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An Examination of the factors influencing the mode of child delivery in Nairobi County.

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AN EXAMINATION OF THE FACTORS INFLUENCING THE MODE OF CHILD DELIVERY IN NAIROBI COUNTY

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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ABSTRACT

Kenya has a female population of approximately 25.8 million people according to the World Bank 2018 data (50.32% of the total population). Of these, 25.4% are of childbearing age between ages 15 to 49 (6.5 million). During childbirth, the women deliver at various healthcare facilities including at home and undergo two main types of delivery: vaginal birth (normal delivery) or caesarean section (C-section) delivery. The recommended form of child delivery is normal delivery. World Health Organization (WHO) recommends that C-section surgeries be carried out only when medically necessary. The international healthcare community recommends a C-section rate of 10 - 15%. There continues to be growing global concern however about the increased rate of C-section deliveries. This research sought to study the growing trend of C-section rates using a study of Nairobi County in Kenya with a specific focus on examining the factors influencing the mode of child delivery. The study obtained data from several health facilities in Nairobi County. The data relates to the records of patients for the last thirty-six (36) months who have delivered by way of normal delivery or C-section and the classification of the patients by some of the key influencing factors for example the pre-payment mechanisms which include National Hospital Insurance Fund (NHIF), private health insurance and others. This was supported by questionnaires aimed at obtaining information on another key factor influencing mode of child delivery being the characteristics of the women who opt for different modes of delivery namely normal delivery and C-section. The study aimed to provide recommendations on how best practices identified locally and globally can be implemented by the various stakeholders to achieve long term sustainable models in healthcare while ensuring quality, accessible and cost-effective healthcare services. In addition, the study sought to reinforce that C-sections be carried out only when medically necessary in the best interest of the maternal health practice and the various stakeholders. The findings indicated that there was a significantly positive correlation between key influencing factors like prepayment mechanisms and medical personnel on the mode of child delivery. The coefficient results pointed to a significant relation of medical personnel to the mode of child delivery. The independent T-test results indicated that there was a significant mean difference between the amount paid through cash and insurance. The study concluded that prepayment mechanisms and the medical personnel have a statistically significant relationship with the mode of child delivery. However, when combined with other variables, prepayment mechanisms did not have a significant predictive ability to influence the mode of child delivery. In addition, the study concluded that in terms of financial implications, women who opted for prepayment mechanisms such as NHIF, corporate insurance or private personal insurance were likely to pay more compared to those who opted for cash payment. The study recommended that the prepayment mechanisms, as a key influencing factor, enforce policies and guidelines including strategic purchasing models with healthcare service providers including medical doctors and define acceptable levels of C-section deliveries.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

AMA	Advanced Maternal Age
FY	Fiscal Year
GDP	Gross Domestic Package
HMO	Health management organization
HRMIS	Health records management information systems
NACOSTI	National Commission for Science Technology and Innovation
NCMS	New cooperative medical scheme
NHIF	National Hospital Insurance Fund
OOP	Out of pocket payment
SU-IERC	Strathmore University Institutional Ethics Review Committee
SID	Supplier Induced Demand
UHC	Universal Health Coverage
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Caesarean section delivery: Caesarean section, also known as C-section, or caesarean delivery, is use of surgery to deliver a baby. The baby is taken out through the mother's abdomen. While some C-sections are planned many are done when unexpected problems arise during a vaginal delivery putting the baby or mother at risk (MedlinePlus, 2020). The average length of a hospital stay for a C-section is 3 – 4.5 days.

Normal delivery: For this research, the term "Normal Delivery" shall be used in place of vaginal delivery.

Prepayment Mechanisms: This is a model of healthcare financing in which people pay prior for healthcare services before they are sick by contributing monies that go into a pool of funds to cater for medical expenses when they fall ill. The funds do not necessarily pay for the full costs of the care the patient receives but certain services are agreed upon to be delivered and up to certain amounts before requiring the services. Examples of these mechanisms include private health insurance and public mandatory prepayment funds like the National Hospital Insurance Fund in Kenya.

Vaginal delivery: It is the giving of birth to babies alive through the vagina, also called the birth canal. It is the natural method of birth. The average length of a hospital stay for normal vaginal delivery is 1.5 – 2 days or with an episiotomy (a surgical cut to widen the vaginal canal) 2 – 2.5 days.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

1.1.1 Influencing factors of the mode of child delivery

After conceiving a child, the journey up to the point when a child is born has many decision-making processes- most being of medical nature. However, there are several other decisions that the woman has to make ranging from which healthcare facility to have the child delivered at including options of home delivery. There are decisions on which doctor or midwife to use to bear the child. The decision of the medical personnel can be based on where the child will be delivered whether at home or a hospital. A midwife can be pre-engaged to deliver the baby at home. The mother can also start engaging a doctor or hospital throughout her prenatal care. Thus, having some indication of which hospital she will have the baby and which doctor will be used. A key issue in these decisions is always the costs associated with the medical services. The woman including her household has to determine who will bear these costs. The family may have a prepayment mechanism in place probably private insurance or the National Hospital Insurance Fund (NHIF) benefit. In absence of prepayment mechanisms, the household has to consider out of pocket expenditure also called cash payments and these can take all forms including contributions from friends and family, borrowing funds, etc.

These decisions are also greatly influenced by the characteristic of the woman with regards to her social determinants of health for example her occupation, income, level of education, age, access to medical care, etc. Besides that, other characteristics of the woman can include the marital status and the number of children.

Other key decisions considered in this process include the choice of the healthcare facility when a woman chooses to seek care at a healthcare facility. This facility may be government, private or faith based. In relation to this is also the decision on which medical personnel to deliver the child whether a hospital doctor, private doctor and/or midwife.

The above variables form the basis of this study as it seeks to explore the factors influencing the mode of child delivery in Nairobi County.

1.1.2 Mode of child delivery

This study focused on women of childbearing age between ages 15 to 49 years in Nairobi County who in the last three years have had children at a healthcare facility through one of the two main modes of child delivery being normal delivery or C-section delivery.
The continuous interest in the subject of women's mode of delivery in the field of medicine and other related fields draws a lot of diverse debates. The C-section rates, for example, have been of global concern because of the increase and the lack of consensus on the appropriate C-section rate and the associated short term and long-term health risks and financial implications (Betrán, Ye, Moller, Zhang, Gülmezoglu and Torloni, 2016).

Vaginal birth has been considered the normal mode of delivery that is most recommended in the medical field. C-section is another delivery option that is recommended for medical reasons. C-section delivery is considered a common but complicated procedure that poses health risks for the mother and child. There are more health risks in C-section births than in normal delivery. Thus, it is recommended only for medical reasons (National Institute of Child Health and Human Development, 2017).

Some scenarios in which the C-section births are recommended include; when labor is not progressing, the baby is in distress, a mother is carrying multiples, there is a problem with the placenta, there is a prolapsed umbilical cord, there are health concerns, there is a medical obstruction or a previous C-section has been performed (WebMD Medical Reference, 2019).

However, like any major surgery, there are high risks of complications. C-sections have been associated in the long term with an increased risk of asthma and obesity in children. For the mother, the risks can extend many years beyond the current delivery and affect her health. The woman may risk post-delivery complications that may result in requiring a blood transfusion, anaesthesia complications, organ injury and uterine lining infections. In

the long term, there may be other complications in subsequent pregnancies such as uterine rupture, ectopic pregnancy, among other potential challenges (World Health Organization, 2018).

The rates of C-sections are greatly increasing (World Health Organization 2018) and there seem to be several contributing factors beyond the reasons provided above. At the population level, C-section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates (World Health Organization, 2015). From the perspective of a healthcare system, any health services rendered without clinical indications can affect the management of healthcare services and the costs of the services sought leading to health economic challenges. This also affects the total healthcare expenditure at the national level and impacts the budget allocation as a percentage of the Gross Domestic Product (GDP) (Stadhouders, Kruse, Tanke, Koolman and Jeurissen, 2019). These increased expenses lead to the questioning of health outcomes as is the case where the increased C-section is not seen to deliver reduced maternal and newborn mortality rates (World Health Organization, 2015). It also leads to other questions on how such medical budgets can be justified against other pressing national priorities like defense, education, among others.

1.1.3 Prepayment Mechanisms

In April 2001, the Heads of State of African Union countries met and committed to allocating at least 15% of their annual budget to improvement of the respective country health sectors (World Health Organization, 2011). Ten years later, Kenya was still listed as countries that had made insufficient progress. Classified as a middle-income country, Kenya was still spending less than US$ 33/Kes. 3,300 per capita of government spending from domestic resources on health (World Health Organization, 2011). In 2019/2020 National Budget, Kenya's total budget was Kes 2.8 trillion of which Kes. 92.7 billion was allocated to health. This represents 3.3% of the annual budget against the committed 15% (The National Treasury, 2019). In 2016/2017, the proportion of the combined discretionary public budget allocated to health by national and county governments decreased to 7.6 % from the 7.7% allocated in the preceding year, below the pre-devolution

level of 7.8% (National and County Health Budget, 2016/17) and the Abuja declaration target of 15% (World Health Organization, 2011).

The Kenyan government aims to achieve the Universal Health Coverage (UHC) as part of its Big Four Agenda (World Bank Group, 2018). The role of healthcare financing systems like prepaid mechanisms has increased across the world as countries desire to achieve UHC (Ortiz-Ospina and Roser, 2017). These pooling mechanisms are an important financing path to achieving social protection and reducing the risks of households suffering financial catastrophe. Specifically, NHIF and private health insurers have gained momentum over the years in Kenya (Netherlands Enterprise Agency, 2016). Currently, there are two main prepayment mechanisms in Kenya today one being private and the other being social. The private insurers had revenue of Kes. 40.2 Billion (Insurance Regulatory Authority, 2018) as of 2018 while NHIF had revenue of Kes. 47.8 Billion (The National Hospital Insurance Fund, 2018) as of 2017/2018.

The progression of these prepayment mechanisms, specifically NHIF and private insurance schemes, comes with challenges of increased services and costs. It is widely known that the increase in the use of prepaid mechanisms is largely attributed to increased demand for healthcare services (Schieber, Baeza, Kress, Baeza and Maier, 2006). One of the key areas that stands out in Kenya is the increased rates of C-section births and costs. In 2017/18, 65,278 mothers covered by the NHIF had C-section deliveries up from 21,490 in 2016/17. This translated to increased payments of Kes.898 million more in 2017/18 to health facilities that performed the surgeries from Kes.621 million in 2016/17 making it a total of Kes.1.5 billion in the two years (NHIF News, 2019).

The private health insurers' highest inpatient expenditure in 2015 and 2016 was pregnancy and related medical expenses at Kes.935 million and Kes.1.04 billion, respectively. (Zamara Actuarial Administration & Consultancy Limited, 2017). Of this, C-section delivery costs are on average two to three times the cost of a normal delivery (Kenya Subsidiary Legislation, 2016)

1.2 Problem Statement

Kenya has a population of approximately 51.4 million people (World Bank, 2018). The female population percentage is 50.32% while that of the male population is 49.68%. The population between 15 - 64 years that would fall within the labor force consists of 39.9% making the rest of the population dependent on this 39.9%. Further, the dependency ratio (youth & elderly) sits at 72.8% (World Bank, 2018). This is in the context of an unemployment rate of 9.3%. This means that only a small population of the country can provide financial support to the others and this limits their resources towards various expenditures including health. This affects the ability of several households to contribute to prepayment mechanisms which are a key determinant in reducing out of pocket payments (OOP) which can be catastrophic and leads to impoverishment in many households (Chuma and Maina, 2012).

Kenya's healthcare financing system landscape in 2015/2016 mainly had its financing schemes for the current health expenditure from OOP at 28% followed by the central government schemes at 19.2% and state/regional /local government schemes at 18.2% (Ministry of Health, 2017). The Kenyan health system continues to rely heavily on OOP despite the poverty level of 36.8% (World Bank Group, 2018) and high dependency ratios of 72.8% (World Bank, 2018) leading to challenges in purchasing prepayment mechanisms as witnessed by the high OOP. Besides, the government does not adequately allocate its annual budgets at the ideal targets of 15% of the annual budget (World Health Organization, 2011) or 5% of the GDP (Mcintyre, Meheus and Røttingen, 2017) resulting in the health system being greatly underfunded.

In the background of the above healthcare financing systems landscape, the initiatives of growing the prepayment mechanisms and expanding UHC are targeted to provide financial protection and reduce OOP (World Health Organisation, 2012). About 1.48 million Kenyans are forced below the national poverty line due to OOP which is a major development challenge since it pushes non-poor households and traps those who are already poor in it. Further, 4.1% of households face catastrophic health expenditure (Chuma and Maina, 2012).

While the country faces challenges of an underfinanced health system, models of sustainability of the health financing schemes must be safeguarded through collaborative partnerships with the healthcare providers who are the end-users of healthcare funds and provide the service through healthcare purchasing. Key challenges arising in the system is financial motivations on higher use of the funds against the various purchase models (Johnson and Rehavi, 2016). Coupled with moral hazards triggered by the increase of third-party payment, the healthcare service providers and/or the patients have little incentive to control spending as long as the third payer or prepayment mechanism is funding the cost. In addition, fully insured patients have no motivation to guard their utilization. By decreasing OOP, the prepayment mechanisms increase the quantity demanded. (Henderson, 2015 pg. 8).

Within global healthcare systems, people tend to use healthcare services more when the income levels are higher, and the reverse is true that when income levels are low and people are poor, medical access is lower. At a national level, this might also be associated with inadequate access to care and health inequalities (Boatin et al, 2018). There are also cofounding factors emanating from the principle-agent relationship where healthcare workers induce demand for healthcare services like the C-section due to the likelihood of increased resources.

This was the premises of this study which sought to examine the factors influencing the mode of child delivery key being the prepayment mechanisms. Other factors included are the characteristics of the women with a focus on the social determinants of health, the choice of medical facilities and medical personnel amongst others. The study serves as an illustration that in many cases, increased prepayment mechanisms is a key factor to increased medical services and potentially overuse beyond medical necessity among other factors.

Kenya is a growing economy which in 2014 moved from a Low-Income Country (LIC) to a Low- and Middle-Income Country (LMIC) (Health Policy Project, 2016). Its Capital City, Nairobi hosts 4.39 million people of which 2,204,376 are female (50.1%) and 2,192,452 are male (49.8%). (Kenya National Bureau of Statistics, 2019). The research gaps that informed this study were intended to assess the extent to which the national

challenges of the healthcare system for example on healthcare financing would affect healthcare services like child delivery including the mode of delivery. The research gaps considered non-medical factors that influenced healthcare services like maternal care on the mode of child delivery. Considering the key pillars of healthcare systems, how did healthcare financing of prepayment mechanisms contribute to the mode of child delivery as well as other factors like the social determinants of health and the contribution of health facilities and medical workers in the mode of child delivery? Some of the gaps that arose therefore included the lack of much information on the factors influencing mode of child delivery in Nairobi County. There have been studies of other counties, others are around hospital-based studies, others focus on rural areas and others focus on the factors influencing the place of delivery.

With Nairobi being a cosmopolitan city with the largest population of all counties, lowest average household size of 2.9, largest population density of 6,247 as at 2019 population census and a female population of 50.1% of the total county population (Kenya National Bureau of Statistics, 2019), the study sought to explore what factors may influence the mode of child delivery, especially in this urban city. The city also has one of the highest numbers of healthcare facilities and medical personnel employed by government and faith-based organizations or non-governmental organizations being 8,752 (Ministry of Health, 2014) so the study sought to explore what non-medical factors would influence mode of child delivery in the county.

Opportunities for further studies however would lie with future comparative studies on how these findings would differ from rural areas and possibly other counties.

1.3 General Objective

The general objective of this study was to examine the factors that influence the mode of Child delivery in Nairobi County.

1.3.1 Specific Objectives

i. To establish the key factors that influence the mode of child delivery in Nairobi County.
ii. To identify the characteristics of women who opt for normal delivery and those that opt for C-sections in Nairobi County as factors influencing the mode of child delivery.
iii. To establish the financial implications of the factors influencing the mode of child delivery

1.4 Research Questions

i. What are the key factors influencing the mode of child delivery in Nairobi County?
ii. What are the characteristics of women who opt for normal delivery and those who opt for C-section delivery in Nairobi County as factors influencing the mode of child delivery?
iii. What is the overall financial implication of the factors influencing the mode of child delivery?

1.5 Scope of the Study

The population of interest was women of childbearing age in Nairobi County between ages 15 years to 49 years that had given birth to a child in the last three (3) years. The groups formed a mix of women who have sought child delivery services on an OOP basis and those that have had a prepayment mechanism catering for their medical expenses.

The scope of the study sought to explore what factors affect the choice of child delivery (normal or C-section delivery) once the choice of a preferred healthcare facility has been determined. The data was sampled from private healthcare facilities of various levels in Nairobi County over 36 months. Further, the study sought to determine the characteristics of the women who have sought normal deliveries vs C-section deliveries from the social determinants of health perspective.

1.6 Significance of the Study

In an already grossly underfunded healthcare system, the study sought to establish the factors influencing the mode of child delivery with special reference to non-medical factors like prepayment mechanisms amongst others. Further, the study sought to highlight impediments that such practices as moral hazards, amongst several others, bring to the healthcare system and provide recommendations on approaches of how best the stakeholders can collaborate to achieve long term sustainable models in healthcare, reduce OOP while still achieving quality, accessible and cost-effective healthcare services. In addition, it sought to share insights and illustrate that increased C-section rates, for example, can impact overall healthcare costs through increased expenditure on healthcare financing options like prepayment mechanisms.

The failure to understand the correlation between such key factors for example prepayment mechanisms and the health-seeking behavior reduces the ability of the policymaker and the healthcare system to come up with ways of reducing unnecessary costs borne by the prepayment mechanisms for example. For the prepayment mechanisms, the study is supposed to enable them to reposition to more strategic purchasing with clear policies and guidelines and clear directions on how to achieve sustainable healthcare financing.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Most insurance companies in Kenya provide medical insurance coverage on a fee for service reimbursement basis. This creates the risk of healthcare service providers passing all their costs to the insurer no matter how inefficient their production of service. This system is a cost-plus pricing system (Henderson, 2015 pg. 83).

In the cost-plus environment, there is no drive for healthcare providers to seek more efficient methods of production, and patients have no motivation to engage providers who offer lower prices. The healthcare providers offer services at higher prices which are passed on to the third-party payers. In traditional markets where the individuals spend their own money, there is discipline on expenditure resulting in the efficient provision of goods and services. However, as long as consumers do not spend their own money, the medical market will remain inefficient. The desires of those who have insurance are distorted by the subsidy provided by their insurance. (Henderson, 2015 pg. 83).

In child delivery healthcare services, the amounts of reimbursement on the fee for service model for normal versus C-section delivery differ materially making the incentive for the healthcare provider greater towards the C-section delivery. The Kenya Medical Practitioners and Dentists board fee guidelines (Kenya Subsidiary Legislation, 2016) gives a price range of minimum to a maximum at Kes. 36,000 to Kes. 72,000 as the professional fee for the obstetrician/gynecologist for normal delivery while the rate for the C-section ranges from Kes. 96,000 to Kes. 180,000 for the obstetrician/gynecologist. This pricing model can influence the healthcare providers to lean more toward the higher rates than the lower rates.

2.2 Theoretical Foundations

2.2.1 Supplier Induced Demand Theory

Supplier induced demand (SID) can be defined as an effect of an imperfect medical market resulting from imperfect information by the patients where they are aware of their symptoms but lack the knowledge of what is causing their medical conditions. Due to lack of time and unwillingness to incur the expense to secure this knowledge for themselves, the patient will rely exclusively on the physician on the decisions of their medical conditions. The patient further assumes that when they delegate their healthcare decisions to the physician, the physician will protect the interest of the patient. However, this creates a dilemma for the physician who can persuade the patient to purchase more medical care than is needed. On the extreme spectrum, patients find themselves denied the right care because the net gains are not in the financial interest of the provider (Henderson, 2015 pg. 80-81).

The SID theory dates as far back as 1978 when Fuchs V. R. wrote his paper called "The supply of surgeons and the demand for operations". In the paper, he argues that the supply of surgeons and demand for operations across geographical areas in the United States of America (USA) in 1963 and 1970 led to the result that surgeons shift the demand for operations. A 10% increase in the surgeon/population ratio resulted in about a 3% increase per capita utilization. The differences in supply also seemed to have a perverse effect on fees, raising them when the surgeon/population ratio increases (Fuchs, 1978).

The theory of SID, however, remains highly debated and an empirical quagmire. The concept has attracted considerable attention in the health economics literature and a variety of conceptual models and empirical tests of SID have been reported in a diverse range of studies. Despite the intensive scrutiny, SID and its implications for health policy remain controversial. On one hand, the theory argues that doctors will not just use their 'discretionary power' to engage in demand-shifting or inducement activities such that their recommended care differs from that which an informed patient would deem appropriate. It is argued that the induced demand may take the form of an increase in the number of services or a change in the service mix provided to patients. The criticism against this theory argues that doctors are governed by medical ethics and institutional and regulatory

frameworks. However, those supporting the theory also argue that there are external drivers of behaviour affecting for example the patient, clinical uncertainty, level of doctor remuneration, defensive medicine, environmental influences, etc. (Bickerdyke, Dolamore, Monday and Preston, 2002)

This study in its effort to examine the factors influencing modes of child delivery seeks to identify the role of the type of the healthcare facilities and the medical personnel in the mode of child delivery selected by the women in Nairobi County. The study has focused on private healthcare facilities and private doctors, hospital doctors and midwives. It, therefore, wishes to understand what correlations exist if any.

2.2.2 Moral hazard theory

Economists argue that in a contract, moral hazard occurs anytime there is an opportunity to benefit by acting differently from the implied principles of the contract. It further suggests that there is always a chance that a contract will change the risk behavior of one or both parties involved. For example, a fully insured patient will more likely consume the benefits more and similarly, a physician rendering care will give the service knowing the patient is fully insured. In a case of an uninsured patient, the patient will be more careful about the services rendered by even considering if they are necessary and the physician is more likely to take the patients financial situation into consideration when rendering service. It is argued by some however that this behavior is a result of more rational economic behavior than moral turpitude (Henderson, 2015 pg. 182-184).

Another perspective is that moral hazard refers to an increase in the expected costs due to individuals and firms behaving more casually upon the purchase of insurance. An organization or individual with insurance may change behavior and increase the loss relative to what it would have been without coverage. As the insurer cannot predict this behavior and relies on past loss data to estimate the distribution of claim payments, the insurers introduce deductibles, coinsurance and upper limits of coverage on the benefits to mitigate the impact of the expected losses and reduce the moral hazard (Howard and Erwann, 2014).

Although dating back to the 17th Century, the theory of moral hazard was the subject of renewed studies by Economist Kenneth Arrow in 1963. Arrow had considered why the market was not providing "optimal" insurance coverage, given that many medical services were not covered by insurance and that many people had no health coverage at all. A fellow Economist, Pauly's argued that full coverage may not be optimal when consumer demand for health care responds to the reduced marginal cost of care to the individual. With full insurance, people would demand more services, even ones that had only marginal value. Because these services would cost perhaps as much to produce as others, society would suffer a welfare loss from this excessive amount of health insurance coverage (Rice, 2014).

This study in its examination of factors affecting modes of child delivery has focused on prepayment mechanism as a key factor affecting the mode of child delivery. Ultimately a key non-medical decision a woman must make is on how the medical expenses will be paid. The moral hazard theory argues that where patients are cash-paying on the out-of-pocket basis, there is more care in the financial decisions both by the woman and medical personnel however where a payer is involved as the third party, there is less caution on the costs. The study seeks to examine how this theory applies to the factors contributing to the mode of child delivery. Further, in the objectives of the financial implication of the factors affecting the mode of child delivery, the study seeks to identify the implications of this theory.

2.2.3 Social determinants of health theory

Social determinants of health are conditions under which people are born, grow, live, work, and age. The factors that strongly influence health outcomes include a person's access to medical care, nutrition, clean water and other operational utilities, education and literacy levels, social and physical environment, ethnicity and cultural orientation, family and other social support, gender, housing and transport resources, occupation and job security, social stressors, social and socioeconomic status, spiritual values and several other factors. Medical personnel need to learn how to identify and address the social determinants of health to promote good health outcomes for individuals and populations. With population-based and evidence-based policymaking, current and future research on

social determinants of health can be facilitated to address effective interventions to reduce health inequities and the medical personnel roles in enriching the social determinants of health (American Academy of Family Physicians, 2013).

The World Health Organisation describes this theory as being informed by key directions in the founding social epidemiology theory. The three main theoretical directions invoked by current social epidemiologists, which are not mutually exclusive, can be designated as psychosocial approaches, social production of disease/political economy of health and eco-social theory and related multi-level frameworks. All three approaches seek to explain principles capable of explaining social inequalities in health (Solar and Irwin, 2010).
At society level, these theories focusing on social determinants of health with emphasis on psychosocial factors argue that steep hierarchies in income and social status weaken social cohesion and disintegrate social bonds which are negative for health. The propagators of the social production of disease/political economy of health argue that interpretation of links between income inequality and health must begin with the structural causes of inequalities, and not just focus on perceptions of that inequality. The effect of income inequality on health reflects both lack of resources held by individuals and systematic under-investments across a wide range of community infrastructure. In the eco-social theory and related multi-level framework, Krieger's notion of "embodiment" describes how "we literally incorporate biological influences from the material and social world" and that "no aspect of our biology can be understood or divorced from knowledge of history and individual and societal ways of living" (Solar and Irwin, 2010).

This study seeks to therefore examine the correlation of this theory to the mode of child delivery through its research objective of identifying the characteristics of the women who opt for the various modes of delivery. Key social determinants of health include income, occupation, age, medical access, education, etc. The study wishes to understand how and to what extent these social determinants of health affect the mode of child delivery.

2.3 Empirical Literature

2.3.1 Moral hazard and Supplier induced demand.

C-section rates have increased gradually across the world and with no significant material or perinatal benefits supporting them. Beyond a certain threshold, the increasing C-section rates may be associated with increased maternal and perinatal morbidity and increased significant healthcare costs. One of the recommendations made is on financial strategies aimed at reducing unnecessary C-sections births. This entails having insurance reforms that equalize the physician fee for various modes of delivery upon rigorous research by the healthcare professionals and the healthcare organizations (World Health Organization, 2018).

In the United States of America in 2013, a study conducted showed that nearly one in three births were delivered by C-section up from one in five in 1996. In addition, the differences in C-section and normal deliveries resulted in annual medical costs from childbirth increasing by $3 billion more than in 1996. The findings suggested that to date there are unexplained variations in C-section rates in various locations, places and practices even upon review of clinical and demographic factors and that over time it had led to speculation that non-medical factors were at work. In the study, a chief obstetrician of a healthcare facility noted that C-section births ended up being profit centers in hospitals so there was no incentive to reduce them. The hospitals were also noted to have much higher rates for C-sections thus much higher incentives to perform them. The study also observed that where the physicians were paid by salary, for example in a Health Management Organization (HMO) setting, the physician and hospital performed more normal deliveries in place of C-sections since the hospital is owned by the insurance company which internalizes the cost of care provided. In conclusion, this study found that 10% of C-sections represented overuse of healthcare which was not only costly but had an adverse impact on patients. This study which originally analyzed the rate of C-section deliveries between physician women and non-physician women suggested that due to the higher knowledge on delivery options among physician women, the C-section delivery rate was lower. It concluded that if all non-physician patients were treated like the physician patients, USA would nearly achieve the US Governments healthy people 2020 goal of

reducing C-section deliveries by 2.6%. While the above findings pointed to supplier induced demand in several areas, the study also made note of other contributing factors to increased C-section rates like maternal preferences, convenience and malpractice concerns (Johnson et al, 2016).

In a journal on the relationship between private insurance and high rates of C-sections in Chile (Murray, 2000), it was found in a post-natal survey that women with private obstetricians showed constantly higher rates of C-sections (range 57% - 83%) than those cared for by the midwives or doctors on duty in private or university hospitals (range 27% - 28%). This was against the background that private health insurers in Chile require the primary maternity care provider to be an obstetrician. The private maternity patients became a lucrative source of income thus the obstetricians attended to these private births in person and programming or scheduling of the births became a common time management strategy. The rates of elective C-sections were 30% - 68% in women with private obstetricians and 12%-14% in women not attended to by private obstetricians. The journal noted that policies on healthcare financing can influence maternity guidelines and outcomes in unforeseen ways.

In rural China, the high C-section rate was found to be primarily because of C- sections performed as non-emergency (Long, Klemetti, Wang, Tao, Yan and Hemminki, 2012). Half the procedures had been recommended by the doctor and half by the women themselves. Rural health insurance became associated with having non-emergency C-sections. The journal documents that health insurance may influence both physician and women decisions resulting in overuse in C-section. Another similar article on the impact of alternative reimbursement strategies in the new cooperative medical scheme on C-section delivery rates (Huang, Tao, Bogg and Tang, 2012) documented that the exorbitant costs associated with C-section delivery had been a great challenge for several families in rural China however since the re-establishment of the New Cooperative Medical Scheme (NCMS), aimed at reducing barriers of access to healthcare and reduce the financial burden of OOP, there seemed to have been increased C-section rates. The study found that the decisions on C-section deliveries came largely from the pregnant women and that while NCMS had introduced strategies to contain the costs and affect the choice of

delivery, the findings were that it was a daunting challenge to control C-section delivery solely by relying on financial reimbursement guidelines from the health insurance scheme. More effective interventions needed to include evidence-based health education programs for both patients and health professional staff. These should be established to reduce the C-section rates to an acceptable level as recommended by WHO.

While the debates bring out an array of issues, a Lancet article (Wagner, 2000) highlights a common reason offered for high rates of CS being "defensive obstetrics". In a survey by the study, 82% of physicians opted for C-section to avoid negligence claims. The doctors argued that bad birth outcomes led to suits in which the doctors found themselves criticized for not opting for interventions such as C-Section. The article further highlights another argument for increased C-sections being daylight obstetrics. UK and US studies had shown that emergency C-sections were skewed in favour of weekdays and daylight. C-section births take 20 min while with a vaginal birth the doctor is in the hospital or on call for twelve hours or more. In systems such as those of the USA, Canada, Belgium, and Brazil where obstetricians do primary maternity care, including routine prenatal checkups and attending normal births, the convenience of C-sections is vital to their practice. Other perspectives pointed out in the article were on the financial benefit of C-section deliveries to doctors and hospitals as the money from C-sections was nearly always much more than from a vaginal delivery. The article pointed out concern by WHO in a report that stated that "In the United States the profit motive explained hospital-specific cesarean section rates that were high even by United States standards". The report further observed that in private health care, C-section was one of the most common major surgical procedures, filling beds and operating rooms and providing important income.

The above studies illustrate the moral hazard and supplier induced demand contributions to the factors influencing the mode of child delivery key being the prepayment mechanisms, type of medical facility and medical personnel, etc.

2.3.2 Social and other determinants of health

A few different perspectives are extended on this subject to demonstrate that non-medical factors that drive the increase of C-sections are not exclusive and are more often co-related. In the study of the association between the type of health insurance and elective C-section deliveries in New Jersey between 2004-2007 (Marco, 2011), the journal concluded that insurance status had a small, independent impact on whether a woman without a previous C-section proceeded to labor for normal delivery or had a C-section delivery without labor. The other factors contributing to these outcomes (normal vs C-section delivery) though scanty however plausible especially in women of higher socioeconomic strata were maternal choices on things like convenient scheduling of births, concerns of pelvic floor preservation, fear of delivery pain maybe from previous negative birth experiences, beliefs that C-section is safer for the baby. The journal argued elective C-section deliveries may also reflect the hospital preferences for faster less variable birthing schedules, more "efficient" use of operating rooms and other hospital resources.

The findings pointed out that proper data in hospitals that inform the pre-labor C-section deliveries were important to determine what constituted high-risk conditions as most (94%) indicated that the C-section was necessary. Proper policy mechanisms to correctly affect women with insurance to avoid a negative impact on the finances at all times were recommended. Re-engineering of the fee for service model was also recommended as an important consideration to reduce physician induced demand. Education to women was also emphasized for those whose maternal request affected the rate of C-sections.

An assessment of the various studies above demonstrates that there is an increased C-section delivery rate in women with prepayment mechanisms than those without any. The studies argue that the global rise of C-sections over the years has raised concerns over the appropriateness of the usage of the procedure and that such increases and variations cannot be supported by clinical factors alone. Evidence from these studies suggests that additional factors are affecting the rise. Financial incentives such as high payments for C-sections, specifics of reimbursement arrangements linked with private insurance seem to influence supplier behavior (physician or hospital).

Another perspective from the Lancet article (Wagner, 2000) was that the study had found that in the US, women most likely to receive a C-section were white, married, have private health insurance, and give birth in private hospitals. The article further argued that the right to choose the various modes of delivery was dependent on proper full unbiased information on the risks and benefits of the various modes of delivery. The article concludes that C-section was an expensive and dangerous luxury that deprived some countries of much needed medical resources when a woman chose to have an elective C-section as the resources required would deprive other potential women in greater need of these resources.

The above reviews highlight key issues around social epidemiology and the social determinants of health on the factors influencing the mode of child delivery. The mode of healthcare financing especially around prepayment mechanism. The reviews bring out observations that women with higher income may have better options to healthcare financing and may therefore opt for C-sections that may be higher in cost. Also, women with access to prepayment mechanisms like private insurance had access to private hospitals and decisions on C-section would be easier to pay for. Education levels also comes out strongly in these reviews especially from the point of full unbiased information on the benefits and risks of C-section.

2.4 Gaps from the empirical studies reviewed.

The empirical literature brings out interesting findings on the non-medical factors contributing to the mode of child delivery. With most of the literature showing the trends in developed markets, the study seeks to examine how reflective these trends are in Kenya and especially in the urban setting of Nairobi County. Healthcare financing through prepayment mechanisms has also grown over the years significantly. The private health insurance market in Kenya wrote a business revenue of Kes. 42.3 billion in 2019 (Insurance Regulatory Authority, 2019). The industry has seen significant growth from a business revenue of Kes. 3.5 billion in 2006. Similarly, NHIF has also grown its business revenue to Kes. 47.8 billion in 2017/2018 from Kes. 3.1 billion in 2006/07. So what has the impact of such contributing factors been on healthcare services like child delivery?

The study seeks to identify if such changing factors affect the mode of child delivery. Similarly, the study has observed challenges on the moral hazard theory related to prepayment mechanisms and seeks to identify if such trends bear the same impact in Nairobi County, Kenya.

From the supplier induced demand theory, where women have access to private healthcare facilities, what is the role of the type of hospital as well as the medical personnel on the mode of child delivery? The literature review presents some interesting findings from the various markets. It would be important to examine if these factors apply in Nairobi county. In this regard also, it seeks to explore the extent to which social determinants of health affects the decisions of women in the mode of child delivery.

In conclusion, the study seeks to examine the factors contributing to the mode of child delivery in Nairobi County where very little information on this discussion is available.

2.5 Summary of the literature review

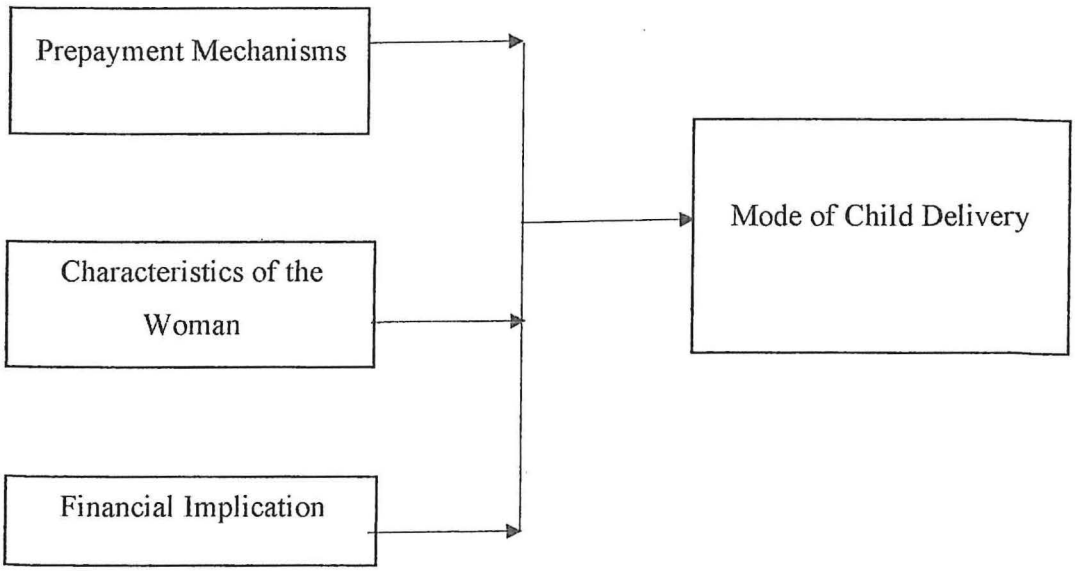
The global studies widely demonstrate that there are growing and diverse factors that point to the fact that the mode of child delivery is determined by more than just medical factors and that the rising trend of C-section deliveries leaves many researchers with reason to believe that there are other factors at play. These factors contribute to increased healthcare costs with moral hazard and supplier induced demand as well as other determinants of health including social determinants affecting the costs of maternal healthcare. These studies highlight the challenges and recommend correction of the outlined anomalies.

It is on this premise that this study sought to establish the factors influencing the mode of child delivery in Nairobi County. The research sought to determine if the same trends apply locally as they do globally and point out the contributing factors including highlighting the fact that these factors go beyond medical reasons. The study appealed to addressing this anomaly in order to ensure overall long-term sustainability of healthcare costs for prepayment mechanisms and the overall healthcare system.

2.6 Conceptual Framework

The framework below shows the relationship between the various factors contributing to the mode of child delivery.

Figure 2.1: Conceptual Framework



The study seeks to examine key factors influencing the mode of child delivery. The study has identified certain key factors that have formed the independent variables of this study.

Prepayment mechanisms are identified as a key independent variable as it informs an important non-medical factor. It highlights that medical financing is a key contributor to the decisions around the mode of child delivery especially when it comes to answering the question of who is bearing the cost of the mode of child delivery. The moral hazard theory points out that in cases where such modes of financing exist, the probability of more use of the medical services arises and in some cases overuse. The type of healthcare facility and the medical personnel are another key factor that contributes to the mode of child delivery. The theory of supplier induced demand seeks to weigh into the matter in helping establish if this is the case and to what extent.

The characteristics of the woman are core social epidemiology perspectives that investigate how social interactions and social conditions impact the public's health. This informs the social determinants of health where the age, income level, occupation, education level, medical access, etc contribute to the decision the woman makes in the mode of child delivery.

The financial implications of the mode of child delivery considers the financial impact of non-medical decisions on the overall health system at population level or in various segments for example the prepayment mechanisms. For a country like Kenya with a high unemployment rate and high out of pocket expenditure on medical, the study seeks to highlight the impact of such trends and highlight the need to address long term sustainable health decisions not influenced by such theories as supplier induced demand and moral hazard.

2.7 Operationalization and Measurement of Variables

Table 2.1: Operationalization and Measurement of Variables

Variable Type	Variable	Indicators	Measurement	Data Collection Method	Theories	
Dependent Variables	Mode of Child Delivery	• Mode of payment • Economic status • Medical doctor's recommendations • Previous delivery • Preferred mode of delivery • Education on delivery modes	• Quantitative	• Questionnaire	• Moral Hazard • Supplier Induced Demand • Social Determinants of Health	• Henderson, 2015 pg. 83 • Fuchs, 1978 • Bickerdyke, Dolamore, Monday and Preston, 2002 • Howard et al, 2014 • Rice, 2014 • Solar, Irwin, 2010
Independent Variables	Prepayment Mechanisms	• Income level • Source of income	• Quantitative • Scale	• Questionnaire	•	• Solar and Irwin, 2010
	Characteristics of the woman	• Age • Income Level • Access to funds for delivery • Level of Education • Education on delivery options • Previous delivery • Preferred mode of	• Quantitative	• Questionnaire	•	•

		delivery				
	Financial Implication (Healthcare Facility & Practitioners)	• Private or hospital doctor • Other medical personnel assisting in the delivery. • Cost of delivery	• Quantitative • Secondary data	• Questionnaire • HRMIS	•	•

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section sought to fulfil the research objectives that include establishing the factors influencing the mode of child delivery in Nairobi County and identifying the characteristics of the women who opt for normal delivery and those who opt for C-section delivery. This is in a quest to establish solutions to the research questions that can positively contribute to the long-term financial sustainability of healthcare services such as maternal health. The purpose of this section is to define the research philosophy and expound on the various research methodologies.

3.2 Research Philosophy

Research philosophy deals with the source, nature and development of knowledge. It is a belief about how data about a phenomenon should be collected, analyzed and used. The research philosophy of this study was positivism as it focused on data collection of highly structured large samples, measurement and interpretation of the same using quantitative data collection methods. This philosophy can also use qualitative methods. The sources included primary data methods like the questionnaire from the survey method and secondary data from the health records management information systems (HRMIS) of the hospitals. This research philosophy depends on quantifiable observations that leads to statistical analyses primarily (Dudovskiy, 2018).

Positivism holds that quantitative analyses are of various types, as numbers show the research conclusions based upon certain mathematical processes. It is believed that mathematics is truth and can withstand attacks upon its conclusions if the uses of proven mathematical processes are shown. The approach is criticized that qualitative analyses, however, are being accepted more and more as a basis for valid and true conclusions, and these conclusions have been brought about by using logical processes. While positivists

may underestimate the value of qualitative analyses, they are no longer underestimated as they have been historically (Yee and Khin, 2010).

3.3 Research Design

This is the general plan that seeks to answer the research question and included the research strategy and methods of data collection and analysis (Dudovskiy, 2018). This research took a conclusive research design whose purpose was to be specific to verify insights and help chart the course of action. The data sources are also well defined, that is, primary data sources from questionnaires and secondary data sources from the HRMIS of the hospitals. This structure of the data was also defined in the questionnaire and the templates of datasheets to be used. Further, the design took descriptive research under the conclusive research design as it aimed to reveal the current issues through a process of data collection that enabled a comprehensive elaboration of the situation. It also sought to describe the characteristics and/or behavior of the sample population (Dudovskiy, 2018).

Descriptive research is used to describe functions or characteristics of a phenomenon and can be further divided into case studies, case series studies, cross-sectional studies longitudinal studies and retrospective studies. This study focused on the cross-sectional study group which is a type of research design in which you collect data from many different individuals at a single point in time. The approach was used as it is cost effective and allowed collection of information at a single point in time (Thomas, 2020).

3.4 Population and Sampling

A population is a complete set of elements (persons or objects) that possess some common characteristic defined by the sampling criteria established by the researcher. It commonly contains too many individuals to study conveniently, so the investigation is often restricted to one or more samples drawn from it (Swinscow, 1997). Sampling can be explained as a specific principle used to select members of the population to be included in the study. It has been rightly noted that because many populations of interest are too large to work with directly, techniques of statistical sampling have been devised to obtain samples taken from larger populations (Dudovskiy, 2018).

The target population of the study was 1.405 million women in Nairobi County (Kenya National Bureau of Statistics, 2019) that are of childbearing age between 15 years to 49 years. The sampling frame was women that have given birth to a child in the last three (3) years. Specifically, these women should have sought delivery services at various healthcare facilities and whose mode of payment has been OOP or a prepayment mechanism. The women were from various sub-counties of Nairobi County who would have sought delivery services from various healthcare facilities within the county. The sampling method applied was a simple random method in probability sampling. The simple random sampling is simple as the members are selected randomly. It was also a cost-effective model for this study.

The sample size formula was derived as follows:
Where,

- N = Population size. The female population of childbearing age between 15 to 49 years – 1.405 million is 63.7% of the total female population in Nairobi County.
- Z = Critical value of the normal distribution at the required confidence level. The confidence level sought is 95% therefore Z will be 1.96.
- p = Sample proportion where uncertain is 0.5
- e = Margin of error is 8% i.e., 0.08

Particular	**Value**
Population Size (N)	1,405,171
Critical Value (95% confidence level) (Z)	1.96
Margin of Error (e)	0.08
a) Sample Proportion (uncertain) (p)	0.5
Sample Size(n)	**150**

A sample size of 150 enabled us to conclusively draw inferences of the population and obtain a true population proposition with the above assumptions on the margin of error and confidence level.

For other quantitative data, secondary data was obtained from records in the HRMIS of the healthcare service providers, the sampling frame was various private healthcare facilities in Nairobi County who were at different levels. This proposed selection of providers forms a quota, non-probability sampling method because it is targeted at finding the hospitals that are at different levels in terms of infrastructure and capabilities and the clientele of the women the facility would attract primarily by income groups. Further, the sampling seeks to identify hospitals with different hospital management models and that are ranked at different levels.

3.5 Data Collection Methods

According to Dudovskiy (2018), data collection is a process of collecting information from all the relevant sources to find answers to the research problem, test the hypothesis and evaluate the outcomes.

The research applied the primary and secondary data collection methods which were quantitative. The method of quantitative data collection which was applied included questionnaires with closed-ended questions and a few open-ended questions which sought to sample primary data on which mode of child delivery the women had and the characteristics of these women against the choices of delivery they sought both on medical and non-medical grounds.

The questionnaire was designed using the google form tool and it was shared to various WhatsApp groups and individuals. The women who received these links were encouraged to also share with the women of the target age. Even men were encouraged to share with their female friends, spouses or relatives. This exercise took about two weeks. When the responses slowed down, the message would be sent to other WhatsApp groups and individual members previously not engaged. This was necessitated by the restricted movements imposed by the Government during the Covid-19 lockdown and further the guidelines on reduced physical documents to reduce physical contact that would

necessitate sanitizing of records. The respondents would complete the form upon opening the link – Questionnaire on Women's maternal health choices (https://forms.gle/41XgB3QPFVFUeuDS6). The first part of the questionnaire had a confidentiality statement and voluntary consent which was compulsory to accept upon reading the terms and conditions before proceeding to complete the form. Upon completion, the respondents submit the document which would be received on the google form respondents' section linked to the researcher's google account.

In addition, secondary data was obtained from the healthcare facilities HRMIS to analyze the patient records on the parameters of the mode of delivery, age, the prepayment mechanism type of doctor and previous deliveries. The researcher shared the required fields with the hospitals and the data extracted from the hospital HRMIS sought to comply with the requirements. The data would be emailed to the researcher's email address upon approval by the hospital management who had authorized the release of the information. The data analysis was based on mathematical calculations in various formats and included an analysis on mean, correlation and regression analysis and others.

3.6 Data Analysis

The quantitative data was provided by the hospitals in excel sheets as data extracts from their HRMIS. This information was analyzed and represented in the forms of tables and graphs. The information that was collected included a unique reference number of the patient (this ensured patient confidentiality), the age, the count of deliveries (previous and current), date of admission, date of discharge, the payer (private health insurer, NHIF, a fund administered scheme), type of delivery, hospital package or private doctor patient and total invoiced amount.

The data analyzed and represented included information on the mode (most frequent) of the delivery types (normal or C-section delivery) within 36 months on a year-on-year basis. This also included statistics on the total count of patients that have had a normal or C-section delivery. The study also analyzed the delivery type both normal and C-section by age bands by counts and also by the percentage to give more insight to the analysis. The study also analyzed by count and percentage the patients who were on OOP versus those with prepayment mechanisms within the last 36 months on a year-on-year basis. The

data was presented in tables and graphs. Other parameters analyzed included the mean of normal delivery and C-section over the 36 months on a year-on-year basis.

The tool used was Statistical Package for Social Sciences to analyze the data. All this analysis aimed to find evidence to either support or challenge the research questions and objectives. The analysis process also refers to the findings of the literature review in making comparisons to our findings. The application of secondary data plays an important role in the study in terms of increasing the levels of research validity and reliability.

3.7 Research Quality

3.7.1 Validity

Research validity refers to how well an instrument measures what it is intended to measure. It can be divided into two groups i.e., internal and external where internal validity refers to how the research findings match reality, while external validity refers to the extent to which the research findings can be replicated to other environments. The research entailed comparing the primary and secondary data obtained with the literature review to compare what was found and see how the research resembles what is happening in the real world.

The study employed construct validity, a type of research validity that relates to the assessment of the suitability of measurement tool to measure the phenomenon being studied. The application of construct validity can be effectively facilitated with the involvement of a panel of 'experts' closely familiar with the measure and the phenomenon. In the case of this study, we allowed subject matter experts including my supervisor to review and validate the information and measurement tools. Other forms of research validity also included formative validity which refers to an assessment of the effectiveness of the measure in terms of providing information that can be used to improve specific aspects of the phenomenon. Throughout the presentation of research findings, the data interpreted shed light on gaps like the medical personnel used and their correlation to the mode of child delivery presenting a possible weakness to the phenomena in the primary data. From the secondary data, the high rates of C-section with almost similar parity to the normal delivery highlighted areas of possible challenges needing solutions (Dudovskiy, 2011).

3.7.1 Reliability

According to Dudovskiy (2018), reliability refers to the extent to which the same answers can be obtained using the same instruments more than one time. If the research is associated with high levels of reliability, then other researchers need to be able to generate the same results, using the same research methods under similar conditions.

The reliability test of Cronbach's alpha was applied to measure reliability or internal consistency. The SPSS tools were used to derive this. As a rule of thumb, it is understood that an alpha $0.8 > \alpha \geq 0.7$ will have an internal consistency that is acceptable while an alpha $0.9 > \alpha \geq 0.8$ will have a good internal consistency. Any figures below or above are considered questionable due to the low number of questions or redundant questions caused by repetition (Tavakol, M. and Dennick, R, 2011).

However, reliability alone is not enough, measures need to be reliable, as well as valid. A measure is reliable if it presents the same results however the same may not be valid i.e., actual to the reality so both these must be assessed hand in hand (Dudovskiy, 2011).

3.8 The Empirical Model

This model sought to examine the factors influencing the mode of child delivery in Nairobi County. From the conceptual framework, the model outlines that the mode of delivery is a function of various independent variables being prepayment mechanism, characteristics of the women and financial implications. It seeks to determine for example the influence of moral hazard on the financial implications, the characteristics of the women and the prepayment mechanism influence. In addition, it examined the impact of the doctor for example on supplier induced demand.

However, for these functions, the sign cannot be determined a priori.

$$Md = f(Pm, Cm, Fi, \ldots\ldots\ldots)$$

Where

Md is the mode of delivery,

Pm is the prepayment mechanism.

Cm is the characteristics of the women.

Fi is the financial implications.

Characteristics of the women are assessed widely in this study for example. age can positively affect the mode of delivery. Younger women may opt for C-section more than the older ones and in the same breath, older women above a certain age may have higher pregnancy risks and therefore have higher C-section deliveries. This cannot be determined a priori.

The prepayment mechanism could positively affect the mode of delivery for example by way of a C-section. This is especially the case in the events of moral hazard or supplier induced demand.

The Financial Implication which assesses the overall implications of decisions made by the healthcare facilities affects the mode of delivery as in the case of moral hazard and supplier induced demand thereby affecting the overall cost of healthcare where the mode of child delivery is concerned.

3.9 Ethical Issues in Research

The Ethical approval was sought from Strathmore University Institutional Ethics Review Committee (SU-IERC) before the same was obtained from the national research body, National Commission for Science Technology and Innovation (NACOSTI). The intent of the research was shared with all the respective healthcare facilities for approval. This included a letter from Strathmore University informing them of the intention of the study and the details of the researchers.

For the survey data collection, an informed consent declaration statement formed part of the document. Members who chose to complete the questionnaire were also required to sign the informed consent declaration statement. All data obtained also sought on an anonymized basis to protect the patient identity and confidentiality. In addition, the anonymity of the organizations participating was also ensured.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

In this chapter, results are presented as per the study objectives. The outcomes are also interpreted and discussed regarding reviewed empirical literature in chapter two. The research aimed to examine the factors influencing the mode of child delivery in Nairobi County. The chapter starts by providing results on response rate. Second, findings on the demographic characteristics of the respondents are provided. Descriptive statistic results are then provided followed by correlation analysis results and finally, a multiple regression model is presented. Since the researcher analyzed both the primary and secondary data, the descriptive statistics of these are also presented in this chapter.

4.2 Response Rate

A total of 150 participants were engaged and the questionnaires were administered to the sampled respondents. Out of the 150 questionnaires, 138 were properly filled and returned. This represented a 92% response rate. According to Saunders, Lewis and Thornhill (2009), a return rate above 50% is adequate for analysis. As such, a response of 92% was sufficient for the analysis in this study.

4.3 Demographic Characteristics of the Respondents

In line with the objective of identifying the characteristics of women who opt for normal delivery and those that opt for C-sections as factors influencing the mode of child delivery, the background information relating to the respondents is provided in this section. The categories include age, marital status, level of education, occupation, income level and number of children.

4.3.1 Age of the Respondents

The respondents were asked to state their age and the results are shown in Table 4.1.

Table 4.1: Age of the Respondents; Normal vs C-section Delivery

Age	N	Minimum	Maximum	Mean
Normal	56	21	45	36.53
C-section	74	25	48	36.62

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling 130.

The findings in Table 4.1 indicate that on average, most of the respondents who went through normal child delivery were aged 37 years. The youngest was 21 years and the oldest was 45 years. Further, most of the respondents who went through C-section child delivery were an average age of 37 years. The youngest was 25 years and the oldest was 48 years. The age factor is expected to determine the mode of child delivery among women.

Research shows that if a woman 35 years old or older gets pregnant, they are considered to be of advanced maternal age (AMA). This can put a woman's pregnancy in the high-risk category for a few reasons, including an increased risk of complications for the mother and the baby. The chance that these complications can occur with future pregnancies only increases with the age. Of the women aged 34 years and below in this study, 58% had C-section as the mode of delivery while 42% had normal delivery as the mode of delivery. Further, of the women aged 35 years and above, 56% had C-section as the mode of delivery while 44% had normal delivery as the mode of delivery as shown in Table 4.2. The findings indicate that in both age groups (34 years and below and 35 years and above), more women had undergone C-Section than normal delivery. According to the Advanced Maternal Risk research, women above 35 years were considered at higher risk of pregnancy and therefore more likely to have higher rates of C-section however the primary data presented that higher rates of C-section were experienced across both age groups.

Table 4.2: Age of the Respondents and Risk of Delivery

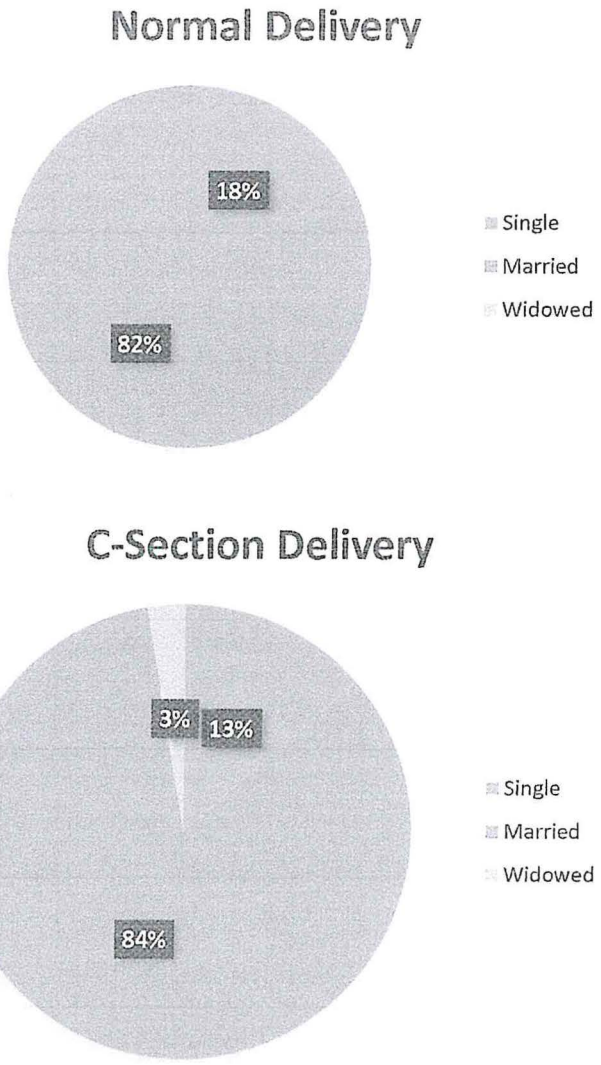
Age	N	34 years and below	N	35 years and Above
Normal	18	42%	38	44%

C-section	25	58%	49	56%

4.3.2 Marital Status

The respondents were asked to indicate their marital status and findings were as shown in Figure 4.1.

Figure 4.1: Marital Status; Normal vs C-section Delivery



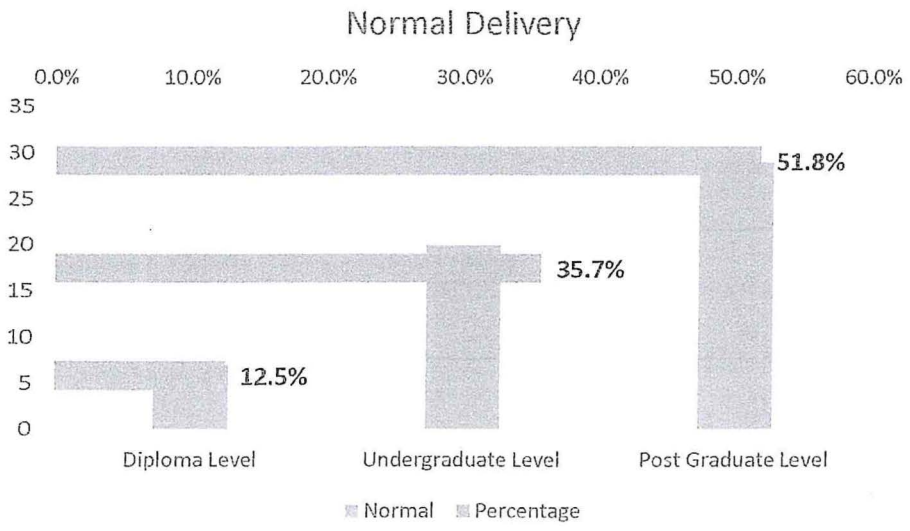
Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

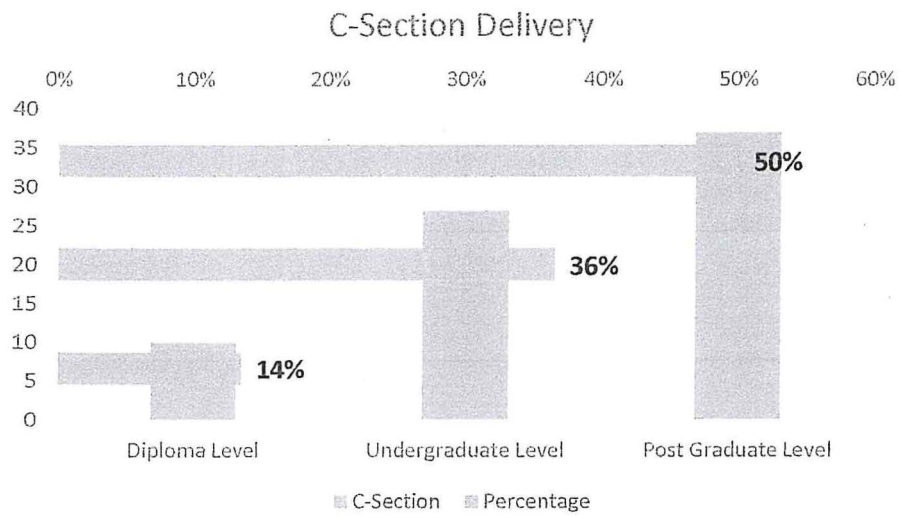
The findings indicate that 84% of the respondents who went through C-section child delivery were married, 13% were single, while 3% were widowed. On the other hand, 82% of the respondents who went through normal child delivery were married, while 18% were single. The findings imply that both groups of respondents have almost similar marital status and there are no key differentiators.

4.3.3 Level of Education

Figure 4.2 reveals the respondents' level of education.

Figure 4.2: Level of Education; Normal vs C-section Delivery





Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings indicate that 51.8% of the respondents who went through normal child delivery were postgraduates, 35.7% were undergraduates, while 12.5% were diploma holders. On the other hand, 50% of the respondents who went through C-section child delivery were postgraduates, 36% were undergraduates, while 14% were diploma holders. The findings imply that both groups of respondents have almost similar education levels and there are no key differentiators by level of education.

4.3.4 Occupation

This subsection provides results on the occupation of the respondents. The findings are shown in Table 4.3.

Table 4.3: Occupation; Normal vs C-section Delivery

	Occupation	N	%
Normal Delivery	Arts and Entertainment (Film, television, theatre, writing and related)	2	5%
	Business sector (Entrepreneurship, marketing, sales, process management, project management and related)	13	32%
	Education sector (Professors, teachers and related)	2	5%
	Finance sector (Banking, insurance, accounting and related)	9	22%
	Healthcare and Medicine sector (Medical profession and related)	11	27%
	Industry and Manufacturing sector (Engineering, production, quality control and related)	3	7%
	Legal sector (Lawyers, judiciary and related)	0	0%
	Science and Technology (Computer science, engineering, mathematician, geographers and related)	1	2%
	Total	**41**	**100%**
C-Section	Arts and Entertainment (Film, television, theatre, writing and related)	0	0%
	Business sector (Entrepreneurship, marketing, sales, process management, project management and related)	18	27%
	Education sector (Professors, teachers and related)	3	5%
	Finance sector (Banking, insurance, accounting and related)	25	38%
	Healthcare and Medicine sector (Medical profession and related)	10	15%
	Industry and Manufacturing sector (Engineering, production, quality control and related)	3	5%
	Legal sector (Lawyers, judiciary and related)	2	3%
	Science and Technology (Computer science, engineering, mathematician, geographers and related)	5	8%
	Total	**66**	**100%**

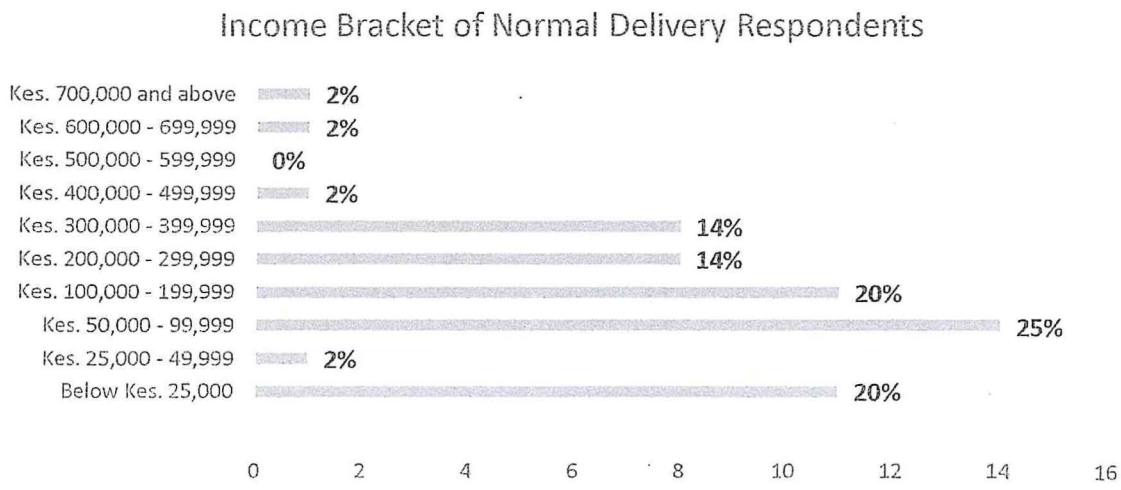
Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

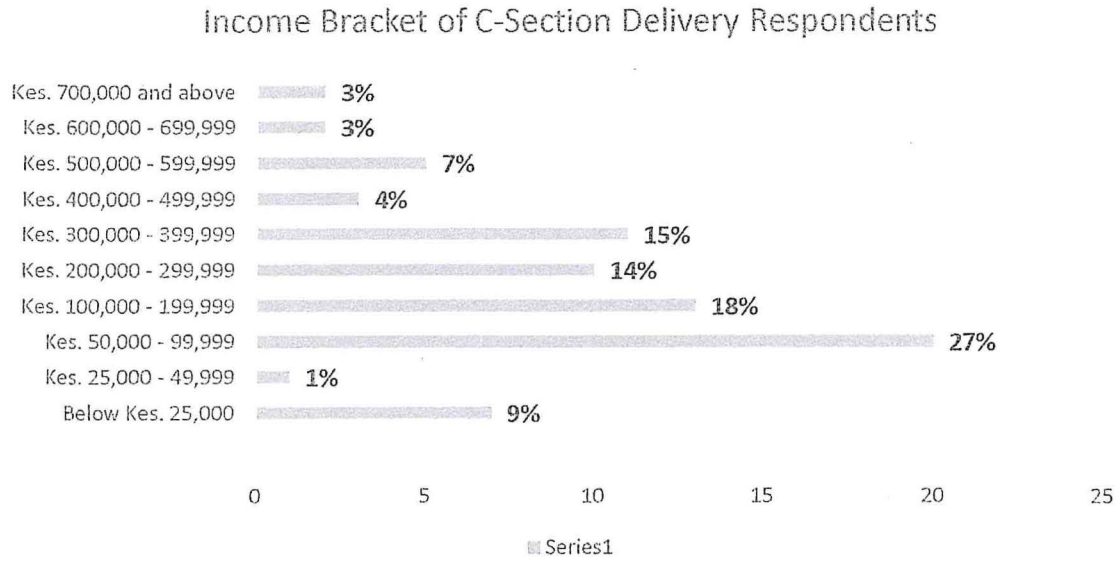
The findings in Table 4.3 reveal that 32% of the respondents who went through normal child delivery were in the business sector, 27% were in Healthcare and Medicine sector, while 22% were in the Finance sector. On the other hand, 38% of the respondents who went through C-section child delivery were in the finance sector, 27% were in the business sector, while 15% were in the healthcare and medicine sector. The findings imply that the occupational sectors with the highest frequencies are almost the same for both groups of respondents. However, it forms an interesting observation that by mode of child delivery, more respondents in the healthcare sector had normal deliveries (27%) than C-section deliveries (15%).

4.3.5 Income Level

This subsection provides results on the income level of the respondents. The findings are shown in Figure 4.3.

Figure 4.3: Income level; Normal vs C-section Delivery





Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings indicate that 25% of the respondents who went through normal child delivery earned between Kes. 50,000 – 99,999, 20% were earning below Kes. 25, 000 and Kes. 100,000 – 199,999, respectively. On the other hand, 27% of the respondents who went through C-section child delivery earned between Kes. 50,000 – 99,999 while 18% earned Kes. 100,000 – 199,999. The respondents in the income bands Kes. 50,000 to Kes. 199,999 had the highest frequencies for both normal and C-section births. In addition, respondents with Kes. 500,000 income level and above are more in the category of C-section mode of delivery (12%) compared to normal delivery (4%).

4.3.6 Number of Children

This subsection provides results on respondents' number of children. The findings are shown in Figure 4.4.

Figure 4.4: Number of Children; Normal vs C-section Delivery

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings reveal that 36% of the respondents who went through normal child delivery had two children, 32% had one child, 25% had three children, while 7% had four children. On the other hand, 39% of the respondents who went through C-section child delivery had two children, 35% had one child, 18% had three children, while 8% had four children. Previous deliveries can affect the subsequent choices of delivery. The findings imply that both groups of respondents have almost similar number of children and there are no key differentiators.

4.4 Descriptive Statistic Results on Maternal information

This section provides descriptive statistic results on maternal information. The specific descriptive statistics included frequencies and percentages.

Table 4.4: Descriptive Statistics on Mode of payment

	N	%
I paid the bills myself (cash/ out of pocket/loan/ contributions from friends or family)	40	28.8%
I paid through my/my spouse employer's insurance or my/my spouse employer's fund	92	66.2%
I paid through my/my spouse own private insurance purchased by myself/ family member	9	6.5%
I had NHIF pay my bills through my/my spouse employer scheme	27	19.4%
I had NHIF pay my bills through my/my spouse voluntary contribution	13	9.4%
I had NHIF pay my bills through the Linda Mama Scheme	4	2.9%

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130. Further, the respondents in this question had the option of selecting multiple modes of payment and therefore the number exceeds the number of respondents.

The findings in Table 4.4 indicate that 66.2% of the respondents settled the medical bills for their last child delivery through their/spouse employer's insurance or their/spouse employer's fund, 28.8% paid the bills themselves (cash/ out of pocket/loan/ contributions from friends or family), 19.4% had NHIF pay their bills through their/ spouse employer scheme.

Table 4.5: Descriptive Statistics on Mode of payment for Normal & CS Delivery

	N	Normal	N	C-Section
I paid the bills myself (cash/ out of pocket/loan/ contributions from friends or family)	14	17.28%	6	4.92%
I paid through my/my spouse employer's insurance or my/my spouse employer's fund	24	29.63%	42	34.43%
I paid the bill through insurance/NHIF/employer scheme	43	53.09%	74	60.66%

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130. Further, the respondents in this question had the option of selecting multiple modes of payment and therefore the number exceeds the number of respondents.

Further analysis reveals that of the respondents of normal delivery, 29.63% of the responses had pure employer insurance whether (their own or their spouse), 17.28% incurred a pure out of the pocket expenditure. Compared to the C-section counterparts, 34.43% of the selected responses had pure employer insurance (their own or their spouse) 4.92% incurred a pure out of the pocket expenditure. Other assessments of the respondents of normal delivery, 53.09% of the responses had some form of prepayment mechanism whether employer insurance, individual private insurance, NHIF, employer scheme or some hybrid of these options including out of pocket expenditure. Of the women who had C-Section, 60.66% of the responses had some form of prepayment mechanism whether employer insurance, individual private insurance, NHIF, employer scheme or some hybrid of these options including out of pocket expenditure.

Table 4.6: Descriptive Statistics on Type of Hospital

		Mode of delivery			
		C-section	Normal	Total	%
Type of Hospital	Government facility	3	3	6	4.6%
	Private Hospital	62	43	105	80.8%
	Faith based/Mission Hospital	9	10	19	14.6%
Total		74	56	130	100%

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings in Table 4.6 reveal that majority of the respondents (80.8%) preferred private hospitals, 14.6% used mission hospitals, while only 4.6% used government facilities. This implies that most women preferred private hospitals in their last delivery. The choice of private facilities can be attributed to several factors such as perceived quality services. On the other hand, as most of these respondents had prepayment mechanisms and especially employer insurance as the mode of payment, the selection of healthcare facilities mainly at private facilities would be informed by their mode of payment that mainly works with private healthcare facilities.

		Mode of Child Delivery					
		C-section		Normal		Total	Percenta
Medical Personnel	Private Personal Doctor	46	70%	20	30%	66	51
	Hospital Doctor	27	54%	23	46%	50	38
	Midwife	1	7%	13	93%	14	11
Total		74	57%	56	43%	130	100

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings in Table 4.7 indicate that majority of the respondents (51%) were delivered by private personal doctors during the delivery of their last child, 38% were delivered by hospital doctors, while 11% were delivered by midwives. Most respondents who delivered by C-section were delivered by private personal doctors (70%) compared to the hospital doctors (54%). In contrast, for the respondents who had normal delivery, the private doctor delivery was at 30% while the hospital doctor deliveries were at 46%

Table 4.8: Descriptive Statistics on Mode of child delivery

	Frequency	**Percent**
C-section delivery	74	56.9%
Normal/ Vaginal delivery	56	43.1%
Total	**130**	**100**

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings in Table 4.8 reveal that majority of the respondents (56.9%) delivered through C-section delivery, while 43.1% delivered using normal/vaginal delivery. The choice of mode of child delivery is likely to be influenced by several factors including prepayment mechanisms, characteristics of the women, type of healthcare facility and type of medical personnel.

Table 4.9: Descriptive Statistics on Choice of normal delivery

	N	%
Medical doctor recommendation	34	24.5%
Previous child delivery (normal delivery) led to me making the same decision	34	24.5%
Previous child delivery (C-section) led to me changing the decision	9	6.5%
Personal choice.	22	15.8%

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130. Further, the respondents in this question had the option of selecting multiple modes of payment and therefore the number exceeds the number of respondents.

The findings in Table 4.9 reveal that 24.5% of the respondents noted that their decision to have the normal delivery was informed by medical doctor recommendation and previous child delivery (normal delivery) respectively. Further, 15.8% cited personal choice while 6.5% noted previous child delivery (C-section). This implies that the choice of normal delivery is determined by several factors with the doctor recommendation forming a key component.

Table 4.10: Descriptive Statistics on Choice of C-Section

The study sought to identify what informed the decision to have a C-section delivery.

	N	%
Medical emergency (labor was not progressing, baby was in distress, other health concerns, medical obstruction, cord trapped against baby's body)	50	36.0%
Medical doctor recommendation	21	15.1%
Personal request to have this choice of delivery for personal reasons	5	3.6%
Fear of pain in normal/vaginal delivery	3	2.2%
Previous scar from previous C-section delivery led to me making the same decision	21	15.1%

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130. Further, the respondents in this question had the option of selecting multiple modes of payment and therefore the number exceeds the number of respondents.

The findings in Table 4.10 indicate that 36% of the respondent noted that their decision to have the C-section delivery was informed by Medical emergency (labor was not progressing, the baby was in distress, other health concerns, medical obstruction, cord trapped against baby's body), 15.1% noted medical doctor recommendation and 15.1% previous scar from previous C-section delivery.

Table 4.11: Descriptive Statistics on Key informing decisions to the mode of child delivery

The study sought to identify the key informing decisions on the mode of child delivery. The findings were presented as below.

	N	%
Decision of the doctor	82	59.0%
My preferred mode of delivery prevailed over the doctor's decision	40	28.8%
My/my spouse financial capability to finance the mode of child delivery	8	5.8%
My/my spouse personal insurance ability to cover the costs	4	2.9%
My/my spouse employer insurance ability to cover the costs	8	5.8%
My/my spouse National Hospital Insurance Fund (NHIF) ability to cover the costs	4	2.9%

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130. Further, the respondents in this question had the option of selecting multiple modes of payment and therefore the number exceeds the number of respondents.

The findings in Table 4.11 indicate that majority of the respondents (59%) noted that the doctor's decision was key in informing decisions to the mode of child delivery. 28.8% cited that their preferred mode of delivery prevailed over the doctor's decision. Further, 5.8% noted their/spouse financial capability to finance the mode of child delivery and their/spouse employer insurance ability to cover the costs, respectively.

The respondents were asked whether they received information on the various modes of delivery and the risks of each process whether normal/vaginal or C-section. Results are shown in Table 4.12.

Table 4.12: Descriptive Statistics on Education and Awareness

	Frequency	Percent
Maybe/Not sure/Can't remember	10	7.69%
No	28	21.54%
Yes	92	70.77%
Total	**130**	**100.00%**

Of the 138 responses received, 7 of them had incorrect dates of birth and one was above the targeted research age group. These are therefore not captured in the above numbers totaling to 130.

The findings in Table 4.12 reveal that majority of the respondents (70.77%) noted that they were informed on the various modes of delivery and the risks of each process, 21.54% said no, while 7.69% were not sure. Education and awareness about the various modes of delivery and the risks of each process is critical in determining the choice that women make on whether to deliver through normal or C-section delivery.

4.5 Correlation Analysis Results

This section provides findings on the correlation between the independent variables (prepayment mechanism, age, previous deliveries and medical personnel) and dependent variable (mode of child delivery). The correlation analysis was used to show the relationship between variables in terms of strength and direction. Results are shown in Table 4.13.

Table 4.13: Correlation Results

		Mode of Child Delivery	Prepayment Mechanism	Age	Previous deliveries	Medical Personnel
Mode of Child Delivery	Pearson Correlation	1				
	Sig. (2-tailed)					
Prepayment Mechanism	Pearson Correlation	.167*	1			
	Sig. (2-tailed)	0.049				
Age	Pearson Correlation	0.032	0.005	1		
	Sig. (2-tailed)	0.717	0.953			
Previous deliveries	Pearson Correlation	-0.021	0.106	.423**	1	
	Sig. (2-tailed)	0.81	0.216	0.000		
Medical Personnel	Pearson Correlation	-.341**	-0.11	-0.17	-0.039	1
	Sig. (2-tailed)	0.000	0.196	0.051	0.648	
	N	139	139	133	139	139

* Correlation is significant at the 0.05 level (2 tailed).

** Correlation is significant at the 0.01 level (2-tailed).

The findings in Table 4.13 indicate that prepayment mechanism (r =.167*, P = .049), had a positive and significant correlation with mode of child delivery. The significance was supported by a P value of 0.049, which was less than the conventional P value of 0.05. The findings imply that increase in prepayment mechanisms is statistically and significantly correlated with mode of child delivery. This implies that with more options for payment, women are more likely to prefer C-section compared to normal delivery.

The results also indicate that medical personnel (r = -0.341*, P = .000), had a negative and significant correlation with mode of child delivery. The P value shows that relationship between the independent and dependent variable is strong. The findings imply that increase in change in medical personnel is statistically and significantly correlated with mode of child delivery. This implies that women who prefer private personal doctor are more likely to undergo C-section. On the other hand, women who prefer hospital doctor are more likely to undergo normal delivery.

The findings further reveal that age and previous deliveries (P = .717, 0.81) had insignificant correlation with mode of child delivery. The findings imply that increase in age and previous deliveries are statistically and insignificantly correlated with mode of child delivery.

In conclusion, two independent variables present significant correlation while others do not. Prepayment mechanisms and medical personnel present significance correlation while age, previous delivery do not. As such, we have opted to apply the regression analysis on these two variables.

4.6 Multiple Regression Analysis

The main aim of this study was to examine the correlation between prepayment mechanisms and the mode of child delivery in Nairobi County. Having separately established the existence of a significant relationship between prepayment mechanisms, medical personnel and mode of child delivery, it was essential to establish how a combination of the two variables jointly influences the mode of child delivery. A multiple linear regression analysis was therefore carried out to test the relationship between variables. The independent variables (prepayment mechanisms, medical personnel) were regressed on the dependent variable (mode of child delivery). Tables 4.14, 4.15 and 4.16 provide model summary, ANOVA and coefficient results, respectively.

Table 4.14: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.365a	0.133	0.121	0.465

a Predictors: (Constant), Medical Personnel, Prepayment Mechanism

Results in Table 4.14 indicate that all the two predictor variables jointly explain 13.3% (R^2= .133) of the total variations in mode of child delivery. This implies that a change in mode of child delivery is determined by prepayment mechanisms and medical personnel.

Table 4.15: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.526	2	2.263	10.457	.000b
	Residual	29.431	136	0.216		
	Total	33.957	138			

a Dependent Variable: 4. Mode of child delivery for my last child delivery

b Predictors: (Constant), Medical Personnel, Prepayment mechanism

The regression ANOVA model in Table 4.15 reveals an F statistic of 10.457 and reported P value of 0.000. The *P* value being less than the alpha value ($P < .05$), the proposed model is therefore statistically significant (good fit) in predicting the dependent variable.

Table 4.16: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.806	0.145		12.453	0.000
	Prepayment Mechanism	0.114	0.07	0.131	1.635	0.104
	Medical personnel	-0.242	0.06	-0.326	-4.064	0.000

a Dependent Variable: Mode of child delivery

The coefficient results in Table 4.16 reveal that medical personnel (β = -0.242, P = .000) is significant and negatively related to mode of child delivery. However, the relationship between prepayment mechanisms (P>0.000, 0.104) and mode of child delivery is not statistically significant.

The hypothesized model (Md = f (Ag, Pm, Pd, Do.....) is estimated as follows:

Md = 1.806-0.242Do

Where:
Md is the mode of delivery,

Do is the hospital/private doctor.

The model implied that the mode of child delivery could be explained by the type of medical personnel, whether public or private. The findings imply that medical personnel contribute significantly towards the choice of mode of child delivery. This implies that women who prefer private personal doctor are more likely to undergo C-section. On the other hand, women who prefer hospital doctor are more likely to undergo normal delivery.

4.7 Secondary Data Analysis

This section presents findings based on secondary data obtained from three healthcare facilities of different levels in terms of infrastructure, capacity, capabilities and clientele in terms of income groups. The data is obtained from their HRMIS systems.

Table 4.17: Normal vs C-S Deliveries

	Count		Percent	
Mode	**2017**	**2018**	**2017**	**2018**
Normal	1317	1560	53.4%	52.7%
C-section	1151	1398	46.6%	47.3%
	2468	**2958**	**100%**	**100%**

The findings in Table 4.17 reveal that most deliveries were normal deliveries however the C-Section rates were fairly high in percentage.

Table 4.18: Number of Cash and Insurance Clients

	Counts		Percentage	
Payer Type	**2017**	**2018**	**2017**	**2018**
Cash	692	872	28%	29.5%
Insurance	1776	2086	72%	70.5%
Total	**2468**	**2958**	**100%**	**100%**

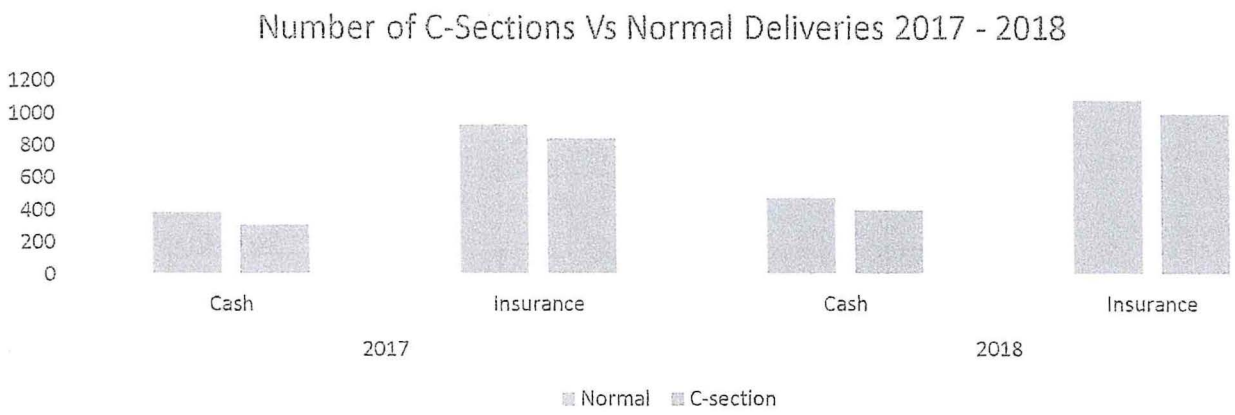
The results in 4.18 indicate that most women who used these facilities had insurance as the mode of payment.

Table 4.19: Deliveries for Cash & Insurance based clients

	2017					2018				
	Normal	**Percentage**	**C-section**	**Percentage**	**Total**	**Normal**	**Percentage**	**C-section**	**Percentage**	**Total**
Cash	385	56%	307	44%	**692**	474	54%	398	46%	**872**
Insurance	932	52%	844	48%	**1,776**	1086	52%	1000	48%	**2,086**

The results in 4.19 indicate that there are more insurance customers than there are cash paying customers accessing care at the healthcare facilities sampled. Of the cash payers, the percentage of normal deliveries is higher than the C-section delivery customers. The same also applies to the insurance customers. However, based on the studies in the literature review, this C-section rate is very high and does not vary significantly from the normal delivery rate. This presents a concern in the healthcare fraternity.

Figure 4.5: A graph of deliveries for Cash & Insurance based clients



The results in Figure 4.5 show that more women went through normal deliveries compared to C-section whether they paid through cash or insurance. However, the difference between the two modes of delivery is fairly small in most cases.

Table 4.20: Deliveries for different Hospital Tiers

Delivery type	Tier1	Percentage	Tier2	Percentage	Tier3	Percentage
Normal	1084	54%	1153	48%	640	65%
C section	934	46%	1269	52%	346	35%
Total	**2018**	**100%**	**2422**	**100%**	**986**	**100%**

The findings in Table 4.20 indicate that the highest percentage of normal deliveries took place in tier3 hospital (65%) during the period 2017-2018. Results also reveal that the highest percentage of C-section deliveries took place in tier2 hospital (52%) during the period 2017-2018.

Table 4.21: Mode of payment for different Hospital Tiers

Billing type	Tier1	Percentage	Tier2	Percentage	Tier3	Percentage
Cash	436	22%	985	41%	143	15%
Insurance	1582	78%	1437	59%	843	85%
Total	**2018**	**100%**	**2422**	**100%**	**986**	**100%**

The findings in Table 4.21 indicate that most clients in all three hospitals paid through insurance. Tier 2 hospital however had a higher proportion of cash payers (41%) compared to the other two during the period 2017-2018.

Table 4.22: Chi Square test; Relationship between Mode of payment and Delivery Mode

		Delivery type					
		Normal	Percentage	C-section	Percentage	Total	Chi-Square (P-value)
Billing Type	Cash	859	55%	705	45%	1564	
	Insurance	2018	52%	1844	48%	3862	
	Total	**2877**	**53%**	**2549**	**47%**	**5426**	**3.187, P =0.074**

The results in Table 4.22 reveal that clients who used cash and insurance as a prepayment mechanism had a higher proportion of normal delivery. The results also indicate that there is significant association between prepayment mechanism and delivery mode. This is supported by (Chi square =3.187, p value=0.074<0.1) at 10% significance level. This implies that while clients who pay through cash and insurance are more likely to go through normal delivery, for both cases, the proportion of C-section remains materially higher as the two modes of delivery are approaching parity at 53% and 47% and more in the scenario of insurance than cash. The literature review supports that rates above 10% at population level cannot be associated with reductions in maternal and newborn mortality rates and that further the international healthcare community is wary of rates exceeding 10 – 15%.

Table 4.23: Independent T-Test; Billing type against Bill amount (Tier1)

	Billing Type	N	Mean	Std. Deviation	F Statistic	P value
Bill amount	Cash	436	124278	74787.1	49.269	0.000
	Insurance	1582	210447	123224		

The findings in Table 4.23 reveal that there is a significant mean difference between the bill amount and billing type in tier 1 hospitals. This is shown by P value of 0.000< 0.05, at 5% significance level. This implies that the amount paid through insurance is significantly higher than the amount paid through cash. In terms of financial implications, the findings imply that clients who pay through insurance also are likely to pay more compared to those who pay using cash.

Table 4.24: Independent T-Test; Billing type against Bill amount (Tier2)

	Billing Type	N	Mean	Std. Deviation	F Statistic	P value
Bill amount	Cash	985	119115	8876	20.094	0.000
	Insurance	1437	153760	91312		

The findings in Table 4.24 reveal that there is a significant mean difference between the bill amount and billing type in tier 2 hospitals. This is shown by P value of 0.000< 0.05, at 5% significance level. This implies that the amount paid through insurance is

The findings in Table 4.27 reveal that there is a significant mean difference between the bill amount and delivery type in tier 2 hospitals. This is shown by a P value 0.000, which is less than the conventional p value of 0.05. This implies that clients who go through C-section pay significantly higher than those who go through normal delivery.

Table 4.28: Independent T-Test; Delivery type against Bill amount (Tier3)

	Delivery type	N	Mean	Std. Deviation	F Statistic	P value
Bill amount	Normal	640	58561	22340	18.403	0.000
	C-section	346	125565	31563		

The findings in Table 4.28 reveal that there is a significant mean difference between the bill amount and delivery type in tier 3 hospitals. This is shown by a P value 0.000, which is less than the conventional p value of 0.05. This implies that clients who go through C-S pay significantly higher than those who go through normal delivery.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, conclusions and recommendations. This is done in line with the objectives of the study. It also provides suggestions for further studies. This study aimed to examine the factors that influence the mode of child delivery in Nairobi County.

5.2 Summary

The first study objective was to determine the relationship between the factors influencing the mode of child delivery in Nairobi County. This was with a key focus on the prepayment mechanisms. The correlation analysis results indicated that there is a significantly positive association between prepayment mechanisms and the mode of child delivery. This was supported by a correlation value of 0.167 and a P-value of 0.049. Furthermore, the regression results revealed that prepayment mechanisms had a positive though insignificant influence on mode of child delivery (P>0.000, 0.104). The findings of the primary data were derived from a sample of 130 members who had accurately completed their data accurately.

A review of the secondary data based on data of 2,468 and 2,958 women in 2017 and 2018 respectively, indicates that more women with a prepayment mechanism underwent C-section deliveries in both years 2017 and 2018 compared to the cash payers according to table 4.19. Similarly, more women who were cash payers delivered through normal delivery in both years 2017 and 2018. The independent tests across the various tiers of hospitals (Table 4.23 and 4.24) indicate that the women with prepayment mechanisms pay more for delivery expenses. Further, those who deliver via C-section also pay more than those who have normal deliveries (Table 4.26 – 4.28). The study cannot also lose sight of the fact that overall, the ratio of C-section deliveries at 47.3% competes strongly with the normal delivery rate of 52.7% (Table 4.17). This rate of C-section raises concern as it

should not be at this level competing with normal delivery. The literature review supports this issue with grave concern.

The first objective on the factors influencing the mode of child delivery also presents another factor that throughout the study is greatly pronounced, that is the medical personnel. The correlation analysis demonstrated statistical significance (r=-0.341*, P= .000). The coefficient results also reveal that medical personnel (β= -0.242, P = .000) is significant and negatively related to the mode of child delivery.

The second study objective was to identify the characteristics of women who opt for normal delivery and those that opt for C-sections in Nairobi County. Results revealed that majority of the respondents who went through normal child delivery were aged 37 years while the ones who went through C-section child delivery were aged 36 years. Results also indicated that 84% of the women who went through C-section child delivery were married and 83% of the respondents who went through normal child delivery were also married. In terms of education, the findings revealed that 50.8% of the respondents who went through normal child delivery were postgraduates, 35.6% were undergraduates, while 13.6% were diploma holders. On the other hand, 47.5% of the respondents who went through C-section child delivery were postgraduates, 38.8% were undergraduates, while 13.8% were diploma holders. Additionally, the finding revealed that 34% of the respondents who went through normal child delivery had two children, while 42% of the respondents who went through C-section child delivery had two children.

The third study objective was to establish the financial implication of decisions made outside medical considerations on prepayment mechanisms. The independent T test results indicated that there is a significant mean difference between the amount paid through cash and insurance. This was supported by a P value 0.000 implying that delivering mothers who opt for prepayment mechanisms such as NHIF, corporate insurance or private insurance are likely to pay more compared to those who opt for cash payment. Further, given that there were more C-section deliveries for women with prepayment mechanisms than those with cash payments, the overall costs to prepayment mechanisms were higher than to cash payments.

5.3 Conclusions

The study concluded that prepayment mechanisms have a statistically significant and positive relationship with mode of child delivery. However, when combined with other variables, prepayment mechanisms did not have a significant predictive ability to influence the mode of child delivery. While the correlation analysis of the primary data indicated no statistical significant of prepayment mechanisms in the correlation analysis, the secondary data that was a much bigger data set presented that C-section rates were higher for women with pre-payment mechanisms. The study also presented medical personnel as another key factor influencing the mode of child delivery. The study found that women who delivered with private medical doctors had higher rates of C-section rates (70%) than the hospital doctor counterparts (54%). The questionnaire also pointed to most women advising that the medical guidance of the medical personnel was a key determinant on the mode of child delivery.

The study also concluded that there was no difference between women who opted for normal delivery and those that opt for C-sections in terms of age. Further, the study concluded that many women who went through both normal and C-section mode of child delivery had previously given birth twice. In addition, the study concluded that in terms of financial implications, women who opted for prepayment mechanisms such as NHIF, corporate insurance or private insurance were likely to pay more compared to those who opted for cash payment.

Concerning the theoretical foundations, the study concludes that there may be an element of supplier induced demand at play. The respondents in the primary data pointed to the decision of the doctor as key informing decisions in the mode of child delivery. Supplier induced demand also points to imperfect information in an imperfect market where patients hand over their decision of care to the medical officers. The C-section patients advised that medical emergency was the leading cause of the reason for their C-section delivery however at the rate of 57.6% of respondents having had a C-section delivery, this study points to such high C-section rates failing to demonstrate and deliver reduction in maternal and newborn mortality rates.

The study further concludes that moral hazard contributed to the outcomes of the study being that prepayment mechanism correlates with the mode of child delivery where the presence of a prepayment scheme would have contributed to change of behavior leading to increase of certain services. From the primary data findings, private hospitals had a higher proportion of C-section deliveries (59%) compared to normal delivery (41%). Studies have shown that C-section seems to be profit centers due to the increased revenue that comes with them. Private personal doctors also had more C-Section deliveries (70%) compared to hospital doctors (54%). The study showed that on average C-section costs were higher which could potentially translate to higher revenues for the doctor. We cannot also rule patient moral hazard in influencing the decisions of the mode of delivery. The primary data also demonstrated that personal preference also contributed to probably some decisions on higher C-section rates. Studies have shown that convenient scheduling of births, concerns of pelvic floor preservations and beliefs that C-section is "safer" for the baby amongst other factors contribute to the moral hazard in the increased C-section rates.

5.4 Recommendations

From the foregoing conclusions, the study established that prepayment mechanisms and medical personnel had a statistically significant relationship with the mode of child delivery in Nairobi County.

The rate of C-section across the primary and secondary data points to a worrying trend of high C-section deliveries that is known to pose health risks to mothers and children. Education is paramount to helping women appreciate the risks of C-sections. This education should be facilitated by the prepayment mechanism as well as the healthcare facilities. The prepayment mechanisms should hold the healthcare service providers and medical personnel accountable through formulating clear guidelines and policies that inform the decisions for C-section deliveries with clear clinical indications. The prepayment mechanisms also need to consider strategic purchasing models that seek to reduce the wide price variations of normal delivery and C-section deliveries which encourage moral hazards for higher compensation. The fee for service model applied in Kenya should be reviewed also as it encourages the passing of all costs to the payer

regardless of the inefficiency of the production of services thus the providers have no drive for efficiency.

The prepayment mechanisms should also provide education to the healthcare facilities and doctors on the implications of unnecessary services on the management of healthcare services, the cost of healthcare and the challenges it presents of increasing costs to the buyers of these prepayment mechanism solutions making the overall model inaccessible and unaffordable. This also translates to the lower achievement of the universal health coverage goals at a national level. This education must also demand accountability with clear acceptable levels of C-section deliveries being defined and monitored. Deterrence's should also be instituted with clear implications on wayward trends communicated and effected.

The government should also weigh in on this matter through the lobbying of the prepayment mechanisms to help guide on reasonable procedure costs and doctors' fees through the Ministry of Health. In addition, they can demand the enforcement of some of the guidelines provided by the international health organizations including developing local guidelines as well. The government should also enhance the infrastructure of various facilities and increase training of medical personnel in obstetrician and gynaecology services to reduce dependence on a few facilities and help reduce costs due to increased supply.

In conclusion, the study also sought to invite recommendations from the respondents in the primary data collected. Some of the responses included making maternal health affordable, according proper training to the women on maternal healthcare, investment in more infrastructure in more facilities to reduced strain and dependence on few facilities, transparency to the women on the risks of the various modes of delivery including providing a lot of counselling and information on the delivery options. Other women felt that insurance policies should increase the maternity benefits and limits and others felt they should be allowed to choose their preferred mode of delivery as long as it is not an emergency.

All stakeholders will need to work together to ensure the best interest of the maternal health sector are upheld with the best practices.

5.5 Suggestions for Further Studies

Other recommended future studies would be on the high rates of C-section which are deemed as medical emergencies by the medical fraternity. The findings imply that a high population of women suffer complications at birth and thus end up delivering via C-section. This would need to be studied further to ascertain this position.

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APPENDICES

Appendix I: Questionnaire of women's maternal health choices

Questionnaire on Women's maternal health choices

Women have several health choices during their lifetime. One of the decisions a woman may have to make relates to matters of childbirth. A woman may choose to have one or more children and several factors may influence the health decisions she makes during the pregnancy term. This survey seeks to understand the women who have had children and the health choices they made on the mode of child delivery.

You are invited to participate in this study, 'An examination of the correlation between prepayment mechanisms and the mode of child delivery - a case study of Nairobi County.' I am conducting this research because of my interest in this area, and as part of my Masters in Healthcare Management research thesis requirement for graduation from Strathmore University Business School. I am examining what non-medical reasons contribute to the mode of child delivery, for example, normal/vaginal delivery or caesarean (c-section) section delivery.

Your most candid input will be greatly appreciated. Please fill out this questionnaire and submit it back to us. Thank you.

* Required

Skip to question 1Skip to question 1

Confidentiality Statement

1. Voluntary Consent *

Please tick each of these boxes below to confirm your consent to participate in this research.

Check all that apply.

- I understand that I am participating in this research voluntarily and
- I understand that I am free to withdraw from the study at any time
- I understand that any information regarding my identity obtained in connection with this research will remain confidential
- I will not write my name or otherwise indicate my identity on any part of this research
- By giving my consent through ticking each of these boxes, I agree that I understand the research objective as summarized above in section 1.

Skip to question 2

Demographic

This section seeks to collect information about the research participant. This information will remain confidential.

2. 1. Year of Birth *

3. 2. Marital Status *

Mark only one oval.

- Single
- Married
- Widowed

4. 3. Level of education *

Mark only one oval.

- Secondary level
- Diploma level
- Under graduate level
- Post graduate level
- Others (PHD)

5. 4. Occupation *

Mark only one oval.

Healthcare and Medicine sector (Medical profession and related)

FInance sector (Banking, insurance, accounting and related)

Legal sector (Lawyers, judiciary and related)

Industry and Manufacturing sector (Engineering, production, quality control and related)

Science and Technology (Computer science, engineering, mathematician, geographers and related)

Education sector (Professors, teachers and related)

Business sector (Entrepreneurship, marketing, sales, process management, project management and related)

Arts and Entertainment (Film, television, theatre, writing and related)

Other Sector (Please specify)

6. Please specify the "Other sector" occupation

7. Income level *

Mark only one oval.

Below Kes. 25,000

Kes. 25,000 - 49,999

Kes. 50,000 - 99,999

Kes. 100,000 - 199,999

Kes. 200,000 - 299,999

Kes. 300,000 - 399,999

Kes. 400,000 - 499,999

Kes. 500,000 - 599,999

Kes. 600,000 - 699,999

Kes. 700,000 and above

8. 6. Number of children *

Mark only one oval.

- 1
- 2
- 3
- 4
- 5 and above

Skip to question 9

Maternal Information

This section seeks to obtain information about the mode of child delivery, mode of payment and the healthcare facilities in which services were sought.

9. 1. Mode of payment for the medical bills of my last child delivery (You can tick more than one box) *

Check all that apply

- [ ] I paid the bills myself (cash/ out of pocket/loan/ contributions from friends or family)
- [ ] I paid through my/my spouse employer's insurance or my/my spouse employer's fund
- [ ] I paid through my/my spouse private insurance purchased by myself/my spouse
- [ ] I had NHIF pay my bills through my/my spouse employer scheme
- [ ] I had NHIF pay my bills through my/my spouse voluntary contribution
- [ ] I had NHIF pay my bills through the Linda Mama Scheme

10. 2. Hospital where your last child was delivered *

Mark only one oval.

- Government facility
- Private Hospital
- Faith based/Mission Hospital

11. 3. County where you delivered your last child? *

Mark only one oval.

- Nairobi
- Kiambu
- Nakuru
- Kakamega
- Bungoma
- Meru
- Kilifi
- Machakos
- Kisii
- Mombasa
- Uasin Gishu
- Narok
- Kisumu
- Kitui
- Homa Bay
- Kajiado
- Migori
- Murang'a
- Siaya
- Trans-Nzoia
- Makueni
- Turkana
- Kericho
- Busia
- Nandi
- Bomet
- Mandera
- Kwale
- Garissa

Wajir

Nyeri

Baringo

Nyandarua

West Pokot

Kirinyaga

Embu

Nyamira

Vihiga

Laikipia

Marsabit

Elgeyo-Marakwet

Tharaka-Nithi

Taita–Taveta

Tana River

Samburu

Isiolo

Lamu

12. 3. Medical personnel who delivered your last child (You can tick more than one box) *

Check all that apply.

- Private personal doctor
- Hospital doctor
- Midwife

13. 4. Mode of child delivery for my last child delivery *

Mark only one oval.

- Normal/ Vaginal delivery
- Caesarean section delivery

14. 5. What informed the decision to have a normal/vaginal delivery? (Complete this only if you had a normal/vaginal delivery. You can tick more than one box)

Check all that apply.

- [ ] Medical doctor recommendation
- [ ] Previous child delivery (normal delivery) led to me making the same decision
- [ ] Previous child delivery (C-section) led to me changing the decision
- [ ] Personal choice. Please specify below what informed this personal decision

15. Please specify what informed the personal decision

16. 6. What informed the decision to have a Caesarean section delivery? (Complete this only if you had a C-section delivery. You can tick more than one box)

Check all that apply.

- [ ] Medical emergency (labor was not progressing, baby was in distress, other health concerns, medical obstruction, cord trapped against baby's body)
- [ ] Medical doctor recommendation
- [ ] Personal request to have this choice of delivery for personal reasons
- [ ] Fear of pain in normal/vaginal delivery
- [ ] Wanted to have convenient scheduling of child birth
- [ ] Wanted to preserve my pelvic floor
- [ ] Previous scar from previous C-section delivery led me making the same decision
- [ ] Previous delivery - normal delivery led to me changing the decision
- [ ] Other reason

17. Other reason in addition to the above options. Please specify this reason

18. 7. What would you say were the key informing decisions on the mode of child delivery? (You can tick more than one box) *

Check all that apply.

- [ ] Decision of the doctor
- [ ] My preferred mode of delivery prevailed over the doctor's decision
- [ ] My/my spouse financial capability to finance the mode of child delivery
- [ ] My/my spouse personal insurance ability to cover the costs
- [ ] My/my spouse employer insurance ability to cover the costs
- [ ] My/my spouse National Hospital Insurance Fund (NHIF) ability to cover the costs
- [ ] Other reason. Please specify this reason below.

19. Other reason in addition to the above options. Please specify this reason

20. 8. Education and awareness – were you provided with information on the various modes of delivery and the risks of each process whether normal/vaginal or C-section? *

Mark only one oval.

- Yes
- No
- Maybe/Not sure/Can't remember

21. 9. What would you recommend the healthcare sector improves on regarding maternal health decisions of child delivery? *

Appendix II: Letter of Introduction

Strathmore
UNIVERSITY
BUSINESS SCHOOL

Monday, 30 September 2019

To whom it may concern,

RE: INTRODUCTION - CATHERINE KARORI BOSIRE

This is to introduce **Mrs. Catherine Bosire**, admission number **MBA HCM/89923/2018** who is an MBA in Healthcare Management (MBA HCM) student at Strathmore University Business School (SBS). As part of our SBS MBA HCM Master's Program, Catherine is expected to do applied research and to undertake a project. This is in partial fulfilment of the requirements of the Master of Business Administration. She would like to request for appropriate data from your organization to help her finalize her research.

Catherine is undertaking a research project on **'An Examination of the Correlation Between Pre-Payment Mechanisms and the Mode of Maternity Delivery in Kenya.** The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

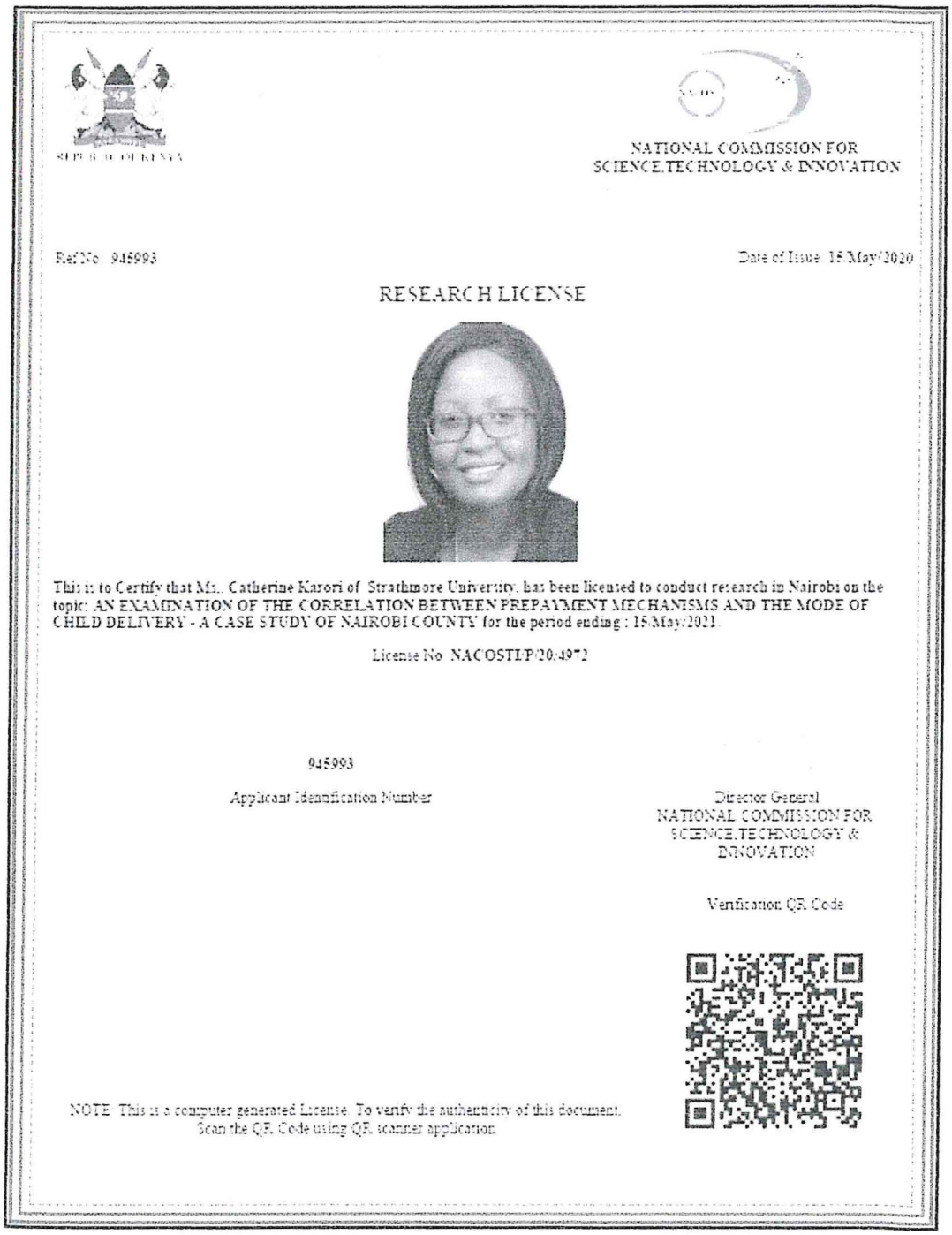
Our MBA seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct usefulness to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest, if not of practical value to your organization.

Any assistance you can provide to her will be greatly appreciated and we shall be willing to provide any further information required.

Yours Faithfully,

Veronica Muniu,
Manager – Programs.

Appendix III: Research Permit



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Date of Issue: 15/May/2020

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This is to Certify that Ms.. Catherine Karori of Strathmore University, has been licensed to conduct research in Nairobi on the topic: AN EXAMINATION OF THE CORRELATION BETWEEN PREPAYMENT MECHANISMS AND THE MODE OF CHILD DELIVERY - A CASE STUDY OF NAIROBI COUNTY for the period ending : 15/May/2021.

License No: NACOSTI/P/20/4972

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Appendix IV: Timeline of Activities

TIME	ACTIVITIES
January	Writing the project proposal
February	Correcting and binding the project proposal
March - May	Presenting and defending the proposal Dissertation Correction After Assessment by Examiners
June-November 2020	Data collection & analysis Completion of the project and presentation
November 2020- April 2021	Submit thesis for Examination. Thesis Examination Thesis Oral defense Correction of thesis