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**FACULTY OF COMMERCE  
DEPARTMENT OF ECONOMICS**

**TOPIC**

**THE IMPACT OF SUPPLY CHAIN RESILIENCE STRATEGIES  
ON SERVICE DELIVERY OF PRIVATE HOSPITALS IN HARARE PROVINCE.**

**RESEARCH PROJECT**

**BY**

**MANYANI IAN (B1850188)**

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**RELEASE FORM**

**NAME OF AUTHOR:** IAN MANYANI

**REGISTRATION NUMBER:** B1850188

**TITLE OF PROJECT:** THE IMPACT OF SUPPLY CHAIN RESILIENCE ON SERVICE DELIVERY OF PRIVATE HOSPITALS IN HARARE PROVINCE

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**PERMANENT ADDRESS:** 1292 CHARLOTTE BROOKE, BORROWDALE, HARARE

**DATE:** .....

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Signed .....

Date .....

Registration number: B1850188

Physical Address: 1292 CHARLOTTE BROOKE, BORROWDALE,  
HARARE

## **DEDICATION**

This research work is dedicated to my family; my lovely parents Mr Alexander S. Manyani and Mrs Gladys Manyani and siblings Ellah, Prisca, Joylyn, Phineas and Phillip Manyani for their unfaltering support. Because of them, this journey was a success. I greatly thank you.

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## ABSTRACT

Supply chain resilience strategies are regarded as critical in improving service delivery of healthcare institutions, in ensuring uninterrupted supply of medicines and medical equipment. Most hospitals have implemented supply chain resilience strategies in order to prevent deaths and provide adequate healthcare service delivery due to unavailability of medicines as a result of interrupted supply chains. Therefore, the intention of this study is to establish which supply chain resilience strategies are employed by private hospitals in Harare province and their effects on service delivery of the private hospitals in Harare province. This study employed a pragmatist research paradigm, a descriptive research design and a mixed research method approach. Primary data was collected through both questionnaires and interviews. A sample of 22 hospitals for questionnaires was drawn from a population of 23 private hospitals in Harare province. For interviews, respondents 5 hospitals were randomly picked out of the 22 private hospitals in Harare province and interviewed. Descriptive and inferential analysis was conducted to analyse quantitative data using Statistical Package for Social Sciences software, version 13. The analysed quantitative data was presented in tables, charts and figures. Qualitative data from interviews was analysed according to subjects evolving from objectives of this study and was presented in vignettes. The outcomes of this study shown a positive relationship between supply chain resilience strategies; collaboration, supply chain agility, supply chain reengineering and service delivery of private hospitals in Harare province. Following the above findings, this study concludes that supply chain resilience strategies have a positive effect on service delivery of private hospitals in Harare province, in terms of improving service delivery times, reduction of costs and increased client satisfaction. This study, therefore recommends private hospitals in Harare province to collaboration, supply chain agility and supply chain reengineering in improving service delivery. Finally, this study recommends that in future the study can be extended to other regions of the country for assessment purposes and should also be extended to other supply chain resilience strategies that affect service delivery.

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# CHAPTER I

## INTRODUCTION

### 1.1 Introduction

This study aims to evaluate the impacts of supply chain resilience strategies on service delivery of private hospitals in Harare province and identify supply chain resilience practices to make supply chain resilient. This chapter covers the background of the study, statement of the problem, the purpose of the research, objectives, and research questions, significance of the study, assumptions, limitations, and delimitation of this study.

### 1.2 Background of the study

Globally, the business environment is facing high levels of uncertainty and complexity that make organizations' supply chains vulnerable to supply chain disruptions (Fan et al., 2016). High-profile events such as natural disasters, political turmoil, diseases, and terrorism have disrupted the normal daily business operations of healthcare institutions leading to poor service delivery (Chen et al., 2013; Sawik, 2018). Six million children around the world die yearly due to inadequate provision of service delivery (UNDP, 2016). Recently, COVID-19 has altered and changed the delivery of and also access to healthcare facilities across the world, leading people to fail to get adequate health service delivery. This has been witnessed by many healthcare providers resorting to telephone health and avoiding office visits to serve patients directly due to failure to get personal protective equipment, some medications, disinfection, and hygiene product (Paul and Chowdhury, 2020, Amankwah-Amoah, 2020). Due to the ongoing pandemic, some health supply chains may continue to experience critical shortfalls. The COVID-19 pandemic has had an overwhelming human impact and exerted unrelenting pressure on pharmaceutical and healthcare

supply chains. One study by Dun and Bradstreet showed that 51000 companies worldwide, 163 of which are in the Fortune 1000, have one or more direct or tier 1 suppliers in the impacted Wuhan, China region (Smith, 2020). Additionally, distinct from the aforementioned outbreaks, this pandemic has wedged all the nodes (supply chain associates) and edges (ties) in a supply chain simultaneously (Gunessee and Subramanian, 2020, Paul and Chowdhury, 2020).

The accomplishment of adequate provision of service delivery is reliant on the capability of hospitals to encourage resilience and mitigate against risks and threats through the support of dynamic proficiencies that reduce the negative impact of supply chain disturbances and increase service delivery (Krishnan and Pertheban, 2017). Resilience is a multi-faceted dynamic capability meaning that resilience acts as the dynamic competence by which businesses integrate, shape, and reconfigure internal and external capabilities that can withstand firm performance (Eltantawy, 2016). Managing disruptions from supply chain threats have therefore gained great interest in the supply chain management field (Hohenstein et al., 2015). As a result, attention has focused on supply chain resilience strategies and how they impact service delivery.

The first widespread exploration on supply chain resilience started in the United Kingdom, following transport disruptions from fuel protests in 2000 and the outbreak of the Foot and Mouth Disease in early 2001 (Pettit *et al.*, 2010). These studies discovered that service delivery can be improved through building robust supply chain resilience strategies. Supply chain risks are unexpected events that disturb the normal flow of materials and goods within an organization's supply chain (Craighead et al., 2007). Although these events are unpredictable, they are very common in the current business environment. The Allianz Global Corporate and Specialty (AGCS) propagates that the average amount of large business disturbance claims between 2010 and 2014 was greater than \$2 million and escalating every year, which is 36% greater than the equivalent average loss due to property damage (AGCS, 2015). However, through supply chain resilience organizations can manage disruptions and lower the risk of losses hence improvement in service delivery. WHO (2015), states that one million people in Africa die each year from AIDS-related illnesses. Most of these deaths can be prevented if there remains a smooth flow in the movement, distribution, and supply of medicines to hospital pharmacies. Hospitals are beginning to recognize that adopting supply chain resilience strategies in the supply chain is a critical component in ensuring an uninterrupted supply of medicines.



Therefore, the universal supply chain risks and market disruptions that are affecting health care institutions' service delivery are at an unprecedented high. Business leaders around the world agree that modernization and major changes to their supply chain strategies will be necessary if they hope to be more resilient and competitive in the current market.

Therefore, the need for more research on the phenomenon of SCRES has been emphasized in the supply chain management literature (Pereira et al., 2014; Ambulkar et al., 2015; Hohenstein et al., 2015; Kim et al., 2015a; Scholten and Schilder, 2015), but to date, only a few empirical studies on supply chain resilience have been reported in the literature and few studies focus on the improvement of supply chain resilience in the healthcare industry. Further, there is evidence of limited use of philosophy frames to improve our understanding of supply chain resilience. This research will bridge the gap by evaluating the impacts of supply chain resilience strategies on service delivery of private hospitals in Harare province.

### **1.3 Problem statement**

The increased occurrence and the critical effects of past supply chain disruptions in the global world have made many healthcare providers struggle in constructing a health system that can effectively and efficiently provide adequate health services to people. Six million children around the world die yearly due to inadequate provision of service delivery (UNDP, 2016). Recently, the COVID-19 pandemic has altered and changed the delivery of and access to healthcare facilities across the world-leading people fail to get adequate health service delivery (Paul and Chowdhury, 2020; Amankwah-Amoah, 2020). This is due to many healthcare supply chains experiencing critical shortfalls in the supply and delivery of personal protective equipment, some medications, disinfection, and hygiene product. These shortfalls can be managed by creating agile and resilient supply chains. The World Health Organization (2015) stipulates that over one million people in Africa die each year from AIDS-related illnesses due to inadequate provision of health services. Most of these deaths can be prevented if there remains a smooth flow in the movement, distribution, and supply of medicines in hospital pharmacies to improve service delivery. Hospitals are beginning to realize that adopting supply chain resilience strategies in the supply chain is a critical component in ensuring an uninterrupted supply of medicines. It is believed that the initiative to adopt supply chain resilience strategies help in creating an effective supply chain system to improve service delivery (Gurnani, Ray, and Yunzeng, 2011) and secure continued

access to life-saving treatment (UNAIDS, 2014). This has also led the MOHCW of Zimbabwe in collaboration with UNDP to create an effective medicine supply chain system to improve service delivery (WHO, 2015). Therefore, this research seeks to evaluate the impacts of supply chain resilience strategies on service delivery of private hospitals in Harare province.

#### **1.4 Purpose of the study**

The main aim of this study is to evaluate the impacts of supply chain resilience strategies on service delivery of private hospitals in Harare province. The reason is to find a solution to reduce the impact of risks in the supply chain on healthcare business service delivery.

#### **1.5 Research objectives**

This study seeks to achieve the following objectives:

- To determine the effect of collaboration on service delivery of private hospitals in Harare province.
- To establish the influence of supply chain reengineering on service delivery of private hospitals in Harare province.
- To assess the effect of agility on service delivery of private hospitals in Harare province.

#### **1.6 Research questions**

The research seeks answers to the following research questions:

- What is the effect of collaboration on service delivery of private hospitals in Harare province?
- What is the influence of supply chain reengineering on service delivery of private hospitals in Harare province?
- What is the effect of agility on service delivery of private hospitals in Harare province?

## **1.7 Significance of the Study**

This research will be of significance to the stakeholders:

### **1.7.1 Academia**

The research is expected to contribute to the body of knowledge particularly on the impacts of supply chain resilience strategies on service delivery and can be kept in the University's repository library as literature for view in the future by other researchers who may wish to undertake researches on similar topics.

### **1.7.2 Practitioners**

This research is very significant to practitioners because the outcomes will enable them to mitigate risks and reduce costs from adopting supply chain resilience strategies. They will be able to minimize disruptions and raise their service delivery levels. This helps them to improve service delivery to the clients.

### **1.7.3 Policy Makers**

The Government of Zimbabwe as a policymaker will also be interested in the outcomes of the study. Policies on e-procurement will then need to be crafted, or enhanced depending on the results of the study.

## **1.8 Assumptions**

The researcher made the following assumptions:

- That the respondents provided true and accurate information.
- That all respondents to the questionnaire and interviews have sufficient knowledge on the issues of supply chain resilience strategies and service delivery of private hospitals in Harare province.
- That the research environment will remain conducive to research under the given time frame.

## 1.9 Delimitations of the study

The study population was confined to private hospitals in Harare province. The study will evaluate the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province.

## 1.10 Limitations

The following are limitations, which could bind the generalizability of the research results:

- The study needs funding to collect information; therefore the financial limit could constrain the sample. However, the student will strategize well in advance on the mobilization of finance.
- The study will be carried out in a limited space of time, hence the student will be focusing on key result areas of the study
- The study will cover some complex questions but the participants will be warned and ensured of their privacy and confidentiality.
- Some respondents will fail to understand the significance of this study but the student will spring a clear description highlighting the significance of the study.

## 1.11 Definitions of the terms

Key terms to be used in this study are clarified below:

**Supply chain resilience:** Supply chain resilience is defined supply chain resilience as the adaptive competence of the supply chain to prepare for unanticipated events, respond to interruptions and recover from them by upholding continuousness of operations at the desired level of connectedness and control over structure and function (Ponomarov and Holcomb, 2009).

**Service delivery:** Service delivery refers to the firm's ability to serve and produce what the market requires at a particular time and efficiently (Grassing, 2002).

**Strategy:** Strategy is a process of consolidating, decision-making, and scope of an organization to align different antecedents in various challenging environments to meet the needs of markets, fulfill stakeholder expectations and achieve results (Grötsch, Blome, and Schleper, 2013).

**Supply Chain Risk:** Supply chain risk is defined as an unintended and unexpected incident that disturbs the flow of goods or services within the supply chain (Scholten, Stevenson, and Van Donk, 2019).

**Risk mitigation:** Risk mitigation is the level of exposure to uncertainties that leaders must comprehend and effectively manage with strategies to achieve business objectives and generate value (Diabat, Govindan and Panicker, 2012).

### 1.12 Abbreviations

<b>ACRONYM</b>	<b>MEANING</b>
MOHCW	Ministry Of Health And Child Welfare
UNAIDS	United Nations Aids Organization
UNDP	United Nations Development Program
SC	Supply Chain
SCM	Supply Chain Management
SCRM	Supply Risk Chain Management
SCRES	Supply Chain Resilience
WHO	World Health Organization
WTO	World Trade Organization

### 1.13 Organization of the study

This section provides an outline of this research, which is divided into five chapters and organized as below:

**Chapter 1:** This chapter is the introduction of this research. It provides the background of the study, research objectives, and questions. It also provides for justification, assumptions and limitations of the study.

**Chapter 2:** This chapter reviews literature in the field of supplier development. It also provides empirical evidence on similar research done on the effects of supplier development on supplier performance. Analysis of empirical evidence is important to reveal research gaps from previous studies.

**Chapter 3:** This chapter covers the research methodology used in this research to gather data. It

also covers aspects such as research design, sampling procedure, research instruments, and data analysis.

**Chapter 4:** This chapter covers data presentation, analysis, and discussion. Tables and figures are being used for quantitative data and interviews will be presented as quoted verbatim.

**Chapter 5:** This chapter provides for summary, conclusion, and recommendations of this study. It also concludes this research.

### **1.14 Chapter Summary**

The main aim of this study is to evaluate the impacts of supply chain resilience strategies on service delivery of private hospitals in Harare province. This chapter covers the background of the study, statement of the problem, the purpose of the research, objectives, and research questions, significance of the study, assumptions, limitations, and delimitation of this study. The next chapter presents an outline of the literature which underpins the study.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter reviews the existing literature scrutinized by other researchers. The information was obtained from publications, theoretical frameworks, empirical evidence, textbooks, and journals that had information that related to the study. The major reason is to establish the knowledge gap between what has been researched and what the researcher will come up with or what the researcher is focusing on. This chapter aimed to give a critical evaluation of the present study evidence about supply chain resilience strategies and their effect on service delivery of private hospitals in Harare province. It also highlights theories of supply chain resilience. The chapter also covers the conceptual framework of this research.

#### **2.2. Theoretical framework**

Theoretical framework is the structure that support a theory of this research study. The theoretical framework introduces and describes the theory that explains and indicate variables and relationships relevant to this study. Theories are formulated to explain, predict, and understand phenomena and, to challenge and extend existing knowledge within the limits of critical bounding assumptions. It is also important in explaining the observed facts and predicting outcomes of relationships.

## **2.3 Theories of Supply Chain Resilience**

Various theories explain the rationale for supply chain resilience. These theories and views are proposed by several authors to have the potential for explaining various aspects of SCRES. The study will be informed by the Strategic Choice Theory and Resource-Based Theory.

### **2.3.1 Strategic Choice Theory (SCT)**

According to Strategic Choice Theory, there exists a link between choices undertaken by the top management team and the performance of the business. Actions of identifying, evaluating mitigating, and monitoring unexpected events or conditions determine the overall performance of an organization. These actions that management of organizations undertaken entails supply chain resilience (Ponomarov and Holcomb, 2009). The theory looks at the interaction of the actions of an organization and events (De Rond and Thietart, 2007). An integrative approach of the Strategic Choice Theory is important in risk management. For example, emphasizing cross-functional integration in organizations (Touboulic and Walker, 2015). The Strategic choice theory represents the relationship between risk management, choices, and organizational performance and the environmental, organizational interaction. It stresses the importance of managerial risk management options and practices (Huang et al., 2016). It views organizations as partly influenced by their environment and affected by the choices they make to control environmental disturbances. The theory further suggests that managers play a substantial role in producing organizational performance by making decisions or leading organizational changes (Ketchen and Hult, 2007). This study is tailored to the SCT because managers play a significant role in attaining organizational agility through their decision-making (Scholten et al., 2014).

### **2.3.2 Resource-Based View (RBV)**

Resource-Based Theory argues that firms use resources to gain competitive advantage and thus performance (Ahuja, 2000). Risk identification, evaluation, mitigation, and monitoring require an organization to have certain resources in terms of best practices, technology, and concept to easily curb the risks in the organization which is best explained by this Resource-Based Theory.

The focus of this theory is on the organization's competitive advantages generated by its unique set of resources. Clulow et al. (2007) stress that; vital resources have been recognized as tangible



assets or intangible. Tangible assets are made up of bundles of resources in an organization that one can feel and touch. Intangible resources can neither be touched nor felt, they are created by managers and staff of an organization. They include things like reputation, brand names, the knowledge base of employees gained through experience, intellectual property of the company like trademarks, copyrights, and patents (Montgomery, 2011). The most important characteristic of the RBV is the focus on the internal forces of a firm which gives the firm a competitive edge over its competitors. The resources of the firm can be classified according to the following categories: capabilities, location resources, tangible and intangible resources, strategic resources, assets, human resources, technological resources, risk management resources, social resources, and organizational resources.

This theory noted that firms compete based on their uniqueness in terms of corporate resources available to them and how they manage the turbulence of the risk in the environment. These corporate resources should be rare to be found and difficult to imitate or substitute. This is a clear way of gaining a competitive advantage and influencing the service delivery of the firm (Holland, 2004). One of the assumptions of a resource-based theory is that resources are distributed in a heterogeneous manner. The theory also assumes that resources are not perfectly mobile. The theory leverages resources that are within an organization for the formulation of strategies especially those mitigating the risks in the organization. Through this, competitiveness and high performance are achieved and improve service delivery. Resource-based view theory (RBV) advocates mitigating disruptions with proper utilization of organizational resources and capabilities (Barney, 2001). RBV is useful for this study, as resources play a vibrant role in improving organizations' service delivery.

### **2.3.3 Network theory**

The network theory was first established between the 1970s and the 1980s with researchers concentrating on relationships between two entities, or tactical associations, towards an approach that entailed numerous relationships between diverse supply chain members (Wellenbrock, 2013). Lysons and Farrington (2006) defined a network as an array of partnerships, strategic alliances, and outsourcing that organizations form with suppliers, producers, and traders to produce and market a product. McNichols and Brennan (2006), note that network theory concentrates on both dyadic relationships and cooperative relationships. Network theory emphasis was on developing

durable and close relationships among the supply chain members through partnership, strategic alliance, and outsourcing (Gunasekaran, et al., 2008). The theory is suitable to the study since Networks allow healthcare institutions to consolidate resources for long-term commitments, cut costs and improve quality without huge expenditures that characterize investing in particular resources.

## **2.4 Supply Chain Resilience**

A supply chain comprises the suppliers, organization and consumers, and other partners engaged in the operations of the firm. In supply chain resilience, therefore, functions and practices that will ensure anticipation, resistance, recovery, and response strategies to the foreseen and unforeseen risks in the operations of the upstream, downstream, and producing firms. Reengineering, collaboration, agility, and risk mitigation culture in the supply chain are the key elements of supply chain resilience (Christopher et.al, 2004). They are facilitated by organizational relationship linkages and information integration (Lee, 2012).

Supply chain resilience results in high responsiveness to customers' demands, reduction in cycle time, transaction visibility, reduction in operational costs, and increased quality customer service delivery levels (Bargchi and Larsen, 2002). All these results in high operational and firms' performance of the supply chain players and increases service delivery. Supply chain resilience aims at unifying the organizations' skills, ideas and culture, thus enhancing decision making and reducing the conflict of interest, risks, and cost implications imposed on the firm while at the same time enhancing greater customer value through systematic and frequent measurement of customer satisfaction and monitor the commitment of customers' needs (Li et al., 2017).

According to Forkmann, Varzandeh, Henneberg, Naude, Mitrega (2016), organizations are becoming increasingly forewarned on disruptions caused by the supply chain. Today, supply chain resilience is a key component of global firms and economies. Organizations are therefore developing supply chain resilience strategies to manage the risks facing firms as a result of technology, uncertain global customers, and complexity in the supply chain function to remain competitive in the current dynamic marketplace.

## **2.5 Supply Chain Resilience Strategies**

According to Yang et al. (2009), companies need to be able to anticipate and prepare for possible future disturbances. To reduce risk and disruption vulnerability to improve service delivery, the members of a supply chain must be in a position to proactively anticipate different scenarios and implement reliable solutions and strategies that prevent their supply chains from the negative effects in the future (Hendricks, Singhal and Zhang, 2009; Zsidisin and Wagner, 2010). Thus the strategies fostering these competencies are essential factors of resilient supply chains to improve customer service delivery.

Maria Jesus Saenz et al. (2015) propose that supply chain resilience is categorized into three phases which are preparedness (state of being fully prepared for and disruption the supply chain), response (the ability to react to disruption), and recovery (return to the original state after a disruption). Several resilience strategies were discussed in this study but the researcher mainly focused on collaboration, agility, and supply chain reengineering strategies as they foster the three phases of supply chain resilience. For example, response requires an agile supply chain to quickly react and rectify disruptions; preparedness needs collaboration within the supply chain, and recovery requires the reconstruction and reengineering of the supply chains.

### **2.5.1 Supply chain reengineering**

Supply chain reengineering refers to the integrated perspective in the process of supply chain design with the traditional constraints, cost optimization, and customer service to enhance flexibility through customization in different situations (Santos et al., 2014). Supply chain reengineering involves a clear understanding of the supply chain partners and their functions, a flexible supply chain base through identification of supplier risk sources and assessment of the current strategies, and re-evaluation of the redundancy and efficiency trade-offs (Liker, 2004).

Literature discloses innumerable supply chain reengineering practices that can improve SCRES. These practices include postponement, flexible transportation, a flexible supply base, order fulfillment flexibility, and flexible labor arrangements (Tang, 2006b; Christopher and Holweg, 2011; Pettit et al., 2013). For instance, it is debated that flexibility through postponement boosts resilience during a crisis by deferring demand to the forthcoming period (Tang, 2006b). Accordingly, flexibility builds SCRES by improving speedy adaptability during turbulence

(Christopher and Holweg, 2011). Flexibility also supports a supply chain's prompt response and recovery, and this can be expedited by the convenience of choices (redundancy), comprising alternate suppliers (Sheffi and Rice, 2005). This empowers resources to be more easily redistributed, including shipping and labor resources (Pettit et al., 2013). More generally, supply chain reengineering is necessary given that threats to resilience are non-stationary, requiring responses that are similarly adaptive.

### **2.5.2 Collaboration**

Collaboration refers to a continuous relationship between suppliers and an organization. It helps organizations to influence their planned and operational efficiencies and capabilities. It emphasizes long-term direct relationships between firms and their suppliers with shared problem solving and planning capabilities (Li et al., 2006). Partnering describes numerous relationships. According to Pettit et al. (2013), supply chain collaboration refers to the ability to work effectively with other entities for mutual benefit in areas such as forecasting, postponement, and risk-sharing. Collaboration can also encompass information exchange, which can lessen uncertainty, upturn transparency, and help the creation and sharing of knowledge, such as about supply chain threats and uncertainties (Christopher and Peck, 2004). Wieland and Wallenburg (2013) note that relationships between supply chain members rely on the availability of information that is visible to the actors along the supply chain. Collaboration also enables supply chain partners to share the costs of building security and resilience (Bakshi and Kleindorfer, 2009).

Moreover, it influences the processes adopted by supply chain partners to ensure supply chain recovery (Ghadge et al., 2012). For example, collaboration can facilitate the sharing of resources and other complementary skills necessary for recovery from a disruption (Scholten et al., 2014; Scholten and Schilder, 2015). Collaboration also enhances SCRES by enabling supply chain partners to support each other during a disruptive event (Jüttner and Maklan, 2011) and to provide a flexible and coordinated response. For example, Toyota's collaboration with suppliers following the 1997 Aisin Seiki Kariya plant fire (Nishiguchi and Beaudet, 1998). This example is also useful in reminding us how certain practices in supply chain relationships, like just-in-time supply and single-sourcing supply partnerships create vulnerabilities that must be traded off against the benefits of these practices, like strong networks that could potentially facilitate a rapid response to a crisis. But such collaboration can also produce fragility, for example, in making social

commitments that have to be honored even when counter-productive. This was evident in the findings of this study where firms could be requested to wait patiently in case of supplier delivery delays and failures limiting flexibility to switch suppliers and affecting the downstream by similarly delaying delivery to customers.

### **2.5.3 Agility**

Being reactive is an increasingly vital skill for firms in today's global economy; thus firms must be agile (Swafford et al. 2008). Organizational agility is a proactive management strategy that targets prompt response to different markets, safeguarding the organization's resources successfully, and attaining the requirements of customers in a suitable manner that influences on firm's service delivery (Gligor et al., 2015). According to Wieland and Wallenburg (2013), supply chain agility refers to the firm's capability to rapidly adjust its supply chain strategies and processes. Agility is also an aspect closely tangled with the efficacy of strategic supply chain management. Agility has also been defined by Swafford et al. (2008) as the ability to cope with unexpected challenges, to survive unprecedented threats of the business environment, and to take advantage of changes as opportunities. Therefore, agility implies the use of knowledge of the market and a virtual corporation to harness profitable opportunities in volatile markets (Mason, Naylor, and Towill, 2000). It is a business-wide capacity that works with organizational structures, information systems, logistical processes, and risk mitigation practices (Christopher and Towill, 2001). The effectiveness of any ability to respond quickly to the market dynamics will be to a large extent be determined by the capabilities of trading parties. Therefore, the concept of agility has to be extended beyond the individual organizations to include the operations of the supply chain in which the firm operates (Power, Sohal, and Rahman, 2001). The rationale of an agile supply chain is the ability to respond quickly and efficiently to a dynamic marketplace.

Christopher and Peck (2004) suggested that supply chain agility is mainly composed of visibility and velocity. Supply chain visibility refers to the ability to see through the entire supply chain. It enables a clear view of the whole chain, which may help in detecting signals of impending disruptions. Visibility implies having knowledge of the status of a supply chain's assets and environment (Pettit et al., 2013), thereby also helping to avoid overreactions, unnecessary interventions, and ineffective decisions in circumstances of risk (Christopher and Lee, 2004). Furthermore, it helps the supply chain to effectively respond to and recover from disruptions

through, for example, identifying vulnerable suppliers, thereby allowing enough time to develop countermeasures against potential failures (Jüttner and Maklan, 2011). For example, Procter and Gamble's planners have tried to strengthen their supply chain visibility by installing monitoring tools to map the supply chain to improve threat awareness and receive timely warnings of potential disruptions (Saenz and Revilla, 2014).

Saenz and Revilla (2014) further describe how supply chain visibility helped Cisco to improve its agility and resilience to the Japanese earthquake and tsunami of 2011. Within twelve hours of the disaster, Cisco was able to map out its supply base beyond tier-one suppliers (more than 300 suppliers) and within twenty-four hours, it was able to trace its customers and field 118 customer inquiries hence improved service delivery. This helped it to build a firm SCRES agenda and survive the effects of the disaster (Saenz and Revilla, 2014). The second element of agility referred to by Christopher and Peck (2004) as supply chain velocity focuses on the pace of flexible adaptations (Stevenson and Spring, 2007), and thus determines the recovery speed of the supply chain from a risk event (Jüttner and Maklan, 2011).

#### **2.5.4 Strong corporate culture development**

The development of strong corporate culture as a resilient strategy helps all employees be well informed about the organization's activities and objectives through continuous communication. Corporate culture is like the DNA of an organization. With strong corporate culture, employees and management understand what is required of them and act by the core values and objectives of the organization. This will help and enhance the risk mitigation process. Employees are also empowered to make quick decisions. Supply chain disruptions such as natural disasters, pandemics, and other forms of disturbances require quick responses to get rid of the risks. Therefore, strong corporate culture development assists in improving employee engagement in risk mitigation programs. Strong corporate culture development also allows quick recovery after disruptions.

#### **2.5.5 Redundancy**

Redundancy refers to backup or alternative suppliers and the amount of time it takes for an organization to switch between suppliers following a disruption. As witnessed by many authors, disruptions to single and sole source global manufacturers can contribute to widespread shortages

of critical products. For instance, the 2011 Tohoku earthquake in Japan damaged the primary production facility for the specialty pigment Zirallic, which led to a global shortfall of a paint additive used by Ford, Volkswagen, BMW, Toyota, and several other auto manufacturers. Therefore, redundancy is vital to be able to quickly respond and manage disruptions. Through redundancy, an organization can hold extra inventory, maintain low capacity utilization, and have many suppliers and keep. However, redundant strategies add costs to operations (Sheffi and Rice, 2005) as it is temporary and an organization can fail to mitigate risks in the long term or extended risks. These strategies achieve resilience and reduce the overall supply chain risk (Tang, 2008). Christopher and Peck (2004) argue that opting for supply chain resilience strategies that leave several options open may be more expensive for a company in the short term than lean and efficient practices but reduce the likelihood and impact of disruptions and therefore payout in the long-term.

## **2.6 Service delivery**

Service delivery is a business framework that supplies services from a provider to a client. It includes the constant interaction between two parties during the duration of the time in which the provider supplies the service and the customer purchases it. So, Service delivery is taken to be the function of an organization's ability to meet its goals and objectives by exploiting the available resources efficiently and effectively. Service delivery entails effectiveness which refers to the firm's ability to serve and bring what the market requires at a particular time and efficiency means meeting the objectives at the lowest possible cost with the highest possible benefits (Grassing, 2002). In this case, service delivery is the part of a healthcare system where patients receive the treatment and supplies they are entitled to. To assess service delivery, managers use action designed to generate suitable long-term improvement.

The effectiveness of services is satisfied with effective service delivery by a particular organization. The effectiveness of service delivery is measured in terms of quality services that satisfy clients thus attaining the goals of the organization. Supply chain resilience strategies are used as a strategic tool to enhance the quality of services and are thus central to the delivery of services. Improving service delivery is one of the biggest challenges for many healthcare institutions. Private hospitals in Harare province are facing pressure to deliver more effective and

efficient health services to citizens despite the multitude of socio-economic and global challenges that it is facing. Therefore, this study will focus on the superiority of service delivery.

## **2.7 Metrics of service delivery**

Metrics help organizations improve service performance, align goals, and realize value. Some of the good things about having a measurement program are that it provides the instrumentation necessary to control a service organization and improve service delivery. It verifies results and brings attention to specific service performance issues, it makes it easier to spot danger in time to correct it before your customer gets upset, and it drives service delivery efficiency, effectiveness, and quality. Without a measurement program, unscrupulous things can happen, including reduced visibility resulting in loss of control and unpredictable service delivery. These outcomes can, in turn, result in negative customer perceptions, especially when cost effectiveness, service levels, and quality of service are poorly understood, leading to disagreements in value perception and situations where customer complaints drive improvements, forming an unhealthy negative feedback loop. There are various ways to measure service delivery within an organization (in this case hospitals). Service delivery measures include customer satisfaction, accessibility of service, quality of service and responsiveness or timeliness of service. Focusing on these metrics can give a broader understanding of the scope of service delivery.

### **2.7.1 Customer satisfaction**

Service delivery can be measured through customer satisfaction. Customer satisfaction is a measurement that determines how happy customers are with a company's products, services, and capabilities. Customer satisfaction information, including surveys and ratings, can help a company determine how to best improve or changes its products and services. An organization's main focus must be to satisfy its customers. This applies to industrial firms, retail and wholesale businesses, government bodies, service companies, nonprofit organizations, and every subgroup within an organization.

### **2.7.2 Accessibility of service**

Accessible service is an aspect of quality service and of creating a good service experience for customers. A quality service provides a response to customer needs. Service accessibility also



entails the number of clients who are able to get or access or assisted with a certain type of service. Service accessibility can be used as a measure of service delivery within healthcare institutions.

### **2.7.3 Quality of service**

Service quality is generally viewed as the output of the service delivery system, especially in the case of pure service systems. Moreover, service quality is linked to consumer satisfaction. Service quality is a perception of the customer. Customers, however, form opinions about service quality not just from a single reference but from a host of contributing factors. Quality of service is the description or measurement of the overall performance of a service. Therefore, quality is used to measure service delivery.

### **2.7.4 Responsiveness or timeliness of service**

Responsiveness is a service delivery measure which entails the degree to which individuals are inhibited or facilitated in their ability to gain entry to and to receive care and services from the health care system. The clients have to receive the service they require on time (timely service). Therefore, the rate at which customers are served can be used as a service delivery measure.

## **2.8 Supply chain resilience and service delivery**

### **2.8.1 Effects of Agility on service delivery**

If a disruption has occurred at some point of the supply chain, agility ensures an adequate response and adaptation to the disturbances and enables a supply chain to start the recovery as soon as possible (Hohenstein et al., 2015) to improve on service delivery. Rapid response to disturbance allows a supply chain to quickly recover and can reduce the total negative effects of a disruption considerably (Manuj and Mentzer, 2008). The more time a company needs to react and carry out its countermeasures, the longer disruption may exert negative impacts on the supply chain and service delivery will be compromised. Furthermore, Blackhurst et al. (2008) highlight the positive effect the agile components of resilient competencies have on service delivery by considerably reducing the recovery time after a disturbance occurred in the supply chain. Thus it is theorized that the agile strategy of resilience supply chain contributes to service delivery in a positive way.

### **2.8.2 Effects of collaboration on service delivery**

Supply chain collaboration teams up partners for competitiveness through information exchange, mutual decision making, and distributing rewards obtained by meeting the needs of clients with superior services amongst themselves (Simatupang and Sridharan, 2008). Slack and Lewis (2011) assert that collaboration is considered a strategic alliance, where skills and resources are shared to attain mutual benefits which cannot be realized working individually. Therefore, Fawcett et al. (2012) argue that collaboration is a vital supply chain resilience strategy to assist in delivering adequate services to customers or clients.

Collaboration has been employed by corporates by tapping into business partnership complementarities, knowledge management and information sharing, collaborative coordination, and partnership expertise among other prerequisites of strategic collaboration to increase service delivery. In a situation of disaster or pandemic (the recent being covid-19), collaboration keep supply chain organizations together and increase improvement on service delivery. According to Hsieh (2018), risk can be mitigated by collaborative work across supply chains.

### **2.8.3 Effects of supply chain reengineering on service delivery**

A supply chain requires re-engineering to make it more resilient. Once a supply chain is resilient it helps entities in delivering adequate services to clients. To make a supply chain resilient, there must be a proper understanding of supply chain network design (Choi and Hong, 2002). As mentioned above, literature discloses innumerable supply chain reengineering practices that can improve SCRES. These practices include postponement, flexible transportation, a flexible supply base, order fulfillment flexibility, and flexible labor arrangements (Tang, 2006b; Christopher and Holweg, 2011; Pettit et al., 2013).

Therefore, flexibility through postponement boosts resilience during a crisis by deferring demand to the forthcoming period (Tang, 2006b) and improving service delivery. Accordingly, flexibility builds SCRES by improving speedy adaptability during turbulence (Christopher and Holweg, 2011) hence this results in the provision of adequate service delivery to clients. Flexibility also supports a supply chain's prompt response and recovery, and this can be expedited by the convenience of choices (redundancy), comprising alternate suppliers (Sheffi and Rice, 2005).

Alternate suppliers are very crucial in times of shortage. Therefore, an organization will have a backup supply source and reduce operational stoppages hence improvement on service delivery.

#### **2.8.4 Effects of strong corporate culture development on service delivery**

The development of strong corporate culture as a resilient strategy helps all employees to be well informed about the organization's activities and objectives through continuous communication for example goals for increasing customer service delivery. Employees are also empowered to make quick decisions. Supply chain disruptions such as natural disasters, pandemics, and other forms of disturbances require quick responses to get rid of the risks. This is so because if left unnoticed they cause supply chain disturbances including shortages which result in poor service delivery. Therefore, strong corporate culture development assists in coming up with quick responses through prompt strategic decisions. Strong corporate culture development allows quick recovery after disruptions hence service delivery can increase.

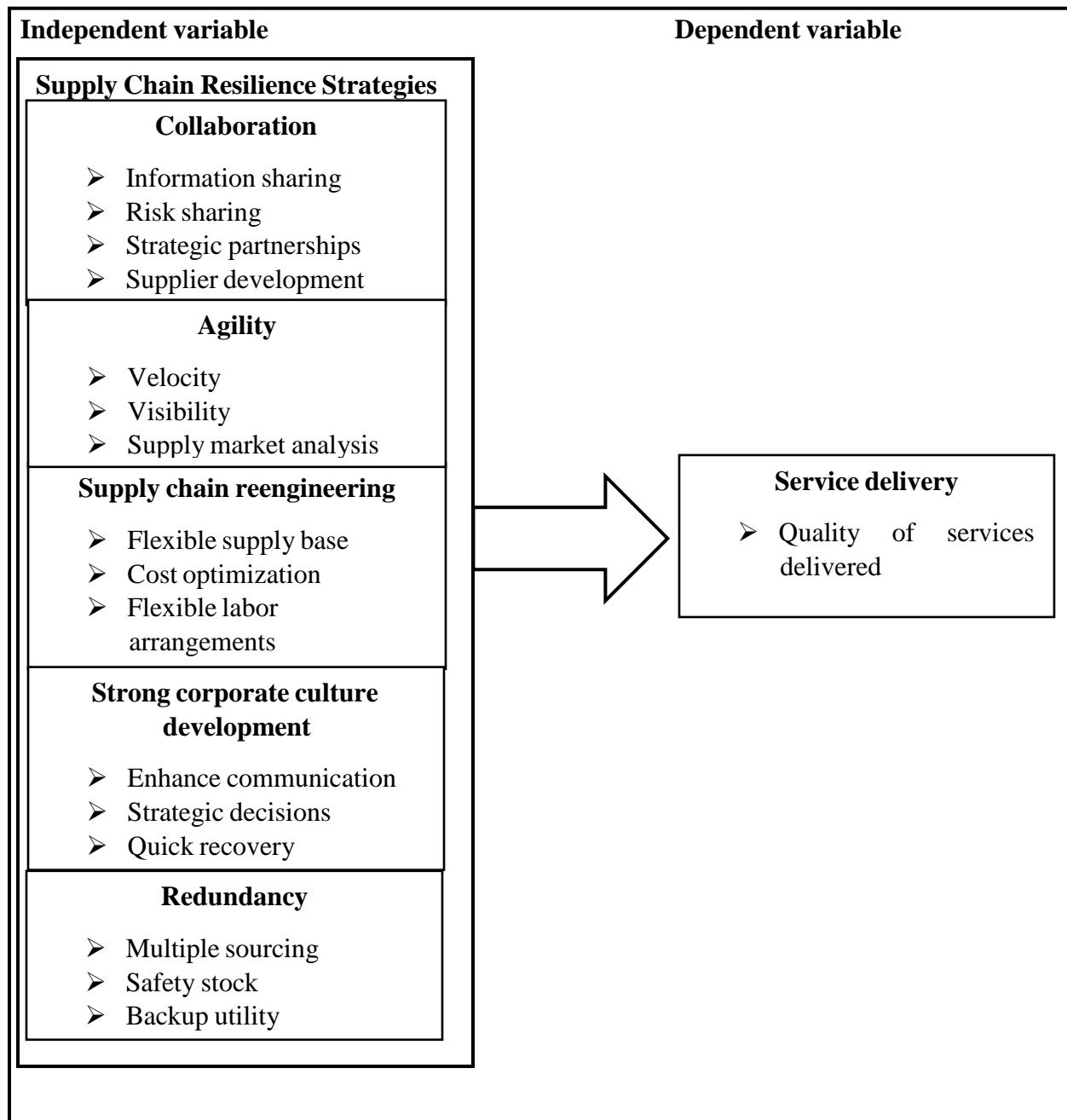
#### **2.8.5 Effects of redundancy on service delivery**

Ensuring redundancies as well as enhanced flexibility through the supply chain allows businesses to reduce the impact and likelihood of potential disruptions and in turn enhance the resilience of a supply chain to improve on service delivery. This is so because, redundancy allows the creation of buffers and keeping of safety stocks, extra inventory, multiple sourcing, backup sites, and slack capacity (Park, 2011). Therefore, when the disruption hits the organization it will be better able to manage the disturbances and ensure continuation in the supply of all materials needed hence service delivery will increase. Redundancy reduces the overall supply chain risks and makes the supply chain resilient hence increase in service delivery through a continuous flow of materials (Tang, 2008). So, redundancy is positively related to service delivery.

### **2.9 Conceptual framework**

A conceptual framework depicts how the dependent and the independent variable (Kombo and Tromp, 2009) relate. In this study, the independent variables are the supply chain resilience strategies and the dependent variable of the study is service delivery.

**Figure 2.1: Conceptual model**



Source: *Christopher and Peck (2004)*

Figure 2.1 shows how supply chain resilience strategies influence service delivery. Reengineering, collaboration, and agility are the basis of supply chain resilience, which are developed through the linkages by various supply chain players that results in responsiveness to customer need through quality service delivery.

## **2.10 Empirical evidence**

The empirical evidence refers to past research similar to this study. Empirical evidence shows how these researches relate or differ from this current study. It was very important in establishing the research gap. The literature below begins with the most recent publication.

### **2.10.1 Parast, Mahour Mellat and Subramanian, Nachiappan (2021)**

Parast, Mahour Mellat, and Subramanian, Nachiappan (2021) examined the effect of supply chain disruption risk drivers on organizational performance: evidence from Chinese supply chains. Four disruption risk drivers for a supply chain were identified namely demand disruption risk, supply disruption risk, process disruption risk, and environmental disruption risk. A cross-sectional survey was developed, and data was collected from 315 Chinese firms to determine the relationship of supply chain disruption risks to supply chain performance and firm performance. The empirical findings showed that supply disruption risks and process disruption risks have a significant impact on supply chain performance.

### **2.10.2 Nayler, J., and Subramanian, L. (2021)**

Nayler, J., and Subramanian, L. (2021) evaluated the Impact of Covid-19 on Health Supply Chains in Africa. The study was undertaken to understand the areas of the health supply chain that have been most impacted by the pandemic. Results also showed the level of preparedness of supply chain organizations before and after Covid-19. Procurement and supply chain planning, and distribution, were the top two areas cited as being affected. The escalating severity of the Covid-19 outbreak among countries has intensified supply chain disruption and uncertainty. The survey showed varying levels of readiness before the outbreak of the pandemic.

### **2.10.3 Krishnan and Pertheban (2017)**

Krishnan and Pertheban (2017) investigated the influences of supply chain resilience strategies on supply chain ambidexterity as a dynamic capability. In detail, the study sought to investigate how firms' SC ambidexterity was developed through a dynamic capability-building process and how ambidexterity can mitigate the negative impact of SC disruptions and improve business performance. The study collected data from a sample of 164 medium manufacturing SMEs operating in Malaysia. The study found that a dynamic SC resilience capability-building

the process is an antecedent of SC performance. The study identified inventory management, visibility, predefined decision plan, and diversification as dynamic SC resilience capabilities.

#### **2.10.4 Rodrigues, Vivan and Storopoli (2016)**

Similarly, Rodrigues, Vivan, and Storopoli (2016) researched the ways to model higher education institutions to enhance their attractiveness and withstand the global environment. The study used a theoretical framework approach. The study aimed at analyzing ways of creating resilience as a way of generating institutional attractiveness. The study found that institutional attractiveness can be built through resilience by internally aligning resources, capacities and processes.

#### **2.10.5 Todo, Nakajima and Matous (2015)**

Todo, Nakajima, and Matous (2015) examined how supply chain networks affected the resilience of firms to the Great East Japan Earthquake, particularly looking at the effects on the period before resuming operations after the earthquake and sales growth from the pre- to the post-earthquake period. The results indicated that the expansion of supply chain networks had two opposing effects on the resilience of firms to disasters. On one hand, when firms were connected with more firms through supply chain networks, they were more likely to experience disruptions in supply and demand, which delayed recovery. On the other hand, firms benefited from diversified networks with suppliers and clients because they would substitute the surviving firms in the network for the damaged partners and receive support from them. The study indicated that the latter positive effect on recovery exceeded the former's negative effect for many types of networks, implying that diversified supply chain networks led to the resilience of firms to natural disasters.

#### **2.10.6 Wafula and George (2015)**

Wafula and George (2015) evaluated how strategic supplier collaborations affected organizational performance. The study used the case of the Kenya Pipe Line. The study used a sample size of fifty procurement employees. Data was collected using questionnaires. Descriptive statistics were used to obtain the findings. From the findings, networking and communication channels have improved between a firm and its suppliers due to strategic supplier partnerships. It has also improved the delivery time of the products to consumers.

### **2.10.7 Aigbogun, Ghazali and Razali (2014)**

Aigbogun, Ghazali, and Razali (2014) sought to develop a framework to enhance supply chain resilience. The study aimed at investigating the vulnerabilities and the capabilities of the Malaysian pharmaceutical manufacturing supply chain by interviewing key supply chain personnel of seven Pharmaceutical companies with large manufacturing capacities in Malaysia. The study developed a framework with 4 dimensions of supply chain vulnerabilities (Turbulence, external pressures, sensitivity, and connectivity) and 6 dimensions of supply chain capabilities (flexibility, visibility, adaptability, collaboration, reserve capacity, and supplier dispersity).

### **2.10.8 Wieland and Wallenburg (2012)**

Also, Wieland and Wallenburg (2012) analyzed data collected from 270 manufacturing managers to identify the effect of robustness and agility strategies on business performance. They found that robustness has a direct, strong positive effect on business performance, whereas only an indirect effect of agility could be shown. The study recommended that organizations need to consider robustness and agility due to their primary importance to withstand everyday risks and exceptions.

## **2.11 Research gap**

There is little research on the impact of supply chain resilience strategies on the service delivery of healthcare institutions. Most of the studies done focused on how supply chain resilience strategies affect supply chains of organizations and organizational performance mainly in manufacturing industries (Krishnan and Pertheban, 2017, Aigbogun, Ghazali and Razali 2014, Wieland and Wallenburg 2012). No research was found on the impacts of supply chain resilience strategies on service delivery of private hospitals in Harare province. Therefore, it is of the researcher's interest to identify supply chain resilience strategies by private hospitals in Harare province and evaluate the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province.

## **2.12 Summary**

This chapter provides a comprehensive analysis of the concepts that are related to the study of supply chain resilience. The chapter discusses theoretical literature on supply chain resilience strategies and their effects on service delivery. It also provides a review of empirical evidence

from past studies on supply chain resilience and the literature gap established. The following chapter will address the research design and methodology.



## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The purpose of this chapter is to provide an overview of the methodology and techniques that were used to achieve the purpose of the study. The chapter discusses the research philosophy underpinning the study to investigate the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province. It mainly focused on the research design, sample size, research instruments, and data collection procedures.

#### **3.2 Research Paradigm**

The researcher used a pragmatist paradigm to overcome the weaknesses of the qualitative and quantitative approaches. The mixed research method (pragmatism) was used because it enabled the researcher to have expressive and truthful perceptions about the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province. Quantitative (positivist) research enables the researcher to gather answers to questions about relationships or links among measured variables. The positivism approach is suitable, for a large number of respondents and has the advantage of generalization of research findings. However, it is limited to quantitative issues only and qualitative data cannot be captured. The interpretive (qualitative) research will be used to answer questions about the complex nature of phenomena. The qualitative method brings out detailed findings which cannot be generalized.

### 3.3 Research Design

The study used a descriptive survey research design which gives focus to both quantitative and qualitative approaches to provide a framework to examine the characteristics of the independent variables. This was also recommended by Gilbert (2005) as it has less bias compared to other designs like an in-depth case study. Descriptive research designs produce accurate descriptions of variables relevant to the decision being faced. The study used questionnaires and interviews to gather information. This design is cheaper and can greatly reduce financial constraints without negatively affecting the effectiveness of the research.

#### 3.3.1 Justification

It is considered appropriate as it deals with many members of the population spread all over the country where it is not possible to study all of them. Mugenda and Mugenda (2003) agree that descriptive design is most preferred because it reports on things as they are.

#### 3.4 Target population

The target population in this study was 23 private hospitals in Harare province. According to Cooper and Schindler (2006), a target population should be clear and precise. This particular population was believed to provide the necessary information about the supply chain resilience strategies used and their impact on service delivery.

#### 3.5 Sample size

The sample size in this study is 22 private hospitals in Harare province, determined using the Krejcie-Morgan (1970) sample size calculation with the formula below.

$$S = \frac{X^2 NP(1 - P)}{d^2(N - 1) + X^2 P(1 - P)}$$

Where: **S** is the required sample size, **X** is the Z value (1.96 for 95% confidence level), **N** is the population size, **P** is the population proportion expressed as a decimal (assumed to be 0.5 that is 50%), and **d** which is the degree of accuracy (5%), expressed as a proportion (0.05); it is margin of error.

### **3.6 Sampling techniques**

The researcher used probability sampling. A sample size of 22 private hospitals in Harare province was drawn using the Krejcie-Morgan (1970) sample size calculator.

#### **3.6.1 Simple random sampling**

The researcher used a probability sampling method for questionnaire, which is simple random sampling. In probability sampling every unit in the population has a chance ( $0 < X < 1$ ) of being selected in the sample which can be accurately determined. Sampling reduces research costs and increased the speed at which data is collected (Cooper and Schindler, 2003). Simple random sampling allows the sampling error to be calculated and reduces selection bias. A specific advantage is that it is the most straightforward method of probability sampling. A disadvantage of simple random sampling is that you may not select enough individuals with your characteristic of interest, especially if that characteristic is uncommon. It may also be difficult to define a complete sampling frame and inconvenient to contact them, especially if different forms of contact are required (email, phone, post) and your sample units are scattered over a wide geographical area.

### **3.7 Research Instruments**

Questionnaires and interviews were used as instruments to collect primary data. The researcher sought to use different research instruments to improve the reliability of the research findings.

#### **3.7.1 Questionnaires**

The questionnaire method was used since it enabled the researcher to gather data both quantitatively and qualitatively from the respondents. In this research close-ended questions were used to maintain simplicity and collect as much information as possible (Hofstee, 2006).

The researcher enjoyed numerous advantages from using questionnaires which include a quick collection of information, precise responses, and unnecessary data left out. The other benefits were that the format is familiar to most respondents so it became simple and quick for the respondent to complete thereby giving the researcher enough time to analyze the data collected.

Despite the above benefits questionnaires also had a major drawback that participants tend to forget important issues. So as a research instrument the questionnaire was carefully scrutinized by

considering the level of education of the respondent first before basing on it to ensure that it would provide valid, precise, and reliable data. The questionnaires were used since they were easy to administer and data obtained is easily analyzed (Mugenda and Mugenda, 2003).

### **3.7.2 Interviews**

This study made use of structured interviews whereby an interview guide was used to ask questions to key informants like management and those directly in the purchasing department. Because of financial constraints and covid-19 pandemic, the researcher used telephone interviews which are however a better way of interviewing to obtain the best results since there would be no judgment of physical appearance.

Flanagan (2015) posits that numerous benefits are derived from using telephone interviews. Hence the researcher enjoyed several benefits from this instrument which includes; more detailed questions were asked, a high response rate was achieved, ambiguities were clarified and incomplete answers were followed up.

## **3.8 Data Sources**

The researcher used primary data for this study.

### **3.8.1 Primary Data**

The research adopted primary data which was collected through questionnaires and interviews. Primary data was obtained from respondents from private hospitals in Harare province. Primary data was useful to this research as it collected specific data that addressed the objectives of this study. The researcher used primary data to extract exactly what is needed to answer research questions. Primary data is current and relevant to the problem under investigation (Zikmund, 2003). That is data collected reflects current supply chain resilience strategies and their effects on service delivery of private hospitals in Harare province.

## **3.9 Validity and Reliability**

This section discussed the validity and reliability of the study as shown below.

### **3.9.1 Validity**

To ensure validity, a pilot test was conducted before issuing the questionnaire to survey respondents. “pre-testers” were used for the questionnaire and for the interview guide. Pre testing is a means to test the sample procedure (Zikmund, 2003). The research instruments used were accurate since the jargon was adjusted and both the questions of the interview and the questionnaire helped to collect the required data. The questionnaires and sample designs were also initially pre-tested to get an estimation of the time and resources needed to carry out the research and to uncover problems of sampling. This exercise also enabled the researcher to ensure that questionnaires produced the required data and that the technical jargon was well understood by the targeted respondents as postulated by Creswell (2012) that the validity of questionnaires is ought to be logical and factually sound.

### **3.9.2 Reliability**

The Cronbach Alpha test was done test the reliability of the questionnaire results. Cronbach Alpha coefficients produced is 0.819 Cronbach Alpha coefficients measure the consistency reliabilities of the research instrument (Kline, 2005). That is, whether or not the instrument will produce consistent findings at different times and under different conditions. Normally, reliability coefficient of 0,80 or higher is regarded as good, the higher the co-efficient; the more reliable the research instrument is (Kline, 2005). Therefore, the reliability coefficient of 0.819 was higher and regarded as good and acceptable. To ensure that the data collected was reliable every representative of the chosen sample responded to the same questionnaire which consisted of the same questions and of the conducted interviews the representatives of the chosen samples answered the same set of questions. Reliability was achieved by using well-designed questionnaires to avoid ambiguous questions (Yin, 2011).

### **3.10 Pilot Study**

The researcher carried out a pilot study using Cronbach’s alpha to test the validity and reliability of the questionnaire. The results from Cronbach’s alpha helped the researcher in eliminating and modifying the questions that were not able to measure the construct of the study. According to Teijlingen and Hundley (2001), conducting a pilot study gives a warning about where the main research project could fail, where the research protocols may not be followed, or whether proposed methods or instruments are appropriate or too complicated. Based on the pilot study the

questionnaires were refined by removing any questions that provided unwanted or irrelevant information.

### **3.11 Data presentation and analysis procedure**

The collected information was presented and analyzed using quantitative and qualitative data analysis techniques which are mathematical and non-mathematical analytical procedures. Data from questionnaires was quantitatively analyzed using Statistical Package for Social Sciences (SPSS) and frequencies were presented in various graphical and tabular aggregations and coding of data. Multiple regression analyses were performed on primary data to show the relationship between two variable factors which are supply chain resilience strategies (independent variable) and service delivery (dependent variable) (Saunders et al, 2003). Thus it explains whether there is a strong relationship or weak relationship between variables. The correlation coefficient for regression ranges from -1 to +1 where negative values imply a negative relationship while positive values imply a positive relationship. That is regression analysis enabled the researcher to measure the effect of supply chain resilience strategies on service delivery of private hospitals in Harare province.

#### **Regression model:**

The researcher used the following model to analyze the relationship between supply chain resilience variables and the service delivery of private hospitals in Harare province.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \epsilon$$

#### **Where:**

**Y**= Service delivery

**$\beta_0$**  = Constant

**$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  and  $\beta_6$**  : Are all regression coefficients of the following variables and  **$\epsilon$**  is the error term.

**X1**= Level of education

**X2**= Position in the organization

**X3**= Experience in years

**X4**= Supply chain collaboration

**X5**= Supply chain agility

**X6**= Supply chain reengineering

Demographics were included in the model to aid as control variables.

### **3.12 Ethical Considerations**

The researcher ensured that the questionnaires were answered voluntarily and that respondents did not disclose the names of their organizations since the data collected was treated as grouped data. Carl (2002) stipulates that individuals willing to participate in the research process have a right to have their privacy protected. The researcher assumed that the respondents' information was going to remain private and confidential. Due diligence, fidelity to professional responsibilities, and a duty of care should always be exercised in a business environment according to Lysons and Farrington (2012). All study participants were treated with respect, fairness, and dignity.

### **3.13 Chapter Summary**

This chapter gave insight into the research methodology used in the study including their justifications. The chapter discussed the research design adopted by the study. The population and sampling techniques were also discussed. The target population is 23 private hospitals in Harare province. The study also used interviews to interview staff members on the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province. The study also discussed the research instruments used in the data collection as well as the validity and reliability of the study. Finally, the study looked at the ethical considerations of the study.

## CHAPTER IV

### DATA PRESENTATION, ANALYSIS AND DISCUSSION

#### 4.1 Introduction

The chapter focuses on data presentation, analysis and discussion. It presents the study findings and concentrates on both quantitative and qualitative data analysis acquired through questionnaires and interviews. The data was presented in the form of figures and tables which makes it easy for the reader to clearly see the relationship in the data.

#### 4.2 Analysis of response rate

**Table 4. 1 Analysis of response rate**

<b>Instrument</b>	<b>Expected</b>	<b>Actual</b>	<b>Percentage (%)</b>
<b>Questionnaire</b>	<b>22</b>	<b>22</b>	<b>100</b>
<b>Interviews</b>	<b>5</b>	<b>5</b>	<b>100</b>

**Source: Primary data (Researcher, 2021)**

Table 4.1 illustrates that the researcher distributed 22 questionnaires and received 22 responses giving a response degree of 100 percent. The response rate is adequate to proceed with the findings and draw conclusions from the study. The researcher carried out interviews with procurement managers of five hospitals and a response rate of 100 percent was also found. Cooper

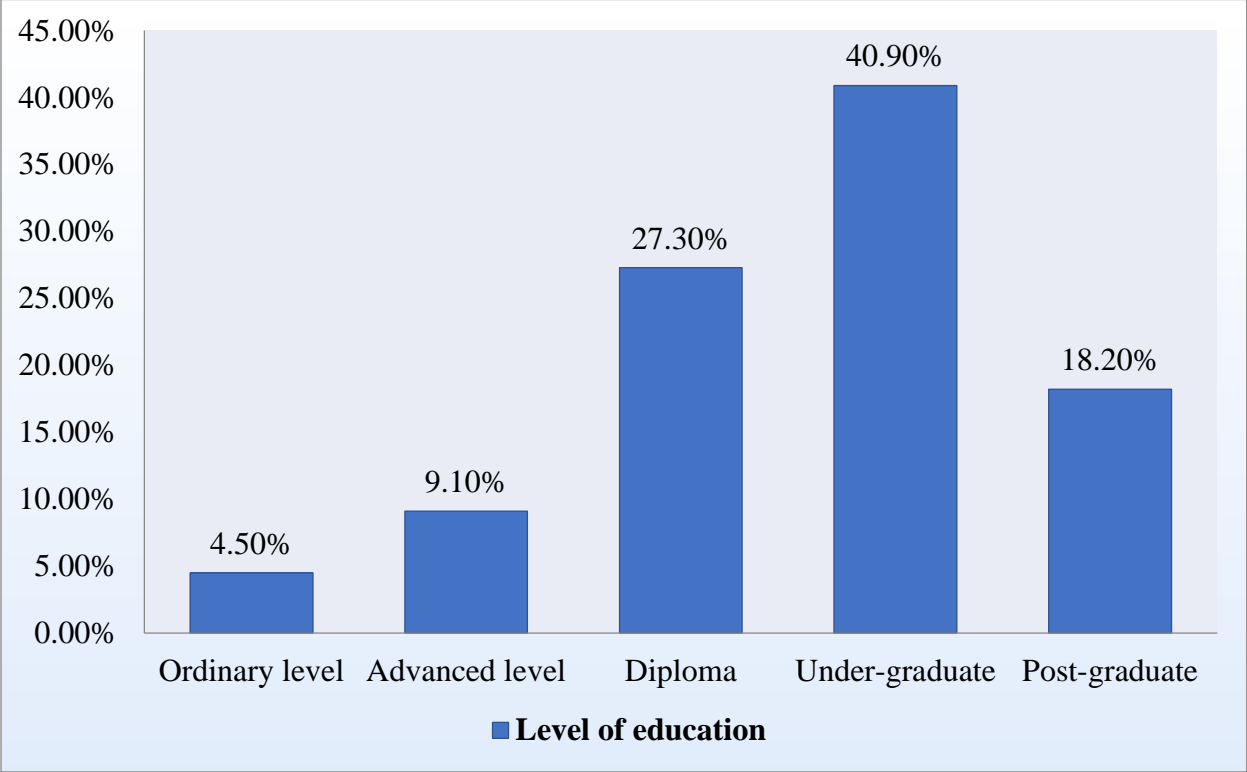


and Schinder (1992) state that a response rate of between 50% and 92% is enough to give validity and reliability of the study.

### 4.3 Demographic data

#### 4.3.1 Level of education of the respondents

Figure: 4.1 Level of education

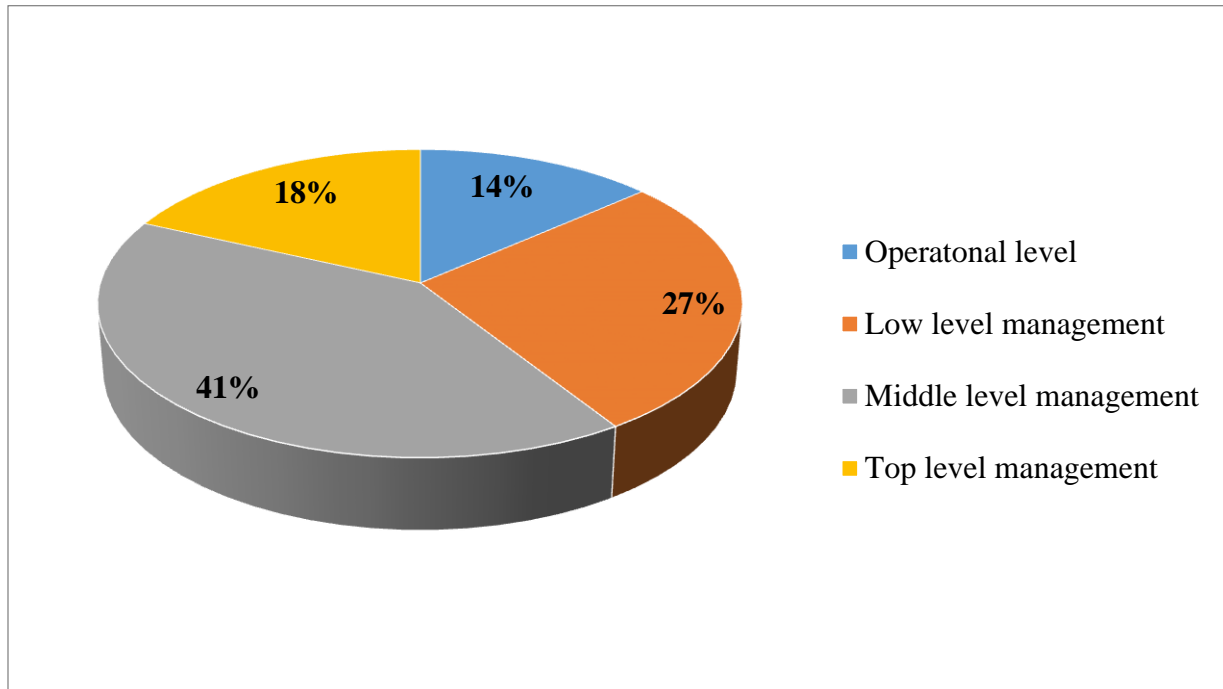


Source: Primary data (Researcher, 2021)

Figure 4.1 shows the level of education of respondents. From figure 4.1 above it is evident that 40.9 percent of the respondents holds under-graduate degree, followed by 27.3 percent who holds academic diplomas and 18.2 percent who holds post-graduate qualification. The respondents who holds an advanced level and ordinary level certificates constitutes 9.1 percent and 4.5 percent respectively. Figure 4.2 above indicates that most of the respondents are competent with the majority being holders of under-graduate degree. This suggests that majority of the hospital players have sufficient and enough knowledge.

### 4.3.2 Position held

Figure 4.2 Position in the organisation



**Source: Primary data (Researcher, 2021)**

Figure 4.2 shows the position of the respondents within their organisations. From figure 4.2 above, it is evident that 14 percent holds operational level position. Those who hold low level management position are just 27 percent. Middle level management position are 41 percent whilst top level management positions are 18 percent. This implies that majority of the respondents served as middle level managers.

### 4.3.3 Experience of the respondents

Figure 4.3 Respondents experience

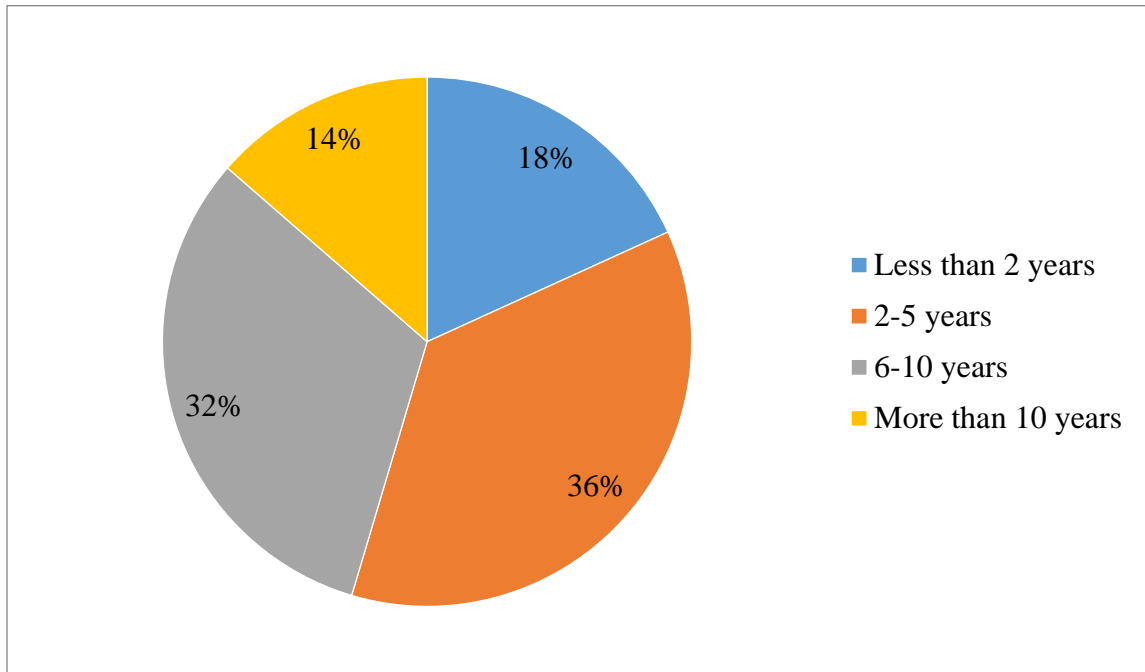


Figure 4.3 shows the experience of respondents. As shown in the figure 4.3 above the majority of respondents which is 36 percent fall in the age range of 2-5 years followed by 32 percent in the range of 6-10 years. The experience of respondents of less than 2 years and more than 10 years had 18 percent and 14 percent respectively. This implies that the hospitals are relatively dominated by low level experienced people who have potential to improve on service delivery.

#### 4.4 Supply chain resilience strategies: descriptive statistics

Table 4. 2 Supply chain resilience strategies: Descriptive statistics

SCRES strategies	N	Mean	Std. Deviation
Collaboration	22	4.4545	0.91169
Agility	22	4.2727	0.98473
SC- reengineering	22	4.1818	0.79501
Strong corporate culture	22	4.0455	0.95005
Redundancy	22	3.9091	1.26901

**Source: Primary data (Researcher, 2021)**

The above Table 4.4 shows the means and standard deviations for the response regarding to the implementation of supply chain resilience strategies by private hospitals in Harare province. From the data in Table 4.4, the mean of collaboration is (mean=4.4545) whilst (standard deviation=0.91169). Supply chain agility has a (mean=4.2727) and (standard deviation=0.98473) whilst supply chain reengineering has the (mean=4.1818) and the (standard deviation=0.79501). Strong corporate culture development has a (mean=4.0455) and (standard deviation=0.95005) whilst Redundancy has a (mean=3.9091) and (standard deviation=1.26901). The mean is the most commonly used mathematical measure of average. In terms of the total response, respondents definitely agreed that their institutions practiced supply chain resilience strategies which are collaboration, agility supply chain reengineering and strong corporate culture development. However, some respondents were not sure if redundancy is being practiced within their organizations.

The results were consistence with responses from the interview. All of the five procurement managers from the picked hospitals pointed out that a variety of supply SCRES strategies are being used by private hospitals in Harare province. All the tested above SCRES strategies were acknowledged by participants to be employed by private hospitals in Harare province.

**(Participant 1)**

*“There are a number of supply chain resilience strategies being implemented at the hospital. We team up with other hospitals and pharmaceutical suppliers and aim to create value through intangible forms, such as strategic planning, reputation, employee motivation which results in quality service delivery. Furthermore, the hospital maintains long-term direct relationships with suppliers help to manage the risks and upturn service delivery.”*

**(Participant 2)**

Another participant states the supply chain resilience strategies employed at their hospital as follows: *“I would say, collaboration, redundancy, agility, supply chain reengineering, strong corporate culture development and flexibility. We apply a quite lot of supply chain resilience strategies here to manage our supply chains and increase service delivery.”*

**Table 4.3 Collaboration strategy**

<b>Statement</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Teaming up with other organizations increases the quality and level of service delivery.	22	4.0000	1.23443
Teaming up with other organizations creates value through intangible forms, such as strategic planning, employee motivation and results in quality service delivery.	22	4.0000	1.11270
Long-term direct relationships with suppliers help to manage the risks and upturn service delivery.	22	3.9091	1.47710
Early supplier engagement and teaming up with other institutions insure against risks in the supply chain and increase service delivery.	22	4.0455	1.25270
Strategic supplier partnerships increase networking channels with suppliers increase efficiency leads to improved service delivery.	22	4.1818	1.05272

Table 4.3 above shows that the mean of collaboration strategy. The means of the above questions are ranked 4 (4 = agree, according to the Likert scale) which means the respondents agreed that

collaboration increases quality and level of service delivery (mean=4.0000 and std. deviation=1.23443), creates value through intangible forms such as strategic planning (mean=4.0000 and std. deviation=1.11270), insures against risks in the supply chain (mean=4.0455 and std. deviation=1.25270) and increases efficiency which leads to improved service delivery (mean=4.1818 and standard deviation=1.05272). However, some respondents were not sure if collaboration help manage risk (mean=3.9091 and std. deviation=1.47710) and The results were also in consistence with the responses from interviews where the participants acknowledged that collaboration strategy improves service delivery.

A study by Wafula and George (2015), the researchers evaluated on how strategic supplier partnerships affected organizational performance. From the findings, networking and communication channels have improved service delivery and improves client service help and satisfaction. These findings agree with the research findings in Table 4.3 which highlights the positive effects of collaboration on service delivery.

**Table 4.4 Supply chain agility strategy**

<b>Statement</b>	<b>N</b>	<b>Mean</b>	<b>Std.Deviation</b>
Quickness and alertness maintains operational levels that minimize costs and result in quality service delivery.	22	4.0000	1.27242
The adoption of agility technique lead to improved client service delivery levels.	22	3.8636	1.45718
Agility ensures continuous flow of medical equipment and medicines which lead to improved service delivery levels.	22	4.0455	1.25270
Agility in my organization includes recording and monitoring risk levels and respond on it to improve service delivery.	22	4.1364	1.08213
The procurement team effectively anticipate the future risks and respond quickly and lead to improved service delivery.	22	4.0455	1.21410

Table 4.4 above shows that the mean of supply chain agility strategies. The adoption of agility practices has enabled continuous flow and agility in many organizations maintains operational levels that minimizes costs and reduce risk levels with the mean of 4.0000, 4.0455 and 4.1364 correspondingly. The statements were supported by lower values of standard deviations which are 1.27242, 1.25270 and 1.08213 respectively. The respondents agreed that agility effectively help anticipate future risks and ensures quick response with the mean of 4.0455 and standard deviation of 1.21410. However, respondents were also neutral on whether the adoption of agility strategy improve client service delivery with a mean of 3.8636 and standard deviation of 1.45718.

The findings on agility strategy shown in Table 4.4 indicate that most hospitals are able to respond quickly to the changes and disruptions in the operations of the institution.

**Table 4.5 Supply chain reengineering strategy**

Statement	N	Mean	Std. Deviation
Through reengineering strategy, the organization mitigate risks and results in improved quality of service offered.	22	4.0455	1.36198
Supply chain reengineering reduces considerable costs which increase the quality of service delivered.	22	3.9545	1.21410
Through supply chain engineering aid specialization on creating sustainability and improving service delivery.	22	3.3136	1.55978
Supply chain reengineering helps to gain a competitive edge and have clear decisions procedures that improve service delivery.	22	4.0000	1.27242

The findings in Table 4.5 indicate that risks are mitigated to improve service delivery and helps to gain a competitive edge through clear decisions procedures that improve service delivery with the mean of 4.0455 and 4.0000 respectively. This is show with low standard deviations which are 1.36198 and 1.27242 correspondingly. Respondents were however not sure and neutral whether supply chain reengineering reduces considerable costs and aid specialization on creating

sustainability to improve service delivery which is shown in Table 4.5 with the mean of 3.9545 and 3.3636 respectively. The standard deviations were 1.21410 and 1.55978 correspondingly.

A study by Santos et al., viewed supply chain reengineering as an integrated prospective in the process of supply chain design with the traditional constraints, cost optimization and customer service to enhance flexibility through customization in different situations. The findings by (Santos et al.,) mirrors the research findings in the study under Table 4.5 that highlight the positive impact on supply chain reengineering on service delivery of private hospitals in Harare province.

#### 4.5 Service delivery

The dependent variable of the study was service delivery. The findings are indicated in Table 4.6.

**Table 4.6 Service delivery**

Statement	N	Mean	Std. Deviation
Reduction in costs results in improved service delivery	22	4.0000	1.27242
Increased customer satisfaction	22	4.0455	1.25270
Improved quality of services offered	22	4.0455	1.25270
Effectiveness and efficiency in operations	22	4.1364	1.08213
Reduced clients complains	22	4.0455	1.21409

Table 4.6 shows that due to supply chain resilience, most of the studied organizations have managed to reduce costs resulting in improved service delivery, increased customer satisfaction, improved quality of services offered, improved in effectiveness and efficiency in operations and reduced clients complains with means of 4.000, 4.0455, 4.0455, 4.1364 and 4.0455 respectively.

#### 4.5 Supply chain resilience and service delivery



To determine the effect of supply chain resilience on service delivery, the researcher employed regression analysis. Table 4.7 shows the findings of the model summary.

**Table 4.7: Model Summary**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	0.789 <sup>a</sup>	0.622	0.471	0.28709

As shown in Table 4.7, the coefficient of determination R squared is 0.622. This infers that 62.2% change in service delivery of the studied hospitals is explained by the supply chain resilience in place.

In order to determine the overall significance of the regression model, it was important to carry out an Analysis of Variance at 5% level of significance as indicated in Table 4.8.

**Table 4.8: ANOVA**

	<i>Df</i>	<i>Sum of squares</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Regression	6	2.036	0.339	4.118	0.012 <sup>b</sup>
Residual	15	1.236	0.082		
<b>Total</b>	<b>21</b>	<b>3.273</b>			

From Table 4.8, the value of F calculated is 4.118 while F critical (obtained from F Distribution Tables at degrees of freedom 6 and 15) is 2.791. Therefore, the value of F calculated is greater than F critical. The overall regression model was therefore fit.

The significance of the individual variables of the study were determined by their p values. The interpretation of significance was conducted at 5% level of significance as shown in Table 4.9.

**Table 4.9: Regression Coefficients**

	Unstandardized coefficients		Standardized coefficients		
	B	Standard Error	Beta	T	Sig.
(Constant)	.110	.701		.156	.154
Education level	.599	.350	.108	1.710	.621
Position	-.404	.390	.317	-1.035	-.379
Experience	.107	.070	.148	1.526	.112
Collaboration	.036	.057	.544	.621	.039
Agility	.058	.060	.352	.961	.062
SC reengineering	-.004	.090	.962	-.049	.001

The resultant equation becomes;

$$Y = 0.110 + 0.599X1 - 0.404X2 + 0.107X3 + 0.036X4 + 0.058X5 - 0.04X6$$

**X1**= Level of education

**X2**= Position in the organization

**X3**= Experience in years

**X4**= Supply chain collaboration

**X5**= Supply chain agility

**X6**= Supply chain reengineering

Thus at 5% level of significance, level of education ( $\beta=0.599$ ,  $p=0.621>0.05$ ) positively and significantly affected on service delivery. Position in the organization ( $\beta=-0.404$ ,  $p=-0.379<0.05$ ) negatively and insignificantly affected on service delivery. Experience ( $\beta=0.107$ ,  $p=-0.112<0.05$ ) positively and significantly affected on service delivery.

Collaboration ( $\beta=0.036$ ,  $p=0.039<0.05$ ) positively and significantly affected on service delivery. Supply chain agility ( $\beta=0.058$ ,  $p=0.062>0.05$ ) positively and significantly affected on service delivery. Supply chain reengineering ( $\beta=-0.004$ ,  $p=0.001<0.05$ ) negatively and significantly affected on service delivery. Thus it can be deduced the supply chain resilience strategies has a positive and significant impact on service delivery. Munywoki (2016) studied on the supplier chain risk management practices on competitiveness in automotive industry in Nairobi City County and established a positive correlation of supply chain risk management practices and competitiveness of the firms.

#### **4.6 Summary**

This chapter focused mainly on the presentation, analyzing and discussion of the study findings. The study findings were presented by way of graphs and tables for easy of interpretation. The next chapter gives the summary, conclusions and recommendations of the study.

## **CHAPTER V**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter present a summary of the major findings of the research. The main objective of this study was to establish the effects of supply chain resilience strategies on service delivery of private hospitals in Harare province. The researcher brought forward recommendations for effective supply chain resilience strategies on service delivery of private hospitals in Harare province. The chapter provided the major research conclusions drawn.

#### **5.2 Summary of research findings**

In relation to supply chain resilience strategies employed by private hospitals in Harare province, the researcher found out that most private hospitals acknowledged that there is collaboration with other institutions within the organization. The researcher also found out that the private hospitals acknowledged supply chain agility and supply chain reengineering. Procurement professionals from hospitals interviewed, also confirm that hospitals are engaging in supply chain resilience strategies to improve service delivery of private hospitals in Harare.

In relation to the effects of supply chain resilience strategies on service delivery of private hospitals in Harare province, the researcher found out that supply chain resilience strategies done by hospitals results; reduced costs, increased customer satisfaction, improved quality of services offered, improved in effectiveness and efficiency in operations and reduced clients complains.

The researcher also found out that all procurement professionals from the private hospitals interviewed confirmed that supply chain resilience strategies has led to an improvement on service delivery. The improvement on service delivery have resulted in customer satisfaction.

Regression analysis results show that there is positive and significant relationship between supply chain collaboration and service delivery. The regression analysis also shows that there is a positive relationship between agility and service delivery. The results also show a positive relationship between supply chain reengineering and service delivery.

### **5.3 Conclusions**

The conclusion of the research study on the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province can be highlighted as follows:

- The following supply chain resilience strategies are being employed by private hospitals in Harare province; collaboration, supply chain agility and supply chain reengineering.
- Most of these supply chain resilience strategies have helped private hospitals in Harare province to reduce costs, improved improve service delivery times and improved quality of services delivered or offered.
- In general, the study indicates that there is a positive relationship between most of the supply chain resilience strategies and service delivery involved in this research.

### **5.4 Recommendations**

In the light of the above conclusions, it is recommended that;

- Hospitals should strengthen supply chain resilience so as to improve on service delivery and ensure reliable supply of medicines and equipments to their hospital for the benefit of patients.
- Hospitals should collaborate with other institutions and suppliers to insure smoothflow of medicines and medical equipment. This will improve service delivery. Further the study recommends that the hospitals should invest in a reliable and convenient communication media with other institutions. This will enhance information sharing.

- Hospitals should strengthen their agility and enhance its quickness and response to disruptive events so as to recover promptly from disturbances.
- Hospitals should aim to strengthen and improving supply chain reengineering to ensure flexibility. This will result in a flexible supply base and in times of disruptions it can quickly respond and adjust to the environment and will in turn help improve constant availability of medicines and drugs to hospitals.

### **5.5 Recommendations for further studies**

This study investigates the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province. This study recommends that in future the study can be extended to other regions of the country for comparison purposes and should also be extended to other supply chain resilience strategies that affect service delivery of hospitals.

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## **APPENDIX 1: LETTER SEEKING PERMISSION TO CARRY OUT RESEARCH**

### **BINDURA UNIVERSITY OF SCIENCE EDUCATION**



P. Bag 1020

Bindura

30 October 2021

Dear sir/Madam

**REF: AUTHORITY TO CARRY OUT A STUDY IN THE SUPPLY CHAIN DEPARTMENT.**

I am a student at Bindura University of Science Education pursuing a degree in Purchasing and Supply. The title of the research is: The impact of supply chain resilience strategies on service delivery of private hospitals in Harare province. The objectives of the study are:

1. To determine the effect of collaboration on service delivery of private hospitals in Harare province.
2. To establish the influence of supply chain reengineering on service delivery of private hospitals in Harare province.
3. To assess the effect of agility on service delivery of private hospitals in Harare province.

I do hereby ask for permission to carry out a study in your organisation. You can also refer to the copy of research instrument which I intend to use in my research. Should you require any further information, please do not hesitate to contact me as indicated below.

**Yours faithfully**

**Ian Manyani +263784567070 [imanvanih99@gmail.com](mailto:imanvanih99@gmail.com)**

## APPENDIX 2: LETTER TO RESPONDENTS

**BINDURA UNIVERSITY OF SCIENCE EDUCATION  
FACULTY OF COMMERCE  
DEPARTMENT OF ECONOMICS**



### **REF: REQUEST FOR COMPLETION OF QUESTIONNAIRE.**

My name is Ian Manyani, a fourth-year student at Bindura University of Science Education pursuing a Bachelor of Commerce Honors Degree in Purchasing and Supply. I am presently involved in carrying out research concerned with the impact of supply chain resilience strategies on service delivery of private hospitals in Harare province. The information you provide will be treated with confidentiality and used only for this study. I would be grateful if you would spare time and complete the questionnaire below.

Your cooperation is greatly appreciated

Yours faithfully

Ian Manyani +263784567070 [imanyanih99@gmail.com](mailto:imanyanih99@gmail.com)



## **SECTION A: GENERAL INFORMATION**

### **SECTION A: Introductory Questions**

Kindly answer the following questions by indicating the relevant box or writing down answers in the spaces provided.

#### **1. Indicate your highest academic qualification**

- |                      |     |
|----------------------|-----|
| GCE 'O' Level        | [ ] |
| GCE 'A' Level        | [ ] |
| Diploma              | [ ] |
| Undergraduate Degree | [ ] |
| Post Graduate Degree | [ ] |

#### **2. Your position within the organization?**

- |                         |     |
|-------------------------|-----|
| Operational level       | [ ] |
| Low level management    | [ ] |
| Middle level management | [ ] |
| Top level management    | [ ] |

#### **3. Experience in years**

- |                    |     |
|--------------------|-----|
| Less than 2 years  | [ ] |
| 2- 5 years         | [ ] |
| 6- 10 years        | [ ] |
| More than 10 years | [ ] |

**SECTION B: SUPPLY CHAIN RESILIENCE STRATEGIES**

Kindly indicate the extent to which you agree or disagree about the supply chain resilience strategies being employed at your organization. **Please indicate your response using 5 points Likert scale. 1=strongly disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=strongly agree (SA).**

**Kindly tick the response that best describes your answer.**

	Statement	SD	D	N	A	SA
		1	2	3	4	5
1	The hospital team up (collaboration) with other institutions.					
2	The hospital is capable of responding to disturbances and disruptions quickly (agility)					
3	The hospital have backup or alternative suppliers and buffer stock for materials (redundancy)					
4	The hospital have enhanced communication that fosters quick decisions for recovery (strong corporate culture)					
5	The hospital have a flexible supply chain base to source materials and medications (supply chain reengineering)					

Kindly indicate the extent to which you agree or disagree about the influence of supply chain collaboration strategy in your organization could have on service delivery. **Please indicate your response using 5 points Likert scale. 1=strongly disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=strongly agree (SA).**

**Kindly tick the response that best describes your answer.**

	Statements	SD	D	N	A	SA
		1	2	3	4	5
1	Teaming up with other organizations increases the quality and level of service delivery.					

2	Teaming up with other organizations creates value through intangible forms, such as strategic planning, employee motivation and results in quality service delivery.					
3	Long-term direct relationships with suppliers help to manage the risks and upturn service delivery.					
4	Early supplier engagement and teaming up with other institutions insure against risks in the supply chain and increase service delivery.					
5	Strategic supplier partnerships increase networking channels with suppliers increase efficiency leads to improved service delivery.					

Kindly indicate the extent to which you agree or disagree about the influence of supply chain agility strategy in your organization could have on service delivery. **Please indicate your response using 5 points Likert scale. 1=strongly disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=strongly agree (SA).**

**Kindly tick the response that best describes your answer.**

	Statement	SD	D	N	A	SA
		1	2	3	4	5
1	Quickness and alertness maintains operational levels that minimize costs and result in quality service delivery.					
2	The adoption of agility technique lead to improved client service delivery levels.					
3	Agility ensures continuous flow of medical equipment and medicines which lead to improved service delivery levels.					
4	Agility in my organization includes recording and monitoring					

	risk levels and respond on it to improve service delivery.					
5	The procurement team effectively anticipate the future risks and respond quickly and lead to improved service delivery.					

Kindly indicate the extent to which you agree or disagree about the influence of supply chain reengineering strategy in your organization could have on service delivery. **Please indicate your response using 5 points Likert scale. 1=strongly disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=strongly agree (SA).**

**Kindly tick the response that best describes your answer.**

	Statement	SD	D	N	A	SA
		1	2	3	4	5
1	Through reengineering strategy, the organization mitigate risks and results in improved quality of service offered.					
2	Supply chain reengineering reduces considerable costs which increase the quality of service delivered.					
3	Through supply chain engineering aid specialization on creating sustainability and improving service delivery.					
4	Supply chain reengineering helps to gain a competitive edge and clear decisions procedures that improve service delivery.					

## **SECTION C: SERVICE DELIVERY**

There is an increase in service delivery at our organization

Yes [ ] No [ ]

Below are several effects of supply chain resilience on service delivery. Kindly indicate the extent to which you agree or disagree on how supply chain resilience has affected service delivery within your organization. **Please indicate your response using 5 points Likert scale. 1=strongly disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=strongly agree (SA).**

**Kindly tick the response that best describes your answer.**

	Statement	SD	D	N	A	SA
		1	2	3	4	5
1	Reduction in costs results in improved service delivery					
2	Increased customer satisfaction					
3	Improved quality of services offered					
4	Effectiveness and efficiency in operations					
5	Reduced clients complains					

### APPENDIX 3: INTERVIEW GUIDE

1. What are the supply chain resilience strategies used by your organization in managing its supply chain to improve service delivery?
2. Do you agree that SCRES strategies can assist in the improvement of service delivery?
3. What are the challenges being encountered in implementing supply chain resilience strategies to improve service delivery?
4. What recommendations resulting from this research study would you suggest for resolving challenges faced by your organization?