requested to record the time of completion. No interview was done after the completion of the questionnaire. The purpose for doing the pilot test was to ensure that the questions are understood easily by the respondents. It was observed by the participants in the pilot survey that Question 3 and 4 had description columns which had no information. These two questions were corrected before the printing of the final questionnaire that was used for the actual research. One participant enquired about the meaning of the term 'outsourcing'. The definition was included on the new questionnaire generated. Only one of the participants indicated the time spent as 25 minutes. The assumption was that because the pilot questionnaire did not have a component to indicate the time spent. The latter was inserted in the new questionnaire as well as a part to thank the participants. In addition, information was provided to explain why the survey was done. The questionnaire was submitted to supervisor for comments and approval. The comments of the supervisor were incorporated. The pilot survey responses were included in the main survey as they represented the perceptions of participants in a less developed town.

3.7 Ethical Consideration

According to Creswell (2003) a researcher needs to develop an informed consent form that should include the following:

- ✓ The right to participate voluntarily and the right to withdraw at any time, so that the individual is not being coerced into participation.
- ✓ The purpose of the study, so that the individuals understand the nature of the research and its likely impact on them.
- ✓ The procedures of the study, so that individuals can reasonably expect what to anticipate in the research.
- ✓ The right to ask questions, obtain a copy of the results, and have their privacy respected.
- ✓ The benefits of the study that will accrue to the individual
- ✓ Signatures of both the participant and the researcher agreeing to these provisions.

In order to ensure that the participants' rights are protected a consent form was developed and the copy of it is attached as appendix B.

3.8 Summary

The purpose of the chapter was to describe the Methodology and design used for the study. The chapter gave a description of the qualitative, quantitative and the mixed method approaches. The reason for selecting a mixed method (qualitative and quantitative) for this research was also explained, as well as the data collection instruments. In addition, ethical considerations were highlighted and a consent form was developed.

4 Chapter 4 Results

4.1 Introduction

This chapter discusses the results obtained in the study. The method employed for data collection was through review of documentation and questionnaires. The Mixed Method was used was employed in this study. The case study method was employed for this study. First, the findings were discussed under each of the six logistics activities as analysed from documents. Second, the participant's personal information is included, which was part of the questionnaire. In addition, the results obtained from the questionnaires are discussed question by question. Then a summary is presented for the status of logistics and each of the six logistics activities which are represented by the Logistics Unit in the conceptual framework.

The primary objective for analysis of the data was to provide data that can be useful to draw a determination whether the current system used in logistics activities conforms to best logistics practices or that the use of 3PL providers be an alternative. Finally a summary is presented at the end of this chapter.

4.2 Description of sample

The sample consisted of three hospitals and eight National Directorates. The two hospitals, Rundu and Katutura hospital are two referral intermediate hospitals, while Windhoek Central Hospital is a National Specialized Hospital. The three hospitals have a bed capacity between 300 and 1200 beds. There are two main functions of the National Directorates which are the development of policies and guidelines and the provision of technical support services to other operational units. The documents were obtained from the Integrated Financial Management System (IFMS), Ministerial Tender Committees (MTC), Annual reports, stock tacking reports, formal tenders, annual tenders, and exemptions for 2012/2013, Commitment Registers, Minutes from Ministerial Transport Committee, and Ministerial Efficiency Committee reports were scrutinized and analysed.

The General Ledger indicated that the four main referral hospitals and the eight national directorates had a total expenditure of N$ 613 306, 209, 41 in the 2012/2013 FY on logistics activities. This represents 23% of the Ministries logistics activities. The breakdown of the logistics expenditures as a percentage, of the three hospitals and eight National directorates are indicated in figure 4 below.

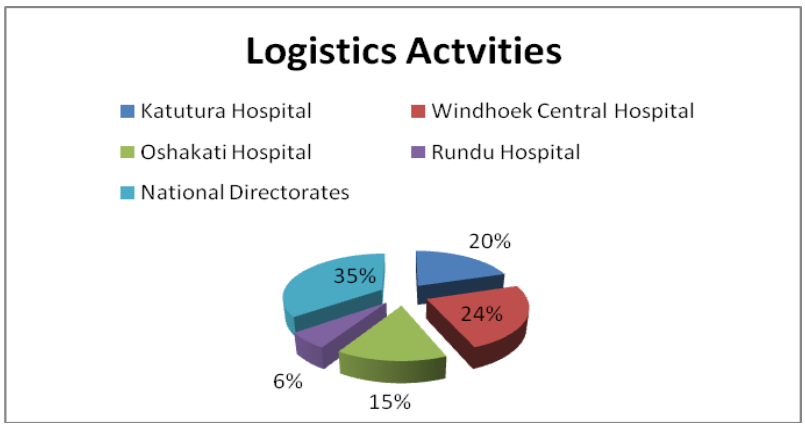

Figure 4. **Logistics Activities Expenditures. The data are adapted from the General Ledger, MOHSS. (IFMS 2012/2013)**

The Ministry of Health and Social Services during the 2012/13 financial year spent N$ 2 091, 465, 788, 98 of its budget on Logistics (procurement activities). This represents 55 % of total expenditure which is indicated in figure 5 below:

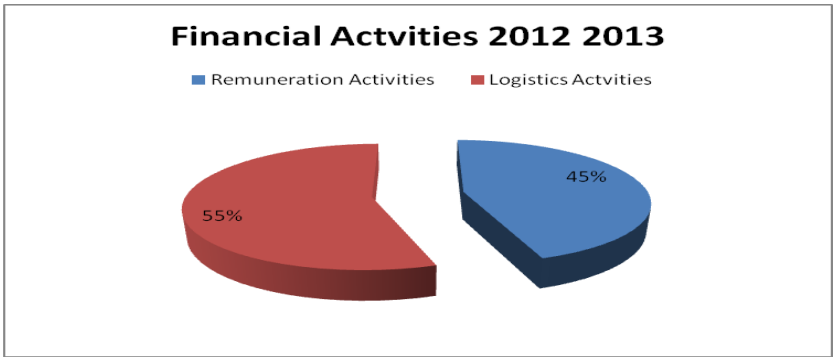

Figure 5. **Financial Activities: The data are adapted form the General Ledger, MOHSS. (IFMS 2012/2013)**

The questionnaire was sent to one hundred (100) staff members and 36 of them responded to the questions. These requests for completion of the questionnaires were delivered by hand, firstly and secondly emails were sent to the managers as a reminder.

4.3 Analysis of data

The presentation and discussion of the data analysed is done in two parts. The first part discussed the analysis of the secondary data obtained from documents reviewed literature for each of the six logistics activities. The second part discussed the thirty (30) questions and statements. There were twenty three (23) Likert scale rating questions. These questions are

divided into three groups. The first group of eleven questions is related to aspects investigated specifically to each of the six logistics activities, namely Procurement, Transport, Warehousing, Information Technology, Ordering and inventory. Issues included, are aspects such as appropriate skills, appropriate knowledge, integration, customer satisfaction, appropriate skills in logistic systems, use of data for decision making, computerization of systems, user satisfaction of IT systems used, standard levels of technology, outsourcing possibilities, and user satisfaction of service delivery. The second group of nine statements in the survey is specifically for logistics planning and control, with emphasis on procurement and inventory. The third set was with regards to general observations.

Data Analysis method: The secondary data was analysed through the use of excel spread sheets. The survey questionnaire had two open-ended questions and twenty eight closed ended questions. The questionnaire survey responses were collected and transferred to excel spread sheets. Data analysis was then organized according to the survey questions. Each of the responses was allocated a value of one (1) in the spread sheet and total values of all the responses were then calculated as percentages. Although there were five ratings in the Likert scale type questions the conclusions were made by adding the percentage scores under strongly disagree & disagree to give the total of those who disagreed The same was done for the percentage scores under strongly agree & agree to give the total of those who agreed. In addition, charts and tables were developed and presented to illustrate the outcome of the responses. The same method was used for open ended as well as close ended questions. The data were analysed using descriptive statistics.

4.3.1 Secondary data analysis

4.3.1.1 Procurement

The Ministry works on a centralized procurement system, with the Tender Board of Namibia (TBN) that provides approval of all procurement activities in the Public Sector. At Ministerial National level, a Ministerial Tender Committee (MTC) makes recommendations to the TBN on goods or services to be procured. The process of procurement is done on needs based requirements. The TBN works on requests from MTC and the MTC is dependent on what the TBN approves, refers back or do not approves. The TBN provides approval for the procurement of goods and services on the following three manners 1) Annual or Multi-year Tenders; 2) Formal Tenders; 3) Exemptions. These processes to get approval work on the following basis:

Annual or Multi-year Tenders- the Ministry draws up the specifications and requested the Tender Board of Namibia (TBN) to advertise for prospective suppliers to provide bids. Most of these tenders are for the use of the Logistics units of the Ministry at various hospitals, regional offices and directorates. During the 2012/2013 FY the Ministry made use of thirty one (31) Annual and Multi-year tenders. The annual tenders can be classified into five types: 1) Supply of Goods/commodities, 2) Supply of services, 3) Supply of equipment, 4) Supply of Furniture, and 5) Supply of Instruments. With Annual and Multi-year tenders, the quantities of goods or services required are not predetermined. On 31St March 2013 eleven annual tenders were considered invalid. Although this represents only 1/3 of all annual tenders (35, 48%), on average, 167 days have lapsed since those contracts have expired. This is the equivalent of 6, 68 months with an average of 25 days working days in a month. This is an indication of too long processes. Thus, in the absence of valid or approved tenders is not possible for any of the hospitals, directorates that need to procure. The documents reviewed, reflected also that once specifications are drawn-up it becomes standard specifications used over a long period. The effect of this can be that as technology develops and changes the specifications become outdated. These contracts (hard copies) are then sent to the various purchasing units. Some of these documents are voluminous and therefore difficult to read. Some contract documents included the non-qualifying company's particulars, such as names and prices. Thus, it becomes a cumbersome process for selection of items and suppliers, as it is done manually. This is an indication of non-use of technology in these logistics activities.

Formal Tenders – The same process is followed when approval is required from the TBN for formal as well as annual tenders. However, in case of formal tenders the quantities of goods and services are predetermined. During the 2012/2013 FY sixty eight (68) formal tenders were advertised. However, not all of these formal tenders were finalized and approved by the TBN during the financial year. Twenty seven (27) of these tenders were only finalized in the following financial year. This reflects a success rate of 57% during this FY. The effect of this is that essential goods and services could not be procured and this has a negative influence on the operations of hospitals, clinics, health centres and offices. The status of the formal tenders was as follows: 1) Awarded= 55, 2) Cancelled = 8, 3) Not Finalized =4 and 4) Declined =1 at the time of the survey is reflected in the Figure 6 below:

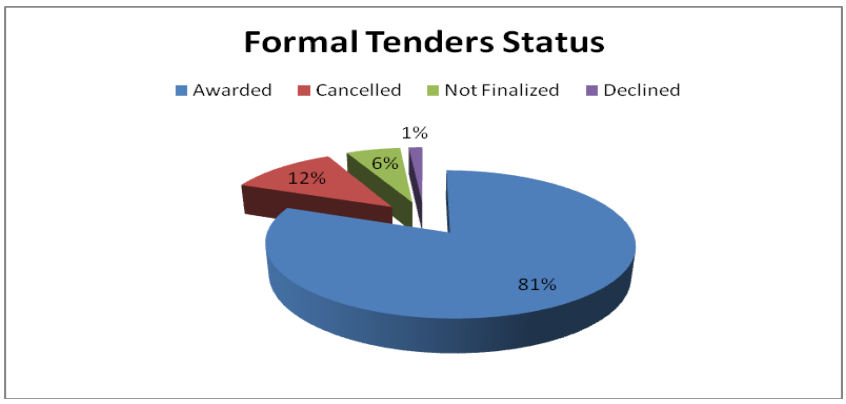

Figure 6. **Status of Formal Tenders: Adapted from MOHSS tender documents, 2012/2013.**

Although fifty five (81%) of F-tenders are indicated as awarded, only twenty eight (51%) were approved by TBN on 31st March 2013. Furthermore the average time taken during the 2012/2013 FY to obtain TBN approval for formal tenders since the date of the advertisement is 103.62 days which is approximately four months. The shortest time taken to finalize a formal tender is 34 days while the longest time is 179 days. It is observed that one of the tender conditions is that prices should be valid for ninety days. However, approximately 33% of the tenders finalized exceeded this requirement. This means that some tenders are only finalized after a price validity period expired. In addition, once approval is obtained from the TBN hard copies of documents are distributed to the requesting units.

Exemptions- Exemption approvals are done annually and on an occasional basis. The annual exemption caters for procurement to be done usually at Municipalities, Town Councils, Local Authorities, Government owned enterprises, payment of subsidies, sole suppliers of certain commodities or when it is impractical to invite tenders. Instances may arise where the purchasing units for one or the other reason prefers to request for exemptions from TBN. During the 2012/2013 FY the Ministry requested for exemption approval on 19 occasions. The approval of any exemptions is done on particular conditions. The annual exemption for certain items and services required a three quotation system. The onus rests on the purchasing units to identify a suitable supplier. Although the TBN made provisions of pre-qualification of suppliers, no documents could be found of any supplier being pre-qualified. Again the purchasing units are informed by fax/letter of the approval and copies are attached.

The procurement system in the Ministry is mainly manually operated according to the documents reviewed. There seems to be an integration of certain aspects of the procurement system, but the control aspects are left in the hands of the individual purchasing units. There is a concern about lack of capacity in the development of specifications for many of the procurement items. Another major concern is lack of use of information technology. The use of IT is to enhance procurement activities and shorten the delays, reduce cost and improve customer satisfaction.

4.3.1.2 Transport

The Ministry runs its own fleet of approximately 1300 vehicles actively involved in the operations of the Ministry. The fleet components of the National Directorates and the three referral hospitals was extracted and indicated in the Figures 7 & 8 below:

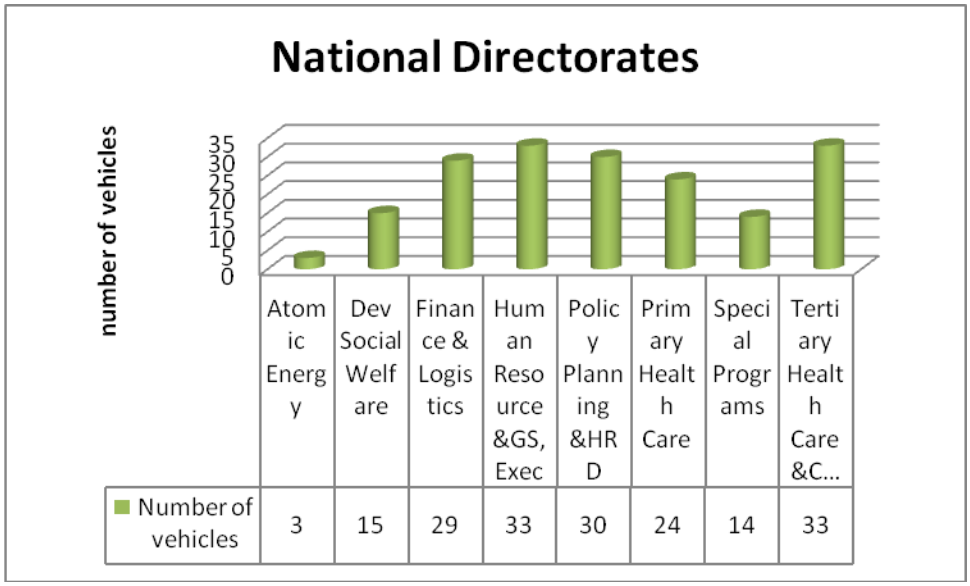

Figure 7. **Vehicles of National Directorates: Adapted from the Master Vehicle Fleet Register, 31 March 2013.**

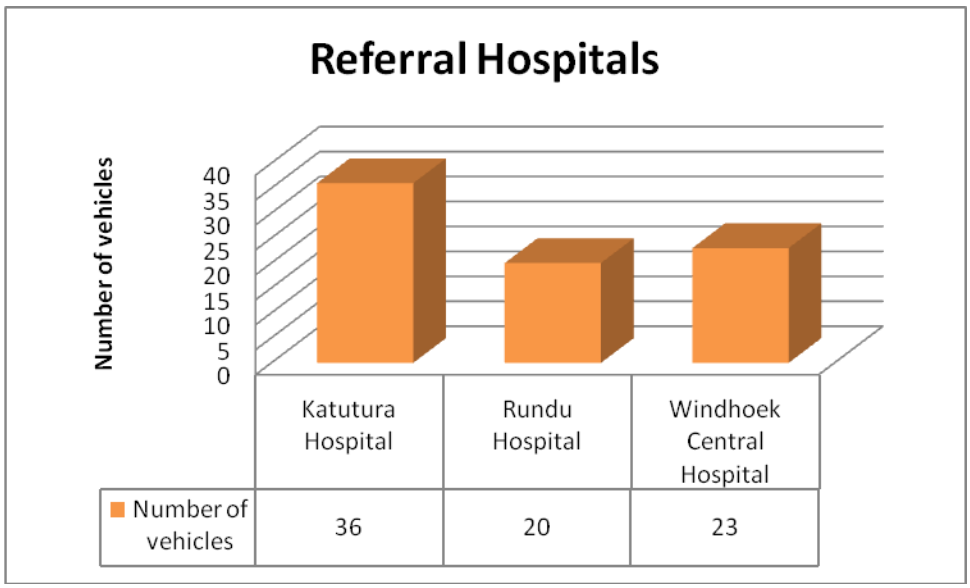

Figure 8. **Vehicles of Referral Hospitals: Adapted from the Master Vehicle Fleet Register, 31 March 2013.**

Transport management has also been decentralized to various management units in the Ministry. Transportation is done for goods and patients and occasionally some vehicles are hired from other institutions. These institutions are making use of their own drivers, although in some instances vehicles and drivers are obtained from other Governmental institutions. Transportation of pharmaceuticals ordered by hospitals is done with an in house fleet of fifteen trucks and delivery vans. Transportation of goods and supplies from suppliers to the storage facilities of the MOHSS depends on the service level agreement signed with a particular supplier. The documents revealed that these institutions do not have a comprehensive fleet management system. All activities are manually recorded and controlled, while some vehicles can be idle for long periods of time at various levels. There is an attempt to obtain a Comprehensive Fleet Management System at the time of the research. References are made to a Ministerial Transport Policy document that gives guidance on aspects of transportation. The management of vehicle assets is done on an excel spread sheet at head office. Discrepancies were found between the Auditor General statement of 2012/2013 and the Master Vehicle Fleet Register. The latter reflected a vehicle fleet component of one thousand seven hundred and fifteen (1715) vehicles, while the former recorded a fleet component of one thousand eight hundred and forty seven (1847). This shows a sign of weakness in the manually operated fleet management system.

4.3.1.3 Warehousing

Storage of goods and supplies are handled by different types of warehouses and stores. Depending on the functionality or the organizational structure, each of the procurement units has their own storage facilities. These facilities do keep stock of various commodities and supplies. The warehouses differ in sizes, functionalities and structures. It was observed that most, if not all of the storage activities are done manually. Some of the stock taking reports reviewed indicated a lack of proper warehouse and storage facilities. The operations of these warehouses are mainly manual with the exception of the CMS.

4.3.1.4 Information Technology

The Ministry has a small unit responsible for Information Technology that is at the head Office. The Ministry has contracted a supplier to implement the Health Information Management System (HIMS), throughout the Country, especially at hospitals. This system was introduced, at two hospitals only, that is, the Windhoek Central Hospital and Katutura Hospital, at the time of this research. This system has the potential to capture the health services data with regard to patients' diseases and patient accounts. Some challenges such as lack of computer equipment and lack of capacity (basic computer skills) are reflected in annual reports. In addition, system documents of the Integrated Financial Management Systems revealed that there are various models, such as Budget, Ledgers, Asset Management (not functional), Accounts Payable, Accounts Receivable, Salaries and DSA. Apart from the IFMS, HIMS, and SYSPRO reports all other reports are from Microsoft excel spread sheets and word documents.

4.3.1.5 Ordering

The order management activities were decentralized to various offices, hospitals, agencies throughout the country. The activities of order management at each of these units are managed by Economizing Committees and procurement committees. The order management function is done with the assistance of the IFMS which is a financial management system with various models, such as General Ledger, Budget, Payment of Suppliers, Salary payment, Daily subsistence Allowances and Asset management. The order processing model's main purpose is for the payment of suppliers and they are not part of an integrated logistics system for the management of stock. Pharmaceuticals and clinical supplies are centrally purchased by the Ministry's Central Medical Stores (CMS), while some general supplies can also be obtained from the Ministry of Works and Transport, General

Stores (MOWT-GS). The CMS unit handles order activities with a procurement budget of over N$500 million for medicines and other related supplies. The Internal requisitions and orders are manually completed and placed by various hospitals and institutions. In contrast, the CMS uses a computerized management system (SYSPRO) for order processing to suppliers, stock control and debtors/creditors control management. Contract management is handled at various operational levels and not as an integrated system. The MTC is regarded as the procurement coordinating body, but no records of complaints could be found. It was found that there is a standard penalty clause (1% of contract value per week) with regards to late deliveries and it is reflected in almost all tender documents. The application of this penalty clause seems not to be implemented. Thirteen five (35) payment vouchers were randomly selected and analysed to determine how long it takes between the date of placement of the order, date of delivery and the date of payment. The data analysed indicated that on average it took 28.57 working days from date of issue of order until the date of delivery. It takes on average 55, 86 working days from the date the order is placed to the date the payment is made. The requirement is to all suppliers within thirty (30) days after the receipt of an invoice. Therefore, the average payment working days are approximately 27, 29 days. However, when the orders issued, are grouped according to the type of authorization used they reflect the following patterns which are illustrated in the Figure 9 below:

- If an annual exemption is used the delivery are done within $\pm$18,29 working days, while it took, on average 51,19 working days to complete the procurement process.
- If annual contracts are used the delivery are done within $\pm$ 45,5 working days, while it took, on average 61 working days to complete the procurement process.
- If formal tenders are used the delivery are done within $\pm$45,15 working days, while it took, on average 64,86 working days to complete the procurement process.
- If special exemption is used the delivery are made within $\pm$27 working days, while it took, on average 60 working days to complete the procurement process.

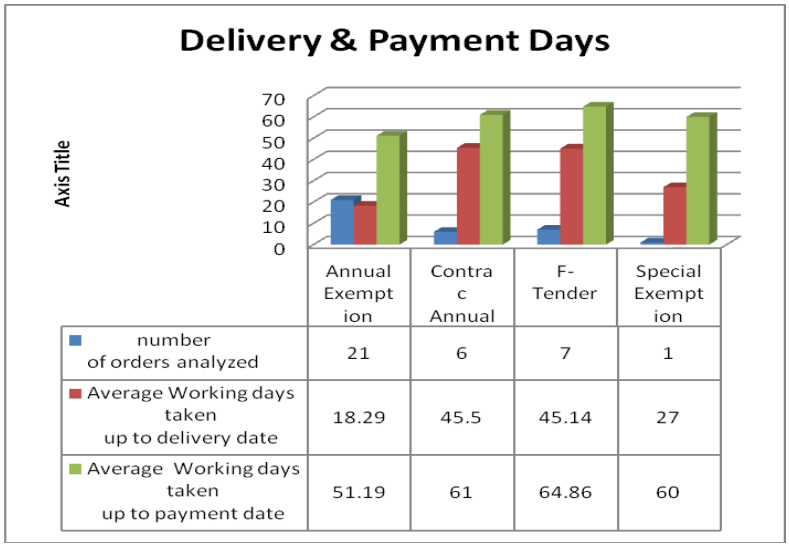

Figure 9. **Delivery and Payment Days: Data are adapted from Integrated Financial Management System, Accounts Payable. (2012/2013FY)**

4.3.1.6 Inventory

It was found that there are three terms that are used interchangeably; inventory management, stock management and asset management. The assets of the institutions are handled in accordance with the rules and regulations determined by Treasury in the Ministry of Finance. CMS used a computerized inventory management system (SYSPRO) for order processing, stock control and debtors/creditors control management. During the 2012/2013 FY the General Ledger indicated that inventory items (consumables) to the total value of N$711 685 049-36 were procured and in addition, fixed assets (furniture and office equipment, vehicles and Medical Equipment), to the value of N$71 958 569-76 were purchased. In total N$ 783 643 619-12 were spent on inventory and assets during the financial year. Figure 10 indicated at least 37% of the logistics activities are for assets and inventory management.

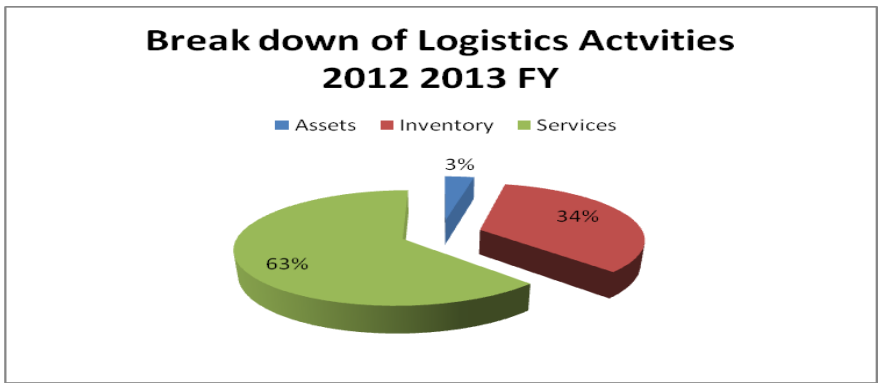

Figure 10. **Logistics subcomponents:Adapted from GL 2012/2013 (MOHSS)**

This gives a clear indication that large amounts and time are spent on issues relating to inventory and asset management. It was observed that all other inventory and asset management activities are done manually. The transactions of the inventory are done on a stock card system, whereby goods received in stores are entered on the stock cards. The stock card reflects minimum and maximum re-ordered quantities. However, the replenishment of items seems to be done only when shelves were almost empty or empty. These stock cards are completed by stores officials manually and kept in arch lever files. No documents could be found that describe the basic operations with regards to inventory management. There are two Inventory Master List catalogues, and both are hard copies, one of them is the CMS and the other one is from the MOWT- GS. Each one of these catalogues contains over one thousand (1000) items. There are also other inventory items, apart from the ones in the two catalogues which have been procured. There is also no system that provides the status of the inventory (stock levels) at any given point in time. Stock levels are determined by going through the files, card by card. The Auditor General report for the FY 2012/2013, item 34: Stock Depots with regards to Stock on Hand reflected that stock on hand was to the value of N$ 176 025-24 which is only from one Directorate at National level. The stock levels are only determined and reported annually and only on the following items 1) Official forms 2) Stationary, and 3) Cleaning Materials. With the exception of the CMS, documents revealed that inventory management is manually operated. The stock levels of the CMS inventory are determined electronically on any day or time and per item. Asset management is done manually and verification of the assets is done annually. Annual stock taking reports and the Auditor General report of 2011/2012 FY reviewed indicated that there are various challenges. These challenges were 1) No stock takings done at various clinics and hospitals, 2) Assets do not have the correct GRN identification mark. There are, however documents that indicated Asset

Management of Government is in the process of being computerized as part of the IFMS. Data capturing was at an advanced stage, according to the MOF. However, excel spread sheets and word documents are being used when reports are compiled, according to the documents reviewed. There are no formal processes on how the asset values are determined and whether a formal process of depreciation is used. The above mentioned is an indication that there is a lack of capabilities and resources with regards to inventory and fixed asset management. In addition, required stock levels are not determined scientifically but they are determined through a process of physical observation.

4.3.1.7 Summary of documents reviewed

In conclusion to the findings from the documents reviewed table 4 below, presents the status of what was found in the analysis of the documents. This is with regards to the strengths and weaknesses on the logistics activities.

Table 4.
Summary Secondary Data: Strengths and weaknesses

	Strengths	**Weaknesses**
Procurement Management	Some coordination of procurement activities exists.	Partly manual operations, Lack of capacity, long and bureaucratic processes. Not fully integration of processes and activities.
Order Management	Partly Computerized, reasonably short payment days,	Fragmented system for Contract management, partly manually controlled, operations, lack of usage of the latest technologies, lack of application of contract management
Storage (warehousing)	Plans are there to change to computerized warehouses	Manually operated Warehouses (stores), lack of usage of latest Technology. No integration of activities with other stakeholders
Inventory management	Partly computerized for pharmaceuticals at National level	Manually operated, no formal system of inventory management. A little coordination and integration of inventory activities. Lack of usage of latest technology.
Transportation	Attempts to change to Comprehensive fleet management system. Transport Policy in place.	Manually operated, no coordination of services, lack of capacity, a little coordination and integration of services. Transport Policy outdated Lack of usage of latest technology
Information Technology	HIS in implementation.	Lack of Capacity, Fragmented systems, Limited usage of latest technology.

Source: The data adapted from annual reports, stock taking reports, Master Vehicle Fleet register, economizing committee registers, Ministerial Transport Committee Minutes- MOHSS 2012/2013FY.

4.3.2 Questionnaire responses

Q1: **Tell us about your gender, working experience and educational information:**

a) Participants Gender information: The respondents also indicated their gender of which 55% were female and 45% were male as indicated in Figure 11 below:

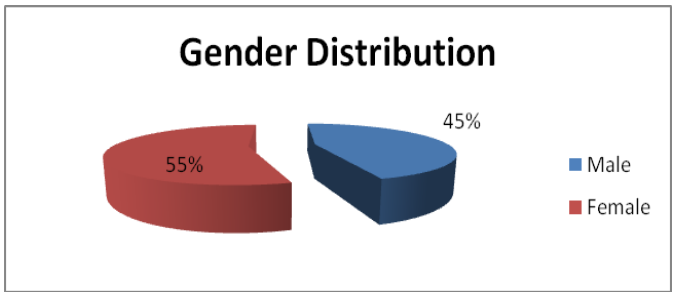

Figure 11. **Gender distribution of participants. Source: Data are from the survey responses.**

b. Participants Working Experience: The respondents also indicated their working experience, of which 72% have more than five years and 22% have more than 3 years but less than 5 years and this is illustrated in Figure 12.

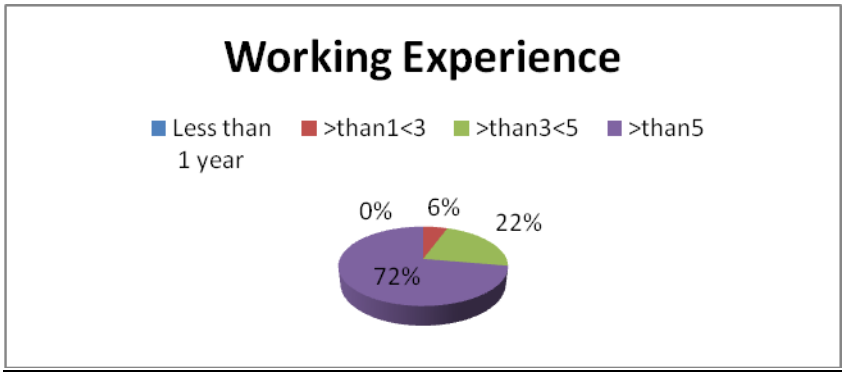

Figure 12. **Working experience of participants. Source: Data are adapted from the survey responses.**

c. **Participants Educational Information:** In addition, the respondents were also required to state their level of qualifications and the chart below gave an indication of the qualification status of these participants. Approximately 39 % of the participants have a Tertiary qualification and are made up of mostly the supervisors and managers. There is no one with a tertiary education in the field of Logistics. The operational staff, mainly have Grade 10 and Grade 12 Certificates. Figure 13 below illustrates the education levels of the participants.

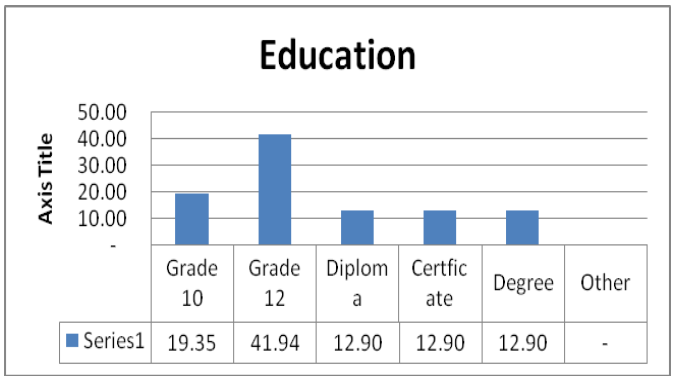

Figure 13. **Education Levels of Participants. Source: Data are adapted from the survey responses.**

Q2. In which of the following settings are you working? The respondents fulfilled various roles within the selected hospitals as well as at the Head Office directorates. The classes of participants according to their roles and categories were predetermined as part of the questionnaire. This was representative of 13.90% managers, 29.03% supervisors and 58.06% operational staff as indicated in Figure 14 below:

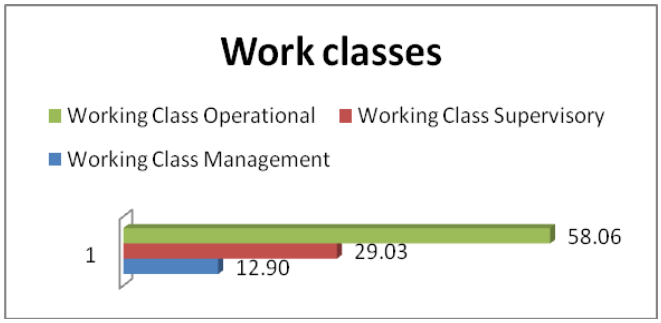

Figure 14. **Areas of Responsibility of participants. Source: Data are adapted from the survey responses.**

Q3. Please indicate if you use any logistics guidelines (if yes, name manuals & guidelines?
The data analysed reflected that 60 % of the participants indicated that manuals and guidelines are available and are used. Thus, 40% do not use guidelines or do not have guidelines and manuals. Those who indicated they use guidelines or manuals stated that it is mostly the Treasury Instructions, issued by Ministry of Finance and a Ministerial Transport Policy. Therefore, it can be concluded that there are no other logistics operational guidelines or manuals. Figure 15 below illustrates this.

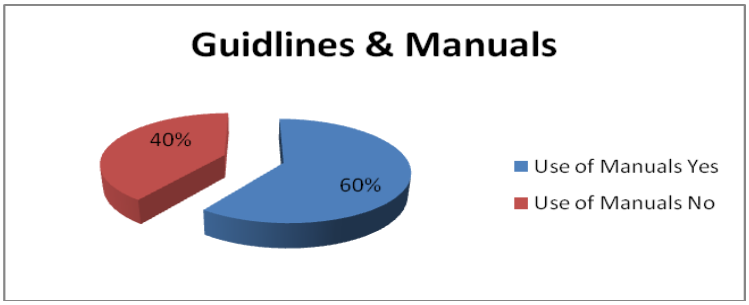

Figure 15. **Guidelines & Manuals use. Source: Data are adapted from the survey responses.**

Q4: In your opinion is it important to have the appropriate skills in the logistics systems. The responses received gave an indication that 14.36 % of the respondents have appropriate skills in the logistics systems, while 80.38% agreed that it is important to have appropriate skills in the logistics systems. The table 5 indicates the response on the importance of appropriate skills in the logistics system.

Table 5.
Appropriate skills in logistics systems

	Appropriate skills in logistic systems,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Logistics Systems	8.13	6.23	5.27	9.53	70.85

Source: Data are adapted from the survey responses.

Q5: Please rate to what extend do you respond to any of the logistics measures captured: The data analysed reflected that 22.58% and 35.48 % of the participants indicated that actions are taken on measures captured. Forty two percent (42%) of the interviewees indicated that no action was taken. Figure 16 indicates the measures taken.

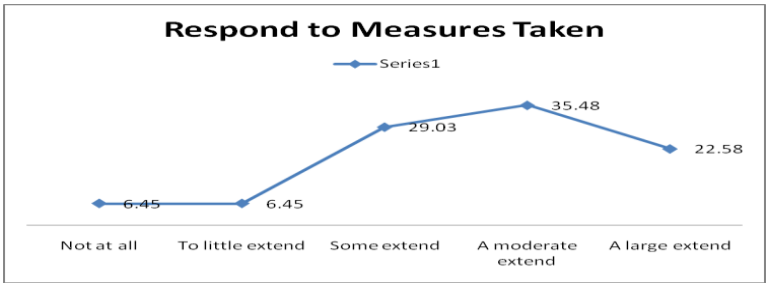

Figure 16. **Respond on Measures taken. Source: Data are adapted from the survey responses.**

Q6: Procurement planning is essential for effective service delivery: It was on average 88.88% that agreed that procurement planning is essential for effective service delivery.

Q7: Procurement control is essential for effective service delivery: It was on average 85.71% that agreed that procurement control is essential for effective service delivery.

Q8: Inventory planning should be done manually: It was average 34.29% that did not agree that inventory planning should be done manually.

Q9: Inventory planning should be done scientifically. It was average 80% that agreed that inventory planning should be done scientifically.

Q10: When goods are delivered quantities are verified. It was on average 82.86% agreed that when goods are delivered quantities are verified.

Q11: When goods are delivered, quality checks are done? It was on average 74.28% agreed that when goods are delivered, quality checks are done.

Q12: Products are delivered at the best prices? It was on average 73.53% that agreed that the products are delivered at the best prices**.**

Q13: Products are standardized? It was on average 62.86% that agreed that products are standardized.

Q14: Item Master lists are used in the hospital/directorate? It was on average 68.57% that agreed that the Item Master lists are used in the hospital/directorate.

The results of the participant's responses are reflected in Table 6, below:

Table 6

Planning & Control

		Logistics Planning and Control				
		Strongly Disagree	Disagree	Neither agree nor Disagree	Agree	strongly Agree
1	Procurement Planning	5.56	2.78	2.78	19.44	69.44
2	Procurement Control	5.71	5.71	2.86	28.57	57.14
3	Inventory Planning Manual	28.57	17.14	20.00	25.71	8.57
4	Inventory Planning Scientifically	2.86	5.71	11.43	34.29	45.71
5	Quantities verification	5.71	5.71	5.71	14.29	68.57
6	Quality Checks	5.71	11.43	8.57	17.14	57.14
7	Best Prices	2.94	5.88	17.65	26.47	47.06
8	Products standardization	2.86	8.57	25.71	22.86	40.00
9	Use of item master list	2.86	17.14	11.43	34.29	34.29

Source: Data are adapted from the survey responses.

Q15: Please rate (1-5) the following statement "I have the appropriate skills for each one of the following logistics activities: The table 7, below reflects the responses of the participants.

Table 7
Appropriate skills

	Appropriate skills				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	14.29	11.43	17.14	25.71	31.43
Transport	8.33	22.22	16.67	30.56	22.22
Ware Housing	8.57	31.43	25.71	22.86	11.43
Information Tech	11.43	34.29	22.86	28.57	2.86
Ordering	5.71	25.71	8.57	25.71	34.29
Inventory	5.71	22.86	14.29	40.00	17.14
	9.01	**24.66**	**17.54**	**28.90**	**19.89**

Source: Data are adapted from the survey responses.

The results show that 33.67 % of the respondents do not have the appropriate skills in logistics activities while 48.79 do have the appropriate skills in logistics activities. Warehousing and Information technology skills are at the lower end.

Q16: Please rate (1-5) the following statement "I have appropriate knowledge of each one of the following logistics activities: The table 9, below reflects the responses of the participants.

Table 8
Appropriate knowledge

	Appropriate knowledge,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	11.11	5.56	22.22	36.11	25.00
Transport	11.11	13.89	11.11	36.11	27.78
Ware Housing	11.11	22.22	25.00	27.78	13.89
Information Tech	25.00	22.22	22.22	25.00	5.56
Ordering	8.33	13.89	19.44	22.22	36.11
Inventory	8.33	13.89	19.44	30.56	27.78
	12.50	**15.28**	**19.91**	**29.63**	**22.69**

Source: Data are adapted from the survey responses.

The results indicate that 27.78 % of the respondents do not have the appropriate knowledge of logistics activities while 52.32 do have the appropriate knowledge of logistics activities. Information Technology and Warehousing are at the lower end.

Q17: Please rate the statement "There is integration with regards to the following logistics activities" The table 9, below reflects the responses of the participants.

Table 9
Integration of activities

	Integration,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	8.33	16.67	13.89	33.33	27.78
Transport	14.29	22.86	25.71	31.43	5.71
Ware Housing	20.00	20.00	25.71	25.71	8.57
Information Tech	8.57	14.29	37.14	34.29	5.71
Ordering	5.71	22.86	22.86	34.29	14.29
Inventory	11.43	22.86	25.71	31.43	8.57
	11.39	**19.92**	**25.17**	**31.75**	**11.77**

Source: Data are adapted from the survey responses.

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The results show that 31.31 % of the respondents do not agree that there was an integration of the logistics activities while 43.52 % agreed that there is integration in the logistics activities. Transport, Warehousing, Information Technology and Inventory are at the lower end.

Q18: Please rate the statement "Customers are satisfied with regards to the following activities? Table 10, below reflects the responses of the participants.

Table 10
Customer satisfaction

	Customer satisfaction,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	12.12	12.12	18.18	36.36	21.21
Transport	12.50	18.75	28.13	31.25	9.38
Ware Housing	21.88	18.75	21.88	37.50	-
Information Tech	15.63	9.38	34.38	37.50	3.13
Ordering	9.38	12.50	25.00	40.63	12.50
Inventory	12.50	15.63	31.25	34.38	6.25
	14.00	**14.52**	**26.47**	**36.27**	**8.74**

Source: Data are adapted from the survey responses.

The results show that 28.52 % of the respondents do not agree that the customers were satisfied with logistics activities while 45.01 % do agree that the customers were satisfied with logistics activities. Warehousing, transport, information technology and inventory are at the lower end with ordering and procurement at the highest rating on customer's satisfaction.

Q19: Please rate the following statement "management uses data for decision making in the following logistics activities? The table 11, below reflects the responses of the participants.

Table 11
Use of data for decision making

	Use of data for decision making,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	13.89	5.56	13.89	33.33	33.33
Transport	11.43	14.29	14.29	31.43	28.57
Ware Housing	8.57	22.86	31.43	22.86	14.29
Information Tech	11.43	2.86	31.43	37.14	17.14
Ordering	8.57	17.14	14.29	37.14	22.86
Inventory	11.43	25.71	25.71	17.14	20.00
	10.89	**14.74**	**21.84**	**29.84**	**22.70**

Source: Data are adapted from the survey responses.

The results show that 25.63 % of the respondents agreed that management do not use data for decision making in the logistics activities while 52.54% agreed that management uses data for decision making in the logistics activities. Warehousing and inventory are at the lower with regards to the usage of data for decision making by managers.

Q20: Please rate the following statement" The following systems that are being used in logistics activities are computerized" Table 12, below reflects the responses of the participants.

Table 12
Computerization of systems

	Computerization of systems,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	16.67	8.33	16.67	19.44	38.89
Transport	28.57	25.71	14.29	20.00	11.43
Ware Housing	22.86	31.43	31.43	5.71	8.57
Information Tech	8.82	11.76	35.29	23.53	20.59
Ordering	11.43	14.29	22.86	31.43	20.00
Inventory	22.86	31.43	25.71	14.29	5.71
	18.53	**20.49**	**24.37**	**19.07**	**17.53**

Source: Data are adapted from the survey responses.

The results show that 39.03 % of the respondents do not agree that the systems used in logistics activities are computerized while 36.60% do agree that the systems used in logistics activities are computerized. Warehousing, Inventory and Transport are at the lower end, with regards to computerization of systems.

Q21: Please rate the following statement. "I am satisfied with IT systems in my working environment in relation to the following logistics activities" Table 13, below reflects the responses of the participants.

Table 13.
User's satisfaction of IT systems

	Users satisfaction of IT systems used,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	22.22	13.89	13.89	33.33	16.67
Transport	34.29	25.71	20.00	14.29	5.71
Ware Housing	28.57	31.43	28.57	5.71	5.71
Information Tech	22.86	22.86	22.86	17.14	14.29
Ordering	11.11	16.67	33.33	25.00	13.89
Inventory	26.47	29.41	26.47	8.82	8.82
	24.25	**23.33**	**24.19**	**17.38**	**10.85**

Source: Data are adapted from the survey responses.

The results indicate that 47.58 % of the participants are not satisfied with IT systems in their working environment in relation to logistics activities. However, 28.23% do agree that they are satisfied with IT systems in their working environment in relation to logistics activities. Warehousing, Inventory and Transport are at the lower end, with regards to satisfaction with IT systems in the working environment.

Q22: In your opinion are the following systems up to standard with regards to technology? Table 14, below reflects the responses of the participants.

Table 14.
Standard levels of technology

	Standard levels of technology,				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	13.51	16.22	27.03	10.81	32.43
Transport	22.22	30.56	25.00	13.89	8.33
Ware Housing	19.44	41.67	22.22	8.33	8.33
Information Tech	13.89	25.00	22.22	22.22	16.67
Ordering	13.89	27.78	16.67	25.00	16.67
Inventory	27.78	30.56	16.67	16.67	8.33
	18.46	**28.63**	**21.63**	**16.15**	**15.13**

Source: Data are adapted from the survey responses.

The results show that 47.09 % of the respondents do not agree that the systems are up to standard with regards to technology, while 28.60% agreed that the systems are up to standard with regards to technology. Warehousing, Inventory, and Transport are at the lower end, with regards to satisfaction with IT systems in the working environment.

Q23: How often do you get training in Information Technology? The majority (87%) of participants indicated that training in Information Technology is not taking place. Figure 17 below reflects how the participants rated the training aspect in IT.

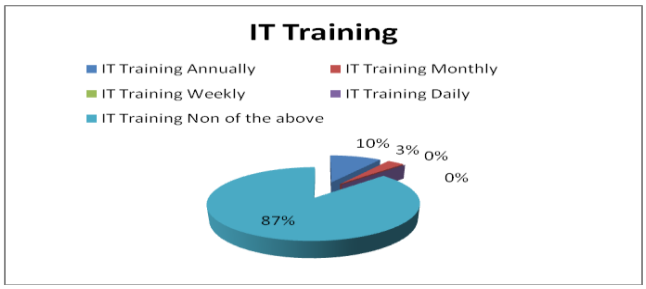

Figure 17. **IT Training. Data are adapted from the survey responses**

Q24: Please indicate which form of communication within the supply chain you are using when dealing with your stakeholders. The participants indicated that they use a combination between letters, internet, and telephone methods. However a smaller portion (20.31%) makes use of the internet as a way of communication to suppliers. A large portion (79.69%) of the participants indicated that they still make communication through telephones and letters with their suppliers. See Figure 18 below:

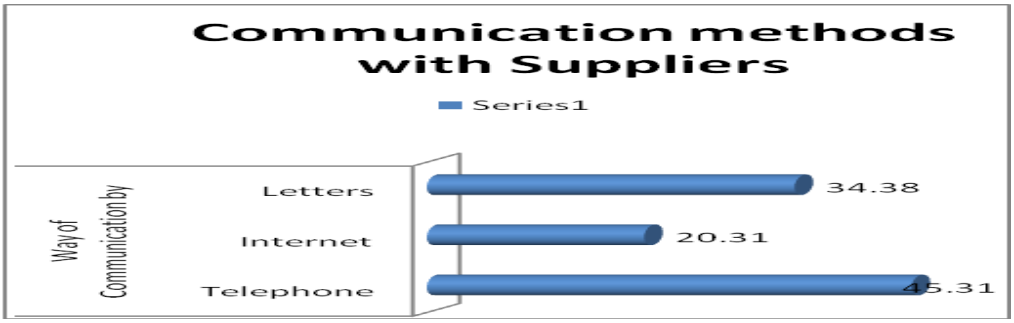

Figure 18. **Communication methods. Data are adapted from the survey responses.**

Q25: Please rate the following statement "there is a need to outsource the following logistics activities" Table 15, below reflects the responses of the participants.

Table 15.
Outsourcing possibilities

	Outsourcing possibilities, and				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	25.00	33.33	16.67	11.11	13.89
Transport	11.43	20.00	14.29	**25.71**	**28.57**
Ware Housing	14.29	17.14	22.86	**22.86**	**22.86**
Information Tech	8.57	14.29	31.43	**22.86**	**22.86**
Ordering	14.29	42.86	20.00	14.29	8.57
Inventory	25.71	20.00	14.29	**25.71**	**14.29**
	16.55	**24.60**	**19.92**	**20.42**	**18.51**

Source: Data are adapted from the survey responses.

The results show that 41.15 % of the respondents do not agree that there is a need to outsource some of logistics activities. Moreover, 38.93% of the participants agreed that there is a need to outsource some of logistics activities. Transport, Warehousing, Inventory and Information Technology are the logistics activities that more participants agreed that there is a need to outsource.

Q26: In your opinion do you agree that you are satisfied with the provision of service delivery in the logistics activities? Table 16, below reflects the responses of the participants.

Table 16.
User's satisfaction of facilities

	User's satisfaction of service delivery.				
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Procurement	8.33	11.11	25.00	44.44	11.12
Transport	8.33	22.22	16.67	47.22	5.56
Ware Housing	5.56	30.56	33.33	25.00	5.56
Information Tech	16.67	30.56	25.00	22.22	5.56
Ordering	5.56	19.44	30.56	33.33	11.11
Inventory	2.78	36.11	27.78	27.78	5.56
	7.87	**25.00**	**26.39**	**33.33**	**7.41**

Source: Data are adapted from the survey responses.

The results show that 32.87 % respondents of the do not agree that they are satisfied with the provision of service delivery in logistics activities. In addition, 40.74% of the participants agreed that they are satisfied with the provision of service delivery in logistics. Information Technology, Warehousing, and Inventory are the lowest rated by the participants of which service delivery was considered to satisfactory.

Q27: Overall, my institution/hospital delivers a good service to our clients. The data analysed indicated that 50.00% of the participants agreed that the facilities deliver better services to their clients. Furthermore, 25 % indicated that they neither agree nor disagree with good service delivery. Almost 1/4 (25.00%) indicated that the institutions do not deliver good services. See Figure 19 below:

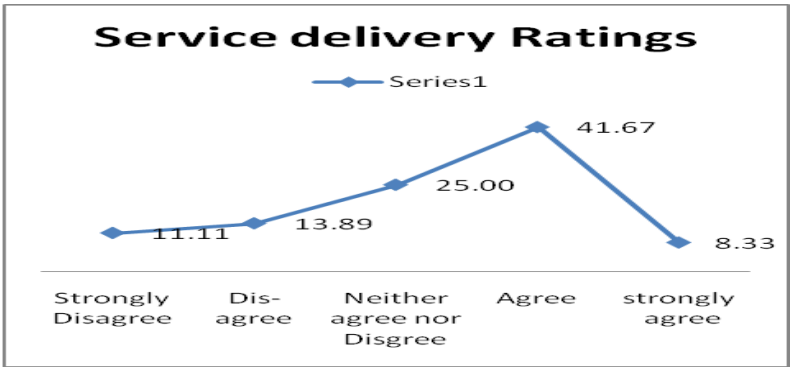

Figure 19. **Service Delivery Ratings. Data are adapted from the survey responses.**

Q28: I have completed the questionnaire in ----------minutes approximately.

In order to determine degree of difficulty of the questions in the questionnaire participants were asked to indicate the time they spent completing it. The participant's on average spent 27 minutes completing the questionnaire with the exception of one who indicated 5 hours. The one who spent 5 hours did not complete it in one go due to disruption during working hours.

4.4 Reliability and Validity of instruments

Mouton (2009) stated that in order to collect data some form of measuring instrument has to be used. He further stated that in human scientific measuring instruments refer to such instruments as questionnaires, observation schedules, interview schedules and psychological tests. Any instrument used to collect data has to demonstrate reliability and validity.

4.4.1 Reliability of Instruments

Reliability is defined by Robbins and Decenzo (2001) as "the degree to which a selection device measures the same thing consistently" (p.192). They further explained that if a test is reliable, any individual's score should remain fairly stable over time, assuming that the characteristics it is measuring are also stable. The following was done to ensure the reliability of the survey results:

- Definitions of specific terms were provided at the beginning of each main area to ensure the respondents understood the meanings of the questions;
- A pilot research survey was conducted with a group of staff members and their feedback was incorporated into the questionnaire;
- Feedback from participants were considered;
- The feedback from the research supervisor was considered and incorporated.

4.4.2 Validity of Instruments

Reliability is defined by Robbins and Decenzo (2001) as "The proven relationship between a selection device and some relevant criterion" (p. 192). They articulated that any deviceor instrument, such as application forms, test, interviews or physical examinations, a manager uses must demonstrate validity. Therefore, there must be a proven relationship between the instrument and some relevant measures. The following was done to ensure the validity of the survey results:

- The research supervisor ensured that content of the survey was reviewed in relation to the survey objectives and the survey questionnaire. The objective was to ensure that the research questions have been answered sufficiently.
- Twenty five (25) of the thirty (30) questions were close-ended questions. In addition, twenty three (23) of the close ended questions were in the form of a 5 point Likert scale. Thus, the questions were simple to answer and even easy to analyse.

4.5 Limitations observed

The limitations observed were mostly as a result of the time factor and work activities of many of the officials visited. Many of the operational staff members were busy with exams at Tertiary Institutions. The management was busy in meetings and usually not available over weekends. The terms used may sometimes be unfamiliar, although this was not expressed by the repondents.

4.6 Summary

The results from the data collected were described in this chapter. The methods used during the analysis process of the data were explained. The data were categorized under logistics and its six activities: 1) Participant information, 2) Procurement, 3) Ordering 4) Warehousing, 5) Transport, and 6) Information Technology.

5 Chapter 5 Discussion

5.1 Introduction

This chapter discussed the meaning of the results of the survey found in chapter four and how the research questions were addressed as a result of the interpretation of the data analysis. It also revisits the research questions. The chapter is closed off with a section on a summary of the findings. In order to score the results of the survey a valuation score system was developed thereof:

1. 0%-50% = Great Concern:
2. 51%-70%= Fairly acceptable, but need interventions
3. 71%-100%= Acceptable

5.2 Main Results

The survey focused on logistics and six of its activities with Information Technology as the activity that links all activities. The outcomes of the main results are the following:

5.2.1 Logistics

The participants were in agreement that it is important to have the appropriate skills in the logistics system. It is clear from the responses that the participants have a good understanding of logistics planning and control, especially with regards to procurement and inventory management. The score on the fact that inventory planning should be done scientifically was rated as acceptable. Quantities verification, quality checks and best prices were also rated as acceptable. Product standardization and the use of master list were rated fairly acceptable, but need interventions. The usages of guidelines and manuals were rated fairly acceptable, but need interventions. Mostly Treasury instructions and the Transport Policy have been mentioned. There seem to be no other logistics guidelines or manuals used which may mean that they are not in use. It can be concluded that 1/3 of the mistakes or omissions detected are not receiving proper attention.

5.2.1.1 Procurement

The survey results for procurement reflected an average agreement score between 25% and 66.67%. The users were not satisfied with the system and the technology used in procurement. These two areas were identified as areas of great concern. Most of the issues under procurement obtained scores as fairly acceptable, but need some interventions. Theseare with

regards to appropriate skills, appropriate knowledge, systems integration, customer satisfaction, use of data for decision making, computerization of the procurement system, and user's satisfactions of service delivery by the institution. The participants were also not in agreement that the procuring activity should be outsourced.

5.2.1.2 **Transport**

Some of the issues under transport obtained scores as fairly acceptable, but need some interventions. The participants were not satisfied with the transport system integration, customer satisfaction, computerization system and the technology used in transport. These areas were identified as areas of great concern . These are: appropriate skills, appropriate knowledge, use of data for decision making, and user's satisfactions of service delivery by the institution. The participants were also in agreement that the transport activity should be outsourced.

5.2.1.3 **Warehousing**

Almost all the issues under warehousing obtains scores that show that they areareas of great concern. These concerns were with regards to appropriate skills, appropriate knowledge, systems integration, customer satisfaction, use of data for decision making, computerization of the warehousing system, and user's satisfactions of service delivery by the institution. The users were also not satisfied with the system and the technology used in warehousing. The participants were also in agreement that the warehousing activity should be outsourced.

5.2.1.4 **Information Technology**

Most of the issues under information technology obtained scores which show that they are areas of great concern to the participants. These are: appropriate skills, appropriate knowledge, systems integration, customer satisfaction, computerization systems, and user's satisfactions of service delivery by the institution. The users were also not satisfied with the system and the technology used in information technology. The use of data for decision making was rated fairly acceptable but needs interventions. The participants were also in agreement that the Information technology activity be outsourced.

5.2.1.5 **Ordering**

The survey results for ordering reflected an average agreement score of between 22.86% and 60.00%. Some of the issues under ordering obtained scores which show that they are areas of great concern. These are systems integration, and user's satisfactions of service delivery by the institution. The users were also not satisfied with the system and the technology used in ordering. Appropriate skills, appropriate knowledge, customer satisfaction, use of data for

decision making and computerization of the ordering system were rated fairly acceptable but need interventions. The participants were also not in agreement that the procuring activity should be outsourced.

5.2.1.6 **Inventory**

Some of the issues under ordering obtained scores which show that they are areas of great concern to the participants and these are integration, customer satisfaction, use of data for decision making, computerization of system and the technology used in inventory. Appropriate skills, and appropriate knowledge, were rated fairly acceptable but need interventions. The participants were also in agreement that the Information technology activity be outsourced.

5.3 Research questions revisited

This research was based on two sets of questions a set five sub questions and a set of one main question.

5.3.1 Sub question one: What service logistics is?

Based on the literature review, it is clear that logistic services became a focal point of many institutions with regards to accomplishing effectiveness and efficiency in their operations. Service logistics and management is the governance of the supply chain functions. The logistics management activities include transportation management (inbound and outbound), fleet management, order fulfilment, materials handling, warehousing, inventory management, logistics network design, and management of third party logistics service providers (Murphy & Wood, 2008). It also includes customer services, sourcing and procurement, production planning and scheduling, packing and assembly. However, for this research only six activities [1) Inventory, 2) Procurement, 3) Ordering, 4) Warehousing, 5) Transport and 6) Information Technology] were identified. The reason for selecting those six activities came from the current six ministerial logistics activities. In the final analysis, Logistics Management is part of all levels of planning and execution, strategic, tactical and operational. Healthcare services are complex and dynamic; therefore, the support functions such as service logistics should be at the core of the operations of the health care system.

5.3.2 Sub question two: What is best practice in logistics services?

In relation to the best practice in logistics services as well as in service delivery in the health sector there are many important aspects. As stated by Perin et al. (2007) that best practice is doing the right things right and that this be developed through benchmarking,

learning and gleaning skills from strategic alliance partners. These aspects include issues such as:

1) Integrated logistics management services for customer demand (Xiao et al., 2013)
2) Extensive information system support (Xiao et al., 2013)
3) Continuous adoption of the information or automation technologies (Mason- Jones & Towill, (1999)
4) Technology, knowledge, and relationship networks (Sauvage, 2003)
5) Outsourcing (Laarhoven et al. 2000), Sandor et al. (1999), Lieb & Randall (1999), Lieb & Miller (2002) and Leahy et al. (1995)

However the main emphasis fell on three aspects:

Firstly, the integration of processes and systems that allow for better coordination and planning (Xiao et al., (2013). Logistics encompasses all of the activities with regard to materials and information flow throughout the organization. The main objective of inventory management is to bring the right product and services at the right time and at the right place. Thus inventory management can be regarded as the core activity of logistics. In the Public health care services in Namibia, inventory management must be placed at the forefront with regards to strategic interventions. Each one of the other activities, processes and systems must be established as an integrated part of inventory management.

Secondly, Laarhoven et al., 2000 indicated that outsourcing and the use of 3PLs as an alternative has become increasingly popular. Use of third party logistics providers has become a strategy in many organizations, which allow them, either to concentrate on their core functions or to save on cost and investments in logistics activities (Jiang et al., 2007). Although the use of 3PLs can be considered because of reasons that seems to be beneficial to many institutions other managerial aspects must be considered. Moving from in-house logistics to 3PL may bring fear of job losses which Trade Unions will not take lightly. The concept of 3PL providers must be clearly understood from the highest authorities to the lowest levels. Long and intensive negotiations and systematic approaches by management should be considered. The selection of the 3PL provider should be done carefully and systematically. Once the selection is done, well defined service level agreements should be negotiated by management.

Thirdly, the use of Information Technology forms the basis and the link between all parties in systems involved which ultimately should ensure effectiveness. It was Xiao et al. (2013) who indicated that extensive information system support is critical to facilitate decision making and enhance responsiveness to customer's request. What is essential for any management systems are information and reporting systems. These systems contain the data and drive the decisions which are based on the data collected. Information technology facilitates the integration of activities and process of logistics.

5.3.3 Sub question three: What are the benefits/costs of using 3PL's compared with in-house logistics services?

With regards to benefits and cost when making use of Third Party Logistics Providers, the literature indicated the following issues as benefits: 1) Save Cost and Time (McGinnis & Kohn, 2002); 2) Expertise (Crum & Benjamin, 1997); 3) Focus on core business (Norek & Pohen, 2001); 4) Resource Network (Crum & Benjamin, 1997); 4) Improve IT system (Crum & Benjamin,1997)-continuous optimization.

In addition, three issues relate to costs and these are: 1) Protection of company information (Van damme & Van Amstel (1996); 3) Risk of losing expertise and innovation capability (Hsiao et al., 2011) 3) Loss of Direct Control (Hsiao et al., 2011).

5.3.4 Sub question four: What is best practice for service delivery in the health sector?

In order to improve the performance of health care services Bamford et al. (2008) indicated that it is possible to adopt best practices, tools and processes from other industries as long as they have proven useful. The use of Third Party Logistics Providers for the provision of logistics management is highly recommended (VanVactor, 2011). The importance of disciplined inventory management (Langabeer, 2005) for hospitals came to the forefront. There are already several strategies and techniques available that can be useful in the delivery of logistics services in the healthcare sector. They include the use of information technology (More & McGrath, 2002) (WWW, Materials Requirements Planning, EDI, ERP and e-procurement), Product standardization (Wagner, 2006), Contract compliance (Popiolek, 2006) and education of supply chain practice (Fawcett & Magnan, (2011). Care should, however, be taken about how information technology is managed. The objective of Information management should be to provide accurate information on the operations of the various logistics activities.

5.3.5 Sub question five: to investigate the role of MOHSS in Namibia

Regarding the role of the Ministry of Health and Social Service is it clear that there is a huge task on hand. The roles and responsibility of the Ministry are articulated in the Constitution of the Republic of Namibia. These roles refer to the promotion of the welfare of the Namibian People and the planning to raise and maintain an acceptable level of nutrition and standard of living of the Namibian people and to improve health. Partnership forming (3PL's) as a strategic intervention can be considered by management and this may assist the MoHSS to fulfil its roles and responsibility.

5.3.6 Main research question: What is the current status of the Ministry's logistics activities and can Third Party Logistics Providers (3Pl's) be used in logistics operations of the Ministry of the Ministry of Health and Social services?

This question was linked to the main research objective and was addressed through the revision of documents (secondary data) and survey questionnaire. The status of the logistics activities of the Ministry of Health and Social Services was determined through the survey questionnaire responses. The survey identified inventory management; transport management, warehousing management and information technology management as the areas of concern. Many of the logistics activities are manually operated and the non-use of technology was identified as a shortcoming.

In conclusion all the research questions were addressed in the research study.

5.4 Summary

This research emphasizes the importance of logistics, its activities and the use 3PL providers. It further contributes to a better understanding of logistics concepts, best practices, the benefits and disadvantages of both 3PL providers and in-house logistics services. The main purpose of the research was to investigate the status of the logistic units' activities and if 3PL providers can be used in the logistic operations of the MOHSS. The research was conducted on the basis of two sets of questions. The first set of sub questions was developed to review literature on logistics 3PL providers and MOHSS:

- What service logistic is?
- What is best practice in logistics services?
- What is best practice for service delivery in the health sector?
- What are the costs/benefits of using 3PL's compared with in-house service logistics?

- To investigate the role of MOHSS in Namibia.

The literature review addressed these questions and provided the opportunity to identify the six logistic activities (procurement, ordering, transport, warehousing, inventory and Information Technology). It also assisted to develop the conceptual framework.

The main question was as follows:

> What is the current status of the Ministry's logistics activities and can Third Party Logistics Providers (3PL's) be used in the logistics operations of the Ministry of Health and Social Services?

This main question was also addressed through the revision of documents (secondary data) and the questionnaire. The survey identified that inventory management; transport management, warehousing management and information technology management were the areas of concern. In conclusion four main identified areas can be summarized as follows:

1. **Best logistic practices implementation:** This is an area of concern which needs attention, especially with regards to the development of operational manuals and guidelines, integration of logistic activities, skills and knowledge in logistic systems, customer care, and response to the measures taken.
2. **Logistics Planning and Control:** The workers have a fairly good understanding with regards to Logistics Planning and Control. There are however some concerns with regard to product standardization, use of item master lists (currently use manual rather than electronic), how inventories are planned, quantities and quality verification of products.
3. **Technology Capacity and usage:** There is a great concern that most of the activities are still manually operated, the lack of IT systems, the training aspects of IT, the lack of knowledge of Web based systems, and communication is prominently done with letters and telephones.
4. **Other General Observations:** Outsourcing for some of the logistics activities is recommended. The results gave an indication that there are possibilities to outsource transport, warehousing, inventory and information technology activities.

6 Chapter 6: Conclusion and Recommendations

6.1 Introduction

This chapter discussed mainly the conclusions and recommendations drawn from the results of the survey. In addition, there are also sections which discuss the objectives a summary of the key findings, contribution of the study, recommendations for practice and future research. The chapter closes with a section on final remarks.

6.2 Objectives revisited

6.2.1 Objective 1: To review literature to explain the five sub questions.

Firstly, the first objective was to review the literature in relation to the five sub questions. The objective was achieved and provided the basis on which methodology and the conceptual framework were designed. Murphy & Wood (2008) indicated that there are twelve logistics activities, however only six of those activities are currently employed by the MOHSS in its logistics channel. Therefore, for this research only these six activities [1). Inventory, 2) Procurement, 3) Ordering, 4) Warehousing, 5) Transport and 6) Information Technology were investigated. Paragraphs 5.3.1 to 5.3.5 above provide a summary of the literature review outcomes on the five sub questions.

6.2.2 Objective 2: To investigate what the MOHSS current status of logistics and its activities are and whether 3PL providers can be used in the logistic operations of the MOHSS.

Secondly, the main and overall objective that was proposed was to investigate what the current status of the Ministry's logistics activities, and if 3PL providers can be used in the logistics operations of the MOHSS. This objective was linked to the main research question. This research concentrates only on the six activities and it was found that there are concerns with regards to four of those activities namely; [1). Inventory, 2). Warehousing, 3). Transport and 6). Information Technology. In addition the other two activities, 1) Procurement, and 2) Ordering are rated above average. However, in some areas there is room for improvement. The use of 3PL providers is recommended as an option in order to improve health services delivery.

6.2.3 Objective 3: To identify areas for improvement and as well as to suggest recommendations

The final objective was to identify areas for improvement and suggest recommendations. The results of this research clearly demonstrate that the following areas are the areas that need improvements:

- Communication is mostly done using telephones and writing of letters and memos.
- Delays in procurement activities, (order processing takes too long, manual operations, and lack of contract management);
- Manual operations in inventory, transport, warehousing and inventory (asset) management;
- Processes and systems not fully integrated;
- Lack of logistics specialists;
- Limited uses of operational guidelines and manuals for logistics;
- Limited use of technologies;
- A moderate use of data by management for decision making

The survey clearly illustrated that there are areas that need improvement as well as areas which are of concern. The two activities of the logistics units which were identified as more prominent having positive outcomesare:

1) Procurement
2) Ordering

The following other four activities were identified as areas of concern which need some interventions:

1) Transport
2) Warehousing
3) Inventory
4) Information Technology

Furthermore, many of these activities are done manually with a limited use of Information Technology or computerized systems. The last four activities were also identified as possible areas for outsourcing.

6.3 Summary of key findings

The key findings of this research can be summarized as follows:

- The health care system is complex and unique;
- Logistics service is an important component in the provision of health care services;

- ❖ Strategic interventions are required in the provision of logistic services in order to improve on service delivery;
- ❖ There is lack of Information technology and Web based systems for logistics activities;
- ❖ There is limited training for officials in best practices of logistics. There are no qualified Logisticians;
- ❖ Most of the systems in use are manually operated;
- ❖ There is an opportunity to make use of 3PL providers for some of the logistics activities to improve service delivery. Transport, warehousing, Information Technology and inventory have been identified as possible areas.

6.4 Contribution of the study

It is my opinion that this research contributed to aspects of logistics in health care service delivery, especially within the Namibian context. The review of literature suggests that there are many studies being done on the aspects of logistics services as well as the use of 3PL providers. However, in logistics of healthcare services in Namibia not much research has been done. This research highlighted the importance of integrating IT in logistics management. Literature further suggests that the use of 3PL providers can be useful because those logistics providers have the capabilities and resources to do so. Care should however be taken with the selection 3PL providers. There is no doubt that some of the experiences and lessons learned, especially with regards to best practices reflected in the literature review will be of benefit of other public entities. This will assist others in developing or re-organizing their logistics systems, which will result in improved organizational performance.

6.5 Recommendations for practice and future research

Based on the results and findings of the research the following recommendations for practices are made to the Ministry of Health and Social Services which runs an in-house logistics services. In addition areas for future research are also discussed

1. Recommendations

- The Ministry should make use of 3PL providers to provide logistics service in all or selected logistics activities. This will allow management to concentrate on the core function of the Ministry, which is the provision of health care services. Thus, improvements will be made to the secondary function. The latter refers to logistics service which may ultimately improve health care service delivery.

- The Ministry should move away from mainly manually operated logistics systems to integrated computerized systems. Benefits such as higher productivity of staff, cost saving, better quality products and services, better control and management of assets and inventories, improve customer care, improve supplier's relationship and improvement of the public perception of health care services can be realized. A flexible IT system needs to be developed to accommodate Web-based logistics information systems.
- The Ministry can train officials currently dealing with the logistics activities to become logisticians. This creates an opportunity for them to understand all the concepts, best practices of logistics and related activities. Shorter courses as well as attachments to private companies may also result in improvements.
- The Ministry should develop strategic interventions with regards to the provision of logistics activities.
- The core activity of the logistics function is inventory management, which should get special attention. The main objective of inventory management is to make the right quantity of the right products and services available at the right time. The other activities revolve around the management of the inventory function.

2. Future research areas

Areas for further possible research should focus on the following:

- Logistics of SME's (a story of success or failure) in Namibia
- Logistics of Public entities (a story of success or failure) in Namibia
- The importance of logistics in the Public Sector
- What determines the success of logistics in the Public Sector, A Namibian perspective
- The effects of Performance measures of logistics activities in the Public sector.

6.6 Final Remarks

Logistics and its activities play an important strategic role in the provision of service delivery. These activities should be integrated and the use of Information Technology can only be of benefit to service provision, especially in the health care services. The use of Third Party Logistics Providers is to be considered to overcome the challenges faced in the provision of health care services. The creation of a job category logisticians and the training of officials in the field of logistics may also benefit the Ministry of Health and Social Service and Namibia.

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Appendix- A Survey Questionnaire:

Logistics and 3PL Providers in Public Healthcare Sector

Background: The survey is done in the fulfilment of the requirements for the Degree of Masters in International Business (Polytechnic of Namibia). The main objective of the study is to look at the in-house capacity of logistics and which areas can be improved. Attached find also a written consent form to be completed by each participant. Please indicate the time spent on completion of the questionnaire at the end.

Part General information

5. **Please tell us about your Gender, work experience, and education.**

a) Gender

Male	O
Female	O

b) Working experience

Less than I year	O
More than 1 year but less than 3 years	O
More than 3 year but less than 5 years	O
More than 5 year	O

c) Education information

Grade 10	O
Grade 12	O
Certificate	O

Diploma (specify)_____

Degree(specify)_____

Others(specify)_____

6. **In which of the following settings are you working?**

Management	O
Supervisory	O
Operational	O

Part B- Best Logistic Practices used

For the purpose of this research "best practices" is defined as doing the right things right

7. **Please indicate if you use any guidelines and or manual**

Yes- use guidelines or manuals	O
No- do not use guidelines or manuals	O

If yes, please name the manuals and guidelines----------

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8. **In your opinion is it important to have the appropriate skills in the logistics systems.** (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Appropriate skills	1	2	3	4	5

9. **Please rate to what extend do you respond to any of the logistics measures captured:** (5= to a large extend, 4=to a moderate extend, 3= to some extend, 2=to little extend, 1= Not at all)

Action taken on logistics measures captured:	1	2	3	4	5

Logistics Planning & Control: For the purpose of this research the term "logistics" is defined as all planning, coordination and procurement necessary deliver on a product or a service.

For each of the statements, please indicate your level of agreement /disagreement by circling or crossing the appropriate number. (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

10. Procurement planning is essential for effective service delivery
11. Procurement control is essential for effective service delivery
12. Inventory planning should be done manually.
13. Inventory planning should be done scientifically.
14. When goods are delivered quantities are verified.
15. When goods are delivered, quality checks are done?
16. Products are delivered at the best prices?
17. Products are standardized?
18. Item Master lists are used in the hospital/directorate?
19. **Please rate (1-5) the following statement " I have the appropriate skills for each one of the following logistics activities:** (1= strongly disagree 2= disagree, 3= Neither agree Nor disagree, 4= Agree and 5=Strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

20. **Please rate (1-5) the following statement " I have appropriate knowledge on each one of the following logistics activities:** (1= strongly disagree 2= disagree, 3= Neither agree Nor disagree, 4= Agree and 5=Strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

21. **Please rate the statement "There is integration with regards to the following logistics activities" (**1= strongly disagree 2= disagree, 3= Neither agree Nor disagree, 4= Agree and 5=Strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

22. **Please rate the statement "Customers are satisfied with regards to the following activities?**

(1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=Strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

23. **IT Capacity & Usage: Please rate the following statement "management uses data for decision making in the following logistics activities?** (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5

Inventory	1	2	3	4	5

24. **Please rate the following statement" The following systems that are being used in logistics activities are computerized"** (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

25. **Please rate the following statement. "I am satisfied with IT systems in my working environment in relation to the following logistics activities"** (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

26. **In your opinion are the following systems are up to standard with regards to technology?**
(1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

27. **How often do you get training in Information technology?**

Annually	O
Monthly	O
Weekly	O
Daily	O
None of the above	O

28. **Please indicate which form of communication within the Supply Chain you are using when you are dealing with your stakeholders?**

Telephone calls	O
Internet (supply networks)	O
Letters, memo's	O

General Observations: "Third Party Logistics providers" is described as services providers that are doing logistics services on behalf of others. "Outsourcing" or "out contracting" refers to an activity be done by someone else.

29. **Please rate the following statement "there is a need to outsource the following logistics activities"** (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

30. **In your opinion do you agree that you are satisfied with the provision of service delivery in the logistics.** (1= strongly disagree 2= disagree, 3= neither agree Nor disagree, 4= Agree and 5=strongly agree)

Procurement	1	2	3	4	5
Transport	1	2	3	4	5
Warehousing	1	2	3	4	5
Information Technology	1	2	3	4	5
Ordering	1	2	3	4	5
Inventory	1	2	3	4	5

31. Overall, my institution (hospital)

delivers a good service to our clients	1	2	3	4	5

32. I have completed the questionnaire in_____ minutes approximately.

"Thank you very much for completing the questionnaire"

Appendix B Written Consent to be in the Survey

1) **Title**: The effectiveness of Third Party Logistics Providers in the Public Health Sector"
2) **Introduction:** The researcher is a student at the Polytechnic of Namibia and the research is a partial fulfilment of the requirements for the degree of Master in International Business in the Department of Business and Management in the Harold Pupkewitz Graduate School of Business. His selection for research is with regards to operations in the logistics channels and if indeed the use of third Party Logistics Providers can assist the Ministry to bring effectiveness. It is anticipated that the research will inform the researcher of lessons learned and to make recommendations. You are being asked to take part because you play a role in one the following:
    a. Buyer
    b. Supervisor
    c. System user
    d. Decision/Policy maker
3) **Review procedures**: What will happen if I participate?

    You will take part in one interview session with the researcher. The interview will take approximately 30 minutes to two hours, depending on your role. The interview will take part in a private location, if available. The issues to be discussed will be about the following in broad terms:
    a. To explain your role in the system;
    b. How the procurement/warehouse/transportation and information systems work;
    c. Your thoughts how these systems might be improved;
    d. What the systems need for ongoing;
    e. Your thoughts about training aspects;
    f. Your thoughts about outsourcing;
4) **Risks**: Are there any risks to me or my privacy?

    There is a very small chance that during the interview, you may feel uncomfortable answering some of the questions. You may skip any questions that you don't want to answer.
5) **Benefits**: Are there benefits?

    You will not directly benefit from taking part in this research. However, information obtained may help improve operations at your site.
6) **Confidentiality:**

All the information collected from you will be protected. If you decided not to participate in this research, your privacy will be protected and supervisors will not be informed of your decision regarding participation. Your name and job title will not be attached to your interview responses or mentioned in any reports of the results of the review. All data collected will be stored in a safe place both in paper or electronic forms. Only the researcher will have access to the data. All paper forms and individual data will be destroyed once the research is completed.

7) **Can I say "No"?**

Yes, you do not have to complete the interview

8) **Payments/Cost: Are there any payments or Costs:**

There are no costs to you for being part of the research. You will not receive anything for participating.

9) **Who can answer my questions about the study?**

You can talk to the supervisor of the student, Prof Whyte at +264 61 207 2809 about any questions, concerns, or complaints you have about this interview. Furthermore, if you have wished to ask questions about this review, or your rights as a participant to someone other than the researcher or if you wish to voice ant problems or concerns you may have about the research, please contact Mr. P. K Ndaitwa +264 61 2032028 MOHSS.

10) **DECLARATION OF CONSENT**

If you wish to be in this case study, please sign below:

_____	_____	_____
Date	**Participant's Signature for Consent**	**Initials and Surname**

_____	_____	_____
Date	**Person obtains Consent**	**Initials and Surname**