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Women's preferences for place of delivery: a study of Embakasi-North and Naivasha Sub-County's, Kenya.

Aridi, Jackline A. Oluoch
Strathmore University Business School
Strathmore University

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Jackline Akinyi Oluoch Aridi

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Women's Preferences for Place of Delivery: A Study of Embakasi-North and Naivasha Sub-County, Kenya

Jackline Akinyi Oluoch Aridi

Submitted in total fulfilment of the requirements for the Degree of Doctor of Philosophy in Health System Management at Strathmore University

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Strathmore University

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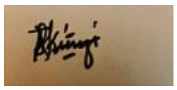
DECLARATION

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

Jackline Akinyi Oluoch Aridi



Signature: -------------------- Date: 4th December 2020

Approval: The thesis of Jackline Akinyi Oluoch Aridi was reviewed and approved by the following:

Prof. Gilbert K'okwaro Ph.D.
Institute of Healthcare Management
Strathmore University

Dr. Francis Wafula Ph.D.
Institute of Healthcare Management
Strathmore University

Dr. Mary B. Adam, Ph.D.
Institute of Healthcare Management
Strathmore University

Dr. George Njenga
Executive Dean,
Strathmore University Business School
Strathmore University

Dr. Bernard Shibwabo, Ph.D.
Director, Office of Graduate Studies
Strathmore University

PREFACE

My interest in maternal health began with my first assignment after graduate school, managing community health worker programs in eight countries in East and Southern Africa. During this job, I was able to see the hard work it takes at the community level to maintain women and children's health. This led me to have a keener interest in the most critical time during a woman's lifetime-during delivery. Studying facility-based delivery has enabled me to have a deeper understanding of the complex contextual issue it is. It takes a community, for a woman to have a safe delivery. I hope this study focused on women's preferences will shed light on the community, healthcare workers and policymakers to always give women a voice during this critical time in life.

ABSTRACT

High maternal mortality continues to affect many sub-Saharan African countries. Kenya continues to have an unacceptable high maternal mortality ratio. Despite a rise in coverage for facility-based delivery following a free maternity services policy in 2013, there is little data on what women value when making their decision in choosing a place of delivery. There is uncertainty regarding factors that influence women's choice of health facilities and women's perceptions of quality of care. This study sought to examine women's preferences and to rank attributes of the health system that drive women's choices. The study compared the preferences of women in Embakasi North a peri-urban setting in Nairobi County with those in a rural Naivasha sub-County. It utilized a mixed methods study incorporating a qualitative study and a quantitative study approach; a Discrete Choice Experiment (DCE) for evaluating the factors that women value when selecting their place of delivery. In Naivasha, women ranked the highest attribute preference as the presence of a kind and supportive attitude of healthcare worker (β=1.184, $p<0.001$), whereas in Embakasi-North sub- County the women's highest preference was for the attribute on cleanliness of the health facility, (β=1.488, $p<0.001$).This was followed by availability of medical equipment and drugs in both the Naivasha (β=1.073, $p<0.001$), and Embakasi-North (β=1.435, $p<0.001$). The attribute ranked third for Naivasha was the quality of clinical services during delivery (β=0.826, $p<0.001$) whereas in Embakasi-North it was the alternative specific constant (β=1.424, $p<0.001$). The coefficient for both the distance to the health facility and cost of delivery for Naivasha (β=0.457$p<0.001$) and (β=0.00002, $p<0.001$) respectively and Embakasi-North (β=0.339, $p<0.001$) and (β= $p<0.0002$) were positive and statistically significant at the 1 % level. These results indicate a preference for high costs and long distance which contradict economic theory that predicts that most rationale people would have a preference for low costs and short distances respectively. This implies that women were bypassing closer health facilities and seeking care at further off health facilities. The cost result implies that women were willing to pay higher costs for services that they perceive would be of higher quality. The study established that sociodemographic such as age, marital status, income status and education level all influence the ranking of attributes with the exception of cost and distance in Embakasi-North. These findings suggest that women value both structural and process indicators of quality of care. Patient-centered aspects of care matters to women. By paying attention to their preferences, policy makers can provide care that women want and value. To prevent bypass of closer health facilities and promote affordable care, policy makers should provide care that has the requisite medical equipment and respectful healthcare workers that are responsive to women's needs. This will assist in meeting the Sustainable Development Goals (SDGs) targets for reducing preventable maternal mortality.

Keywords: Women preferences place of delivery Kenya Discrete Choice Experiment

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ANC	Antenatal Care
CHW	Community Health Worker
DCE	Discrete Choice Experiment
EMOC	Emergency Obstetric Care
FBD	Facility-Based Delivery
FGD	Focus Group Discussion
GOK	Government of Kenya
IDI	In-Depth Interview
MOH	Ministry of Health
MMR	Maternal Mortality Ratio
MDG	Millennium Development Goals
NACOSTI	National Commission for Science Technology and Innovation
NHIF	National Health Insurance Fund
ODK	Open Data Kit
OOP	Out-of-Pocket
SDG	Sustainable Development Goals
SBA	Skilled Birth Attendance
UHC	Universal Health Coverage
UNFPA	United Nations Population Fund
WHO	World Health Organization

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I wish to acknowledge the support of my main supervisor Prof. Gilbert K'okwaro. I want to thank him for believing in me and taking me on as his student and having faith in my abilities to conduct quality research. Thank you for being a teacher to me and about introducing me to the world of universal health coverage.

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To my colleagues at Strathmore. Dr. Ben Ngoye for graciously spending time with us during the Ph.D. seminars where I struggled with theories. To my other Ph.D. colleagues Mary, Eric Tama, for providing critical feedback to my work. To Sylvia for your support at SBS.

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Lastly, to Fred, Maya, and Bree, thank you for accepting my absences at home to do this important work, I am eternally grateful for your love and support.

DEDICATION

To my parents Rose and Edward Oluoch for guiding me and inspiring me to embrace education to the highest levels possible. And to my daughters Maya and Bree for allowing me to pursue my dreams.

THESIS CHAPTERS OVERVIEW

The thesis is divided into six chapters:

Chapter 1: Introduction

This chapter sets forth a context and the reasoning behind the analysis. It gives information about the research goals and the research questions. It also explains the research methodology and the study's importance to policy.

Chapter 2: Literature Review

This chapter provides a review of the empirical and qualitative literature. It also provides the conceptual and theoretical frameworks that have been used to explore the research questions.

Chapter 3: Research Methodology

This chapter describes the research methodologies that were used to conduct the research. This includes, participant recruitment, data collection, data management, data analysis and estimation and the application of ethics to the research.

Chapter 4: Presentation of Research Results

This chapter presents the research findings of a qualitative study and the results of the quantitative study organized to respond to the research objectives.

Chapter 5: Discussion

This chapter explores the underlying meaning of the research results and the implications to other research areas and other areas of possible research. It also provides the strengths and limitations of the research study.

Chapter 6: Conclusions and Recommendations

This chapter provides the conclusion from the results and provides recommendations targeted at academia and practitioners for further research. It also elaborates the contribution of the research to the wider body of knowledge.

CHAPTER ONE

INTRODUCTION

1.1 Maternal Mortality as a Global and National Health Issue

Globally an estimated 295,000 women reportedly died of maternity-related causes in 2017. A significant number of the deaths (99%) occur in developing countries, with more than half (66%) occurring in sub-Saharan Africa (Alkema et al., 2016; WHO, 2019). The estimated lifetime risk of maternal mortality in low-income countries is 1 in 37, compared to 1 in 7800 for high-income countries (WHO, 2019). Maternal mortality can be expressed in terms of the maternal mortality ratio (MMR) which According to the International Classification of Diseases (ICD)-10 definition has been defined as "the number of female deaths per 100,000 live births from any cause related to or aggravated by the pregnancy or its management (excluding accidental or incidental causes). It includes deaths from pregnancy, childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy for a specific year" (WHO, 1999).

The Maternal mortality ratio (MMR) is a key indicator of both a country's overall development and the health status of its population. MMR is highest in sub-Saharan Africa at 542 maternal deaths for every 100,000 live births (WHO, 2019). Thus, despite tremendous progress in reducing maternal mortality by 38% between 2000 to 2017, few countries in sub-Saharan Africa met the Millennium Development Goal (MDG) 5 which was to 'improve maternal health'. The MDG indicator that measured strategies aimed at reducing maternal mortality ratio was the percentage of births with a skilled birth attendant present during delivery and it had two targets; target 5a: reduce by three quarters, the maternal mortality ratio between 1990 and 2015 and Target 5b: achieve, by 2015, universal access to reproductive health (United Nations, 2015). In the post MDG era, the UN's Sustainable Development Goal (SDG) target 3.1 aims at reducing the global MMR to at least 70 for every 100,000 live births by 2030 (United Nations, 2015). Achieving this SDG target will require reducing the global MMR by an average of 7.5% each year between 2016 and 2030 (United Nations, 2015).

High maternal mortality, therefore, remains a major health system challenge within sub-Saharan Africa and needs to be urgently addressed. It impacts the achievement of both SDG 3 and Universal Health Coverage (UHC) for Kenya, which forms part of Agenda 4 which was launched by the Kenyan president H.E. Uhuru Kenyatta in 2019. Kenya did not achieve the MDG target on maternal mortality, mainly due to a lack of access to life-saving care during delivery and access to skilled birth attendance (Alkema et al., 2016). However, Kenya did have some improvements in reducing maternal mortality between 2003 and 2014, the reported (2014) maternal mortality ratio of 362 per 100,000 live births. (Kenya National Bureau of Statistics Nairobi, 2015). These improvements however were insufficient and the MMR was still above the regional target of 200 and the SDG target of 70 per 100,000 live births (Figure 1.1)

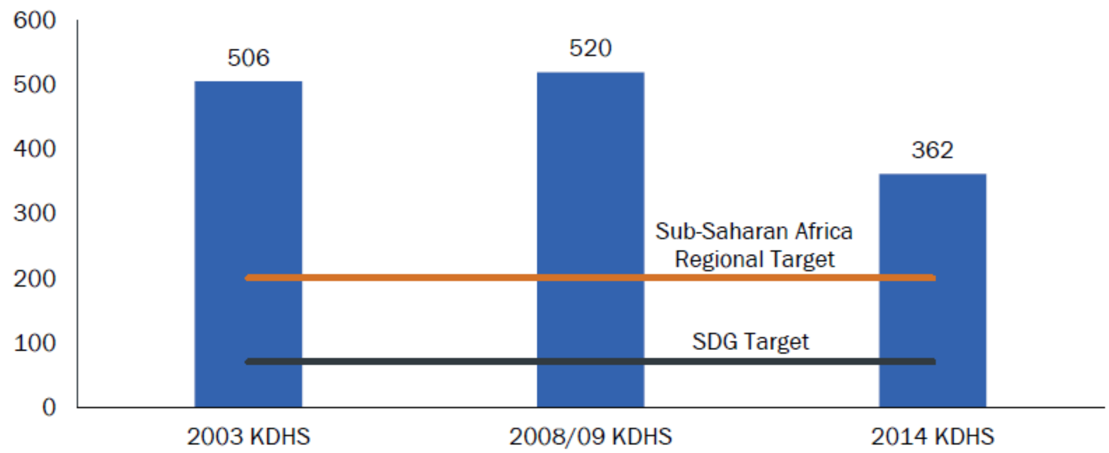

Figure 1.1: Maternal Mortality Ratio for Kenya (Source: KNBS 2009; KNBS 2015)

Moreover, Kenya has also not achieved the target MMR of 150 per 100,000 live births stated in the Fourth Kenya Health Sector Strategic and Investment Plan (KHSSP IV), July 2014-June 2018: 'Transforming Health-Accelerating attainment of Universal Health Coverage' (Ministry of Health, 2018). The lifetime risk of dying prematurely in pregnancy in Kenya is 1 in 42 (Alkema et al., 2016). Kenya will need to do more to address the high maternal mortality if the country is to achieve the SDG 3. Most causes of maternal mortality in sub-Saharan Africa are due to hemorrhage, high blood pressure, and sepsis (Say et al., 2014). These causes are preventable through access to basic facility-based care at primary health facilities and are the main maternal health challenges that Kenya needs to focus on, if it is to make progress towards attaining the SDG 3 targets. They can be dealt with primarily through improving access to life-saving and high-quality facility-based delivery care that addresses the barriers to access to such care (WHO, 1999).

Despite efforts made, maternal mortality is still unacceptably high in Kenya. For example, in 2014 alone, 6,632 women in Kenya died of pregnancy-related deaths (UNFPA, 2014). A UNFPA situation review of the burden of maternal death in Kenya revealed that 15 out of 47 counties accounted for 98.7% of total maternal deaths in Kenya. (UNFPA, 2014). This increase in maternal deaths follows the enactment of a new constitution in Kenya in 2010 which saw the provision of health services was devolved to the 47 counties in 2013.

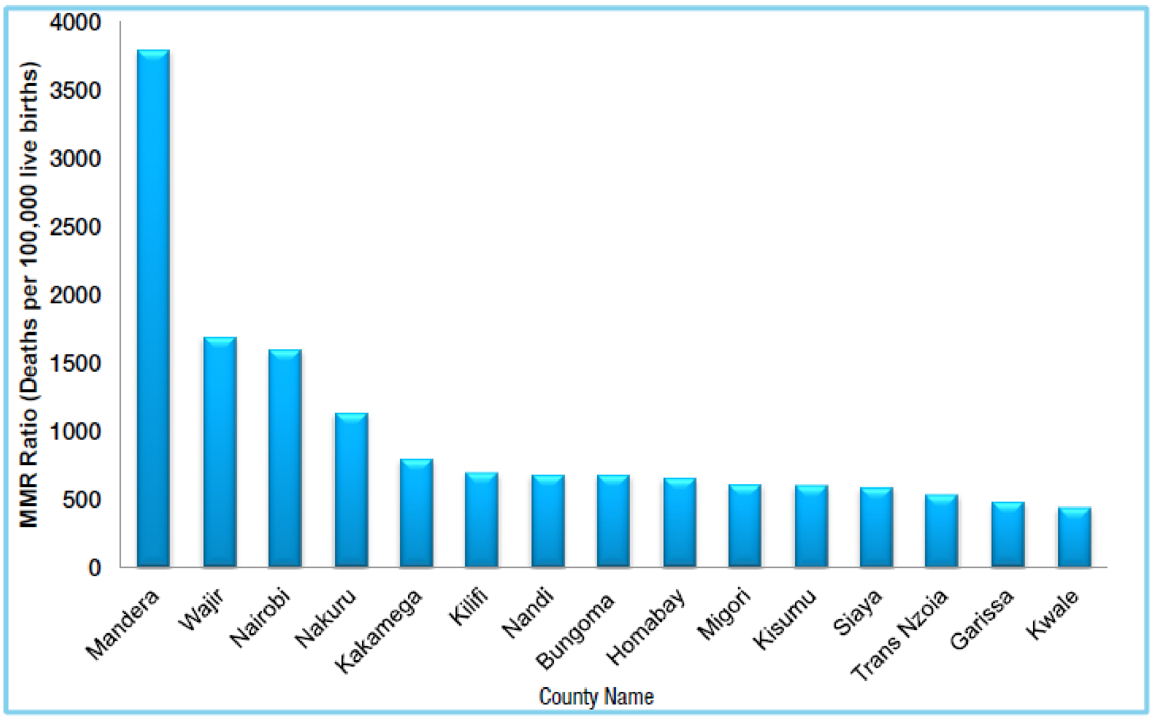

Figure 1.2: Ranking of the counties by Maternal Mortality Ratio for the 15 most burdened counties (Source: (UNFPA, 2014.)

This points to the wide range of disparities in maternal deaths among counties in Kenya. Nairobi County, which is an urban county with the largest concentration of health facilities in Kenya, is ranked number 3 among the 15 counties with the worst MMR (UNFPA, 2014) For Nairobi, there are also huge disparities with informal settlements having markedly higher maternal mortality ratios compared to the more affluent parts of the city. For example, a study in two informal settlements in Nairobi (*Viwandani* and *Korogocho*), estimated maternal mortality at 703 deaths per 100,000 live births, almost twice the national average (Ziraba et al., 2009). Increasing the proportion of mothers delivering at facilities is one way of reducing maternal and infant mortality. However, having health facilities in close access does not always translate into more-facility-based deliveries and subsequent fewer maternal deaths. Nairobi County is a case in point; despite having the largest number of health facilities, including the largest teaching and referral hospital in East and Central Africa, Nairobi has one of the worst MMR's in Kenya. The large disparities in MMR within Kenya point to underlying issues of access to quality health services. Access has several dimensions- physical access, financial access, linguistic access and information access (Ramirez-Rubio et al., 2019). Thus, while rural women struggle with distance to any facility (physical access), urban women have a range of facilities to choose from, but still face other challenges such as financial access that limit their access to quality health services (Naanyu et al., 2020). These barriers to access to quality services may explain why poor Kenyan women have been reported to be receiving lower quality health services (Sharma et al., 2017).

1.2 Factors Limiting Access to Life-Saving Maternal Care

Theoretically, when delivery occurs in a licensed health facility, women have access to life-saving delivery care that assesses the risks and addresses the common causes of maternal mortality, such as hemorrhage, pre-eclampsia (high blood pressure) and sepsis (Say et al., 2014). Strategies for improving maternal health are well studied and established, given that most pregnancy-related complications and deaths occur mostly during labor and childbirth. Evidence indicates that the most important proximate determinant of maternal health and survival is the extent to which women have access to and utilize high-quality maternal health care services (WHO, 2004). In a bid to stem maternal deaths, international recommendations suggest that skilled birth attendance at delivery and timely referrals to Emergency Obstetric Care services (EmOC) can greatly reduce maternal deaths and disabilities (WHO, 2004 ; Filippi et al., 2016). These recommendations call for scaling up critical interventions to accelerate progress towards meeting SDG targets for reducing maternal mortality and improving maternal health.

National evidence suggests that there are several inequities representing barriers to addressing maternal mortality for example, while 92% of Kenyan women can access a health facility for antenatal care, only 61% deliver their babies in a health facility (Kenya National Bureau of Statistics 2015). Moreover, rates of facility-based delivery vary substantially, among mothers with no education, only 25 % deliver in a health facility, as compared with 84% of mothers with secondary or higher education (Kenya National Bureau of Statistics, 2015). Similarly, 30% of mothers in the lowest wealth quintile deliver in a health facility, compared with 93% in the highest quintile (Kenya National Bureau of Statistics, 2015). Lack of transport, distance to facility, the assumption that facility delivery is unnecessary, abrupt delivery and cost are some of the barriers to facility-based delivery. On the other hand, the main predictors of delivery in a health facility have been identified as an urban residence, being wealthy, better education, low parity, ethnicity, and the types of health facility use (Kitui et al., 2013).

Similarly, studies on barriers to facility-based care and recommendations to address these barriers have been made specifically regarding Kenya. Studies assessing factors influencing place of delivery in Kenya have identified factors such as maternal age, maternal education, and marital status (Stephenson et al., 2006); (Magadi et al., 2007); (Gitonga & Muiruri, 2016); (Mwangi et al., 2018); (Karanja et al., 2018). Some studies reported that younger Kenyan women are more likely to deliver in a health facility (Magadi et al., 2000); (Fotso et al., 2009) (Ochako et al., 2011); (Wanjira et al., 2011); (Banke-Thomas et al., 2017). Ethnicity and marital status (Fotso et al., 2009); (Ochako et al., 2011); (Kitui et al., 2013), and other social factors such as husband's education (Bazant & Koenig, 2009); (Moyer & Mustafa, 2013) and a non-male household head and husband's occupation (Kitui et al., 2013). family size, household wealth (Gitonga & Muiruri, 2016); (Karanja et al., 2018), distance to health facilities (Kitui et al., 2013), cost, perceived quality of care, availability of medicine and presence of equipment, presence of health care providers, and staff attitudes and behaviors (Moyer & Mustafa, 2013) have all been shown to affect influence facility-based delivery. These studies point to a complex context in which women's personal characteristics and health system factors influence place of delivery within Kenya.

1.3 Strategies to Increase Access to Quality Life-Saving Maternal Care in Kenya

Maternal mortality in Kenya has fallen over the MDG era from 2000 to 2015, however the reported (2015) maternal mortality ratio of 362 per 100,000 live births is still above the regional target of 200 and the SDG target of 70 per 100,000 live births (Kenya National Bureau of Statistics, 2015). Moreover, Kenya also missed the target of 150 per 100,000 live births as stated in the Fourth Kenya Health Sector Strategic and Investment Plan (KHSSP) 2014-2018 (Ministry of Health, 2018). Challenges in meeting the targets aimed at reducing maternal mortality include vast geographical health disparities across the nation, with poor maternal health indicators reported for certain counties. A recent situational analysis identified 15 counties out of the 47 counties accounted for 98.7 % of the total maternal deaths in Kenya. The fifteen counties include *Mandera*, *Wajir, Turkana, Marsabit, Isiolo, Siaya, Lamu, Migori, Garissa, Nairobi, Nakuru, Kakamega, Homabay, Taita Taveta* and *Kisumu* (UNFPA, 2014). See figure 1.2 in chapter one.

Although the proportion of pregnant women delivering in a health facility has been increasing rapidly in Kenya currently at 61%, there have been concerns around the quality of health services at facilities across Kenya (Kenya National Bureau of Statistics, 2015). Poor women have been reported to receive poorer quality of services at health facilities in Kenya and significant variation in the quality of processes of care in primary health facilities have been described. (Sharma et al., 2017; Kruk et al., 2016). Additionally, the implementation of the new free maternity has also had significant challenges such as delays in reimbursement of health care providers, poor referral health facilities consequently leading to low quality of care (Tama et al., 2018; Langat and Mwanri et al., 2015; Gitobu et al., 2018). In summary, the level and quality of services obtainable from healthcare providers in Kenya were reported as highly variable (Muthaka et al 2004).

To address some of the barriers described above, Kenya implemented a few initiatives on improving the quality of maternal care. For example, the Kenya Reproductive Maternal Newborn Child and adolescent (RMNCAH) health investment framework is the policy document that has singled out access to quality maternal health services as a significant challenge across all levels of care and goes on to identify inequities with respect to geography, population sub-groups, and economic status that are persist due to supply and demand-side barriers (Ministry of Health Kenya, 2016). In response to the challenges identified in the policy document, several policy proposals have been made to increase access to health services including maternity services, as well as improve the quality of health services in Kenya.

Another key document, the Fourth National Health Sector Strategic and Investment Plan (2014-2018) which had set out to reduce MMR to 150 per 100,000 live births by 2018 (Ministry of Health, 2018).Additional policies specifically addressing quality of health services in health facilities have been implemented. Examples include the Kenya Quality model for Health (KQMH) policy modeled based on successes in Asian contexts such as Sri-Lanka and Japan initiated the 5S-Continous Quality Improvement (Kaizen)-Total Quality Management (TQM) stepwise approach (Ministry of Health, 2014). The aim was to improve the quality of care through the establishment of a customer-oriented approach. This identified quality improvement in healthcare as a mechanism for improving adherence to standards and guidelines, improving the structure-process-outcome of health services by applying the principles and tools of quality management and meeting the needs of patients in a culturally acceptable way (Ministry of Health, 2014). However, the implementation of the Kenya Quality Model was not without challenges. It was identified that the implementation was not participatory in nature, and its principles were poorly understood by those who were supposed to implement it. Additionally, several challenges during the implementation were experienced for instance sub-standard health facilities, professional misconduct, non-professionals offering health services and lack of regulation of the pharmaceutical sector (Ministry of Health, 2014).

More recent reports based on evaluations tools such as the Public Expenditure Tracking Survey (PETS) - an expenditure tracking survey tool for assessing flow of resources from source to peripheral sites, assessment of efficiency and leakage of resources including commodities and an aspect of quality of services have provided evidence for the reduced quality of care in terms of service delivery at health facilities (Chen et al., 2014). Furthermore, the study revealed that only 65 percent of health spending reaches end users, suggesting major inefficiency and leakage (Chen et al., 2014). Assessing the quality of primary health services revealed further evidence of the poor quality of care at health facilities in Kenya (Sharma et al., 2017) and highlights important gaps in the quality of care in Kenya, especially with regard to basic infrastructure, medical equipment, and other medical supplies, and diagnostic accuracy and adherence to clinical guidelines by the service providers. These findings call for further research on how to implement quality of care in the health system in Kenya.

Kenya's total health spending was approximately 6 percent of the annual budget which is also low (UNECA, 2019). This puts Kenya's health spending below the heads of state Abuja Declaration proposed average of 15 percent of annual budget (WHO, 2011). Additionally, Kenya's, government expenditures on health as a percentage of total government expenditures has stagnated around 6 percent, putting Kenya further from its goal of increasing health expenditures to 12 percent of total government expenditures as set in the Kenya Health Sector Strategic and Investment Plan (KHSSP) 2014-2018 (Ministry of Health, 2018). However, a significant part of the public expenditure-about one third is covered by household Out-of-Pocket (OOP) expenditures (Acharya et al., 2013).

The Government of Kenya (GoK) in 2013, in an attempt to increase universal health coverage and ease the burden of financing health care to households abolished user fees in the public sector at dispensary and health center level for all users of the public health system (World Bank, 2014). In 2013, the Government of Kenya also initiated a free maternal health program by a presidential decree all public facilities and implemented through the newly devolved county system. The program was aimed at improving access and quality of healthcare to mothers, newborns and children. The implementation of this program however underwent significant fiscal challenges in 2017, subsequently the program was launched as the expanded free maternal care program and dubbed *Linda mama, boresha maisha.* (NHIF, 2016) The Government set aside 4.5 billion in the financial year 2016/17 towards the implementation of the program with an aim of reaching 400,000 underserved women by offering free maternal health care services (Ministry of Health, 2015). The newly launched program is currently under implementation by the National Hospital Insurance Fund (NHIF).

Another significant event was the promulgation of a new constitution in 2010, with new responsibilities devolved to forty-seven new sub-national governments called counties. The counties are responsible for health service delivery whereas the national government focuses on research and policy. The newly devolved County Governments are currently responsible for delivery of health services and account for 40% funding which has increased from 700 million Kenya shillings in the 2012/13 Budget to 1.7 Billion in the Medium Term Expenditure Framework (MTEF) period of 2014/15 to 2016/17 (World Bank, 2014). The newly devolved counties with their new roles in service delivery will be responsible for addressing demand and supply challenges within the health system.

Other strategies include the first lady and the nationwide Beyond Zero campaign that is aimed at ensuring no woman should die while giving birth. Globally there is momentum with the update of the UN Secretary General's *Global Strategy for Women Children and Adolescent Health* (2016-2030) and new partnerships and funding streams such as the Global Financing Facility (UN 2016). All these health policies both at the national level and county levels are aimed at improving the health of women by increased access to health services, targeted interventions and increased financing to solve the problem of improving maternal health.

1.3.1 Strategies towards Averting Preventable Maternal Mortality

To understand the strategies toward averting preventable maternal mortality, an understanding of what causes maternal deaths globally and locally is essential. Evidence shows that hemorrhage, hypertensive disorders, and sepsis were responsible for more than half of maternal deaths worldwide between 2003 and 2009. More than a quarter of deaths were attributable to indirect causes (Say et al., 2014). In Kenya, it is reported that the same causes of maternal mortality identified globally such as hemorrhage, sepsis, hypertensive disorders of pregnancy, obstructed labor and complications of induced abortions. It is estimated that postpartum hemorrhage accounts for 25 per cent of the total maternal deaths in Kenya (Desai et al., 2013).

Globally several approaches have been put in place to avert preventable maternal mortality. The WHO's most recent report *"Ending Preventable Maternal Mortality Strategies"* lays out strategies aimed towards ending preventable maternal mortality in the SDG period (WHO, 2016). This report calls for using a human rights approach and eliminating inequities that lead to disparities to access and improving the quality of care. The report also calls for addressing the "obstetric transition" to address indirect causes of maternal death such as high levels of fertility. The report calls for strategic frameworks and calls for countries to shift from focusing on emergency care for a minority of women to wellness-focused care for all. The report advocates for preventive and supportive care that responds to women's needs and strengthens their capabilities in the context of respectful care. Lastly it calls for the promotion of normal reproductive processes with first line management of complications and access to community input (WHO, 2016).

To address some of the barriers to reducing preventable maternal mortality, high quality maternal health services the Kenya Government has also put forward a few policy initiatives aimed at improving the quality of maternal care. The Kenya Reproductive Maternal Newborn Child and adolescent (RMNCAH) health investment framework is a key document that identifies access to quality maternal health services as a significant challenge across all levels of care and goes on to identify inequities with respect to geography, population sub-groups, and economic status that are persist due to supply and demand-side barriers (MOH, 2016). Several policy proposals have been initiated to increase access to health services including maternity services. These include improving coverage for RMNCAH services as a priority for the Government of Kenya as is reflected in its Vision 2030, the Constitution of 2010 and the Fourth National Health Sector Strategic and Investment Plan (2014-2018). Such strategies include addressing (i) disparities in equitable coverage through investments in underserved counties and for marginalized populations including urban slum residents. Recent KDHS 2014 estimates show that there are inequities with regard to facility-based delivery with about 82% of women delivering their most recent baby in a health facility in urban areas whereas in rural areas only 42 % of women delivered their babies in a health facility (Kenya National Bureau of Statistics, 2015). (ii) Prioritize scale-up of proven high impact, evidence-based interventions and (iii) addressing vital gaps in the health system to support new public and private sector investments in the health sector. Sustained and additional health care financing is also essential to reduce the proportion of out-of-pocket payments for maternal health services.

There has been some progress reported in the coverage indicators on maternal health in Kenya. The total fertility rate has declined from 4.6 in 2008/9 to 3.9 in 2014; nearly two thirds (61% of births took place in a health facility and 62% of women were delivered by a skilled birth attendant. Postnatal care increased from 42 percent in 2009 to 51 percent in 2014. The MMR of 362 per 100,000 live births however still remains high and shows insufficient progress (KNBS 2015; see Figure 1.3 below).

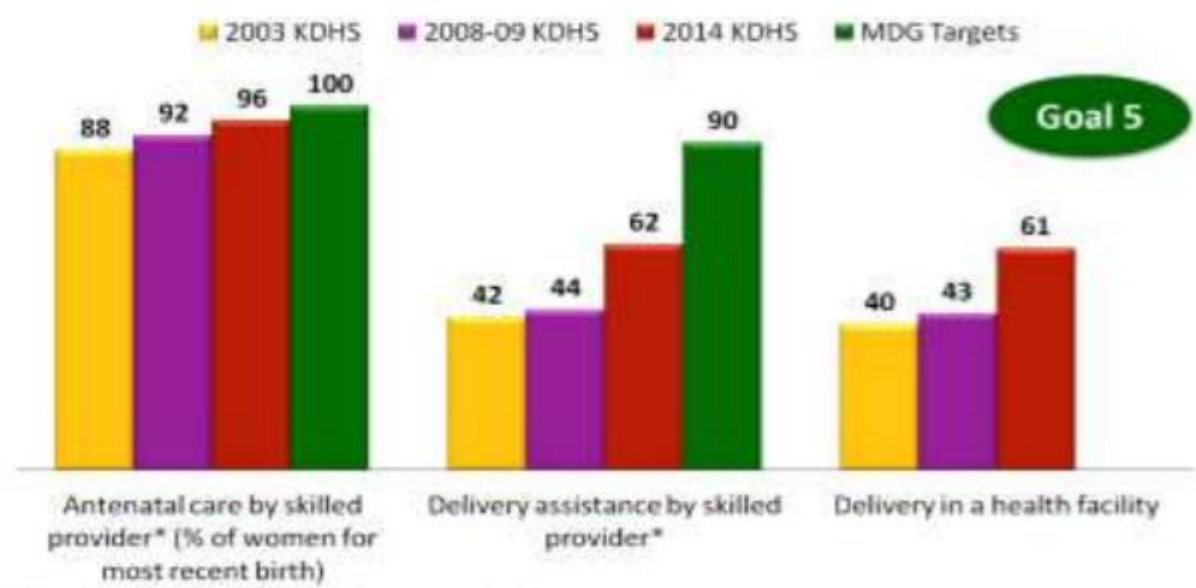

Figure 1.3: Trends in maternal health services provision in Kenya Source: (National Bureau of Statistics Nairobi, 2015b)

Challenges have been identified that are preventing the achievement of progress, these include inequitable coverage among certain parts of the population groups such as rural and urban slum residents including adolescents (Ministry of Health Kenya, 2016). Demand side barriers have been identified that limit access and utilization of proven high impact interventions. Examples include, long distances to health facilities, high delivery services costs, religious and sociocultural beliefs and practices and low status of women as well as lack of knowledge and information (Ministry of Health Kenya, 2016). Other barriers also include provider attitudes, poor quality and limited integration of services that also hamper and discourage utilization of services. Challenges have also been identified on the supply side with the weak performance of the health system in terms of infrastructure, human resources for health (HRH), supply chain, health financing, health Information, and leadership/governance (Ministry of Health Kenya, 2016). Other challenges identified at the health systems level include, poor workforce distribution, weak supply chain management for provision of essential RMNCAH commodities; incomplete and poor quality of data from routine health information systems that hamper evidence-based decision making and accountability for results; devolution and make effective use of resources from both domestic and partners due to capacity challenges and weak coordination at national and county levels (Ministry of Health Kenya, 2016).

1.4 Problem Statement and Research Gap

Understanding the factors underlying access to quality maternity care can provide information that is crucial towards strengthening the maternal health system and reducing maternal mortality. However, as mentioned in section 1.3 above, many studies and interventions have been undertaken in this area. The questions therefore are: What else can be done or done differently to identify these factors? A systematic review by Mustafa & Moyer (2013) reported that most previous studies examining facility-based delivery did not focus on policy levers influential in affecting such delivery; and recommended that further research that is policy-focused can be critical in understanding women's choices regarding facility-based delivery (Moyer & Mustafa, 2013). Likewise, previous studies focusing on the quality of services in maternal health care in Kenya used national assessment tools such as the Service Provision Assessment (2010) to analyze the quality of facility-based care (NCAPD et al., 2011; Diamond-Smith et al 2016). Other studies have focused on the quality of care and its association with poverty levels with women who are poorer receiving poor quality services (Kruk et al., 2016; Sharma et al., 2017). The research has also failed to focus on ranking women's preferences and the health system factors that influence women's choices on a place of delivery. The study will also address the challenge of women's willingness-to -pay for delivery services. This has been a challenge because of the free maternity services women have reported been charged for certain auxiliary items. The hypothesis underlying this approach is that previous research in this area in Kenya have not yielded practical solutions in identifying diverse factors influencing place od delivery. DCEs grew out of a family of initiatives called conjoint choice analysis and are increasingly being used in health economics due to their ability to value both health outcomes and non-health outcomes, including process outcomes such as waiting time, staff attitudes, etc. (Soekhai et al., 2019). The DCE methodology allows the assessment of the relative importance or priorities of these attributes as well as for newly formed health policies.

1.5 Research Objectives and Questions

1.5.1 Aim of the Study

The main objective of this study was to use DCEs to examine Kenyan women's preferences on the factors influencing choice of place of delivery. Women's preferences indicate their perceptions of the quality of care they expect to receive during delivery. The study also aimed to establish the relative rankings of factors that influence the choice of place of delivery and how women trade-off these factors when making a choice of place of delivery.

1.5.2 Specific Objectives

i) To establish the factors affecting women's choice of place of delivery in Embakasi-North sub-County in Nairobi County, and Naivasha sub-County in Nakuru County.

ii) To establish the most important quality of delivery care attribute and relative importance of the different attributes that women value when choosing a place of delivery for women in both Embakasi-North and Naivasha sub-County.

iii) To analyze variables in the use of sociodemographic variables that influence women's choice of place of delivery

iv) To understand the trade-offs women in both settings, make between attributes when choosing a place of delivery

v) To examine using contingent valuation methods the women's willingness to pay for the selected factors that influence place of delivery.

1.5.3 Research Questions

The main research questions that the study addresses are as below: -

i) What are the factors that influence women's choice of place of delivery in Embakasi-North sub-county in Nairobi County, and Naivasha sub-County in Nakuru County?
ii) What is the relative importance of the quality of delivery care attributes of a delivery health facility that women find important when making a choice for a place of delivery?
iii) What are the sociodemographic and health system utilization characteristics of women in these two settings that influence their choice of place of delivery?
iv) What trade-offs do women make when making a choice between the different quality of delivery care attributes of delivery health facilities?
v) What are the estimated willingness-to-pay estimates for the attributes identified by women to influence choice for a place of delivery?

1.6 Significance of the Study

This study focused on two counties in Kenya (Nairobi and Nakuru County) that despite high facility-based delivery of 80% and 70%, respectively, still record high MMR (UNFPA, 2014). DCEs offers an experimental methodology that is appropriate in studying facility-based delivery from a policy perspective. This study's findings will inform policymakers about the facility characteristics that women prefer, thus providing person-centered data for policy formation. In unpacking the different attributes utilizing a choice survey, the DCE methodology will also help us obtain a deeper understanding of what women in these two settings consider quality health care service during their delivery experiences. Specifically, the study will contribute to national health policy objectives concerned with improving maternal and child health as contained in the Kenya Health Policy (2014-2030), the fourth Kenya Health Sector Strategic and Investment Plan (KHSSP 2014-2018), Agenda 4 (launched by H.E. The President of the Republic of Kenya) in March 2019, and which includes implementation of Universal Health Coverage in Kenya by 2022 and Vision 2030 (Ministry of Health, 2018).

Additionally, this study will specifically contribute to the goals of the Reproductive Maternal Neonatal Child Adolescent Health (RMNCAH) investment framework launched in March 2016, the key policy document that sets out Kenya's vision for maternal and reproductive health indicators (Ministry of Health Kenya, 2016). It will assist with providing strategies to deal with the vast inequities in maternal deaths that are identified as a key challenge. All these Kenyan health policies aim to provide equitable and affordable health services to the Kenyan people by ensuring universal health access to quality preventive and curative health care. Establishing health facility preferences of women is important because facility-based delivery and skilled birth attendance is a health service indicator under universal health coverage, UHC (United Nations, 2015).

It is widely understood that skilled birth attendance coverage is linked with a reduction in adverse maternal health outcomes (WHO, 2004); (Ronsmans & Graham, 2006). The research aimed at informing the implementation of Kenya's recent free maternal health policy by providing empirical evidence for ranking women's preferences for place of delivery. The results will allow researchers to better understand theories around what women value when making the decision around choosing a place of delivery and adding to the theories around the determinants of place of delivery. The results of the study detailing the attributes reflecting the quality of delivery care that women find important and the socioeconomic profiles that drive those choices will provide policy makers vital information for planning, and resource allocation in a resource-constrained setting. The findings will also promote a renewed focus on women's preferences, hence fostering patient-centered service delivery and promoting the efficient use of public resources. From a national perspective, this research will contribute to Kenya's efforts to attain SDG 3 targets of improving health and wellbeing, and on SDG targets 3.1 and 3.2, which focus on maternal health in the area of delivery services (United Nations, 2015). It will inform policymakers and program managers, as well as further scholarship on improving the coverage and quality of care women receive during facility-based delivery.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter summarizes the literature explored related to maternal mortality globally, in sub-Saharan Africa and in Kenya. The chapter begins with section 2.2 that discusses the different perspectives used when evaluating the quality of care received by women during maternity services. The chapter then covers in 2.3 a review of the empirical literature on factors influencing facility-based delivery and skilled birth attendance. In section 2.4 the chapter reviews the qualitative evidence on facilitators and barriers to facility-based delivery. In 2.5, the chapter covers focuses on the different conceptual frameworks that have been used to assess the concepts of facility-based delivery. The chapter ends with section 2.6 detailing the study's research conceptual framework that is used to assess the study's research questions and the relationship between the independent and dependent variables.

2.2 Evaluating Quality of Care for Maternity Services

There are different definitions of quality of care. The Institute of Medicine (IOM) in the United States defines quality of care as the "degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine, 2001). The WHO definition of quality of care encompasses six key components or domains: "effectiveness, efficiency, accessibility, safety, patient centeredness and equity" (WHO, 2006). These definitions of quality of care guide the different components required to safeguard quality of care within a health system in global settings. In Kenya, a mapping exercise conducted by the Ministry of Health in Kenya identified and placed the number of health facilities as 8400 facilities. They were categorized as 49% public, 16% private not-for-profit and 33% private for-profit (Ministry of Health, 2013). Although the number of health facilities and health investments in Kenya have increased in the past two decades, improvements in the quality of health services has not accompanied these investments and the quality of care provided at these health facilities is highly variable (Muthaka et al., 2004).

It is widely accepted that poor quality maternal health services compromise efforts to enhance access and coverage to maternal health services. Evidence shows despite 49% of health facilities been classified as public and providing maternal health services in Kenya, there have been concerns around the quality of services with poorer women in Kenya receive lower quality maternal health services (Sharma et al., 2017). Inequities in the quality of care have also been reported across regions with a 25-percentage point gap between the quality of care in Nairobi region and the coastal region. (Arsenault et al., 2019). Quality was also reported to be higher in health facilities with high volume facilities and those with cesarean section capacity. The same evidence showed that women received less than two thirds of basic elements of competent and respectful care for labor and delivery care services (Arsenault et al., 2019). Further investigations on the quality of maternal care functions in health facilities also showed that quality of basic maternal care functions was substantially lower in primary care health facilities when compared to secondary care facilities (Kruk et al., 2016).

Lastly, it has been documented that most health facilities in Kenya providing maternal health services do not have all of the signal functions for example only 46 and 27 percent of health facilities have high and basic scores in routine and emergency obstetric care respectively (Diamond-Smith et al., 2016). Health care users in Kenya have also commonly cited non-availability of medicines as the most important element of quality by health care consumers, and also a key factor in the underuse of public health services (Ministry of Health Kenya, 2016). Additionally, evidence also confirms that inputs are poorly correlated with provision of evidence-based care in clinical services and presence of strong infrastructure might not always equate to a measure of quality of care (Leslie et al., 2017).

To increase the quality of health services at facilities in 2011 the Kenya Quality Model for Health (KQMH) was established. This was a holistic quality management system that was aimed at systematically addressing a range of organizational quality issues with the goal of delivering positive health impacts. The KQMH integrated evidence-based medicine with total quality management and patient partnerships (Ministry of Health, 2014). Upon evaluation it was found that the KQMH did not have the impact that was intended. It was identified that the implementation was not participatory in nature, and its principles were poorly understood by the respective implementers. Hence the Ministry of health is currently putting efforts through the Kenya Health

Policy 2014-2030, and working towards developing a Quality Management Policy to act as a guide for quality management implementation and coordination. The Ministry also aims at establishing a national accreditation framework for the sector through a recognized legal body to accredit health provider institutions to comply with established standards of health care (Ministry of Health, 2018).

Other local service provision strategies have also been put in place through policy. For example, results based financing (RBF) was piloted in Samburu County in 2011 and an end-line evaluation showed progressive increase in the delivery of maternal and newborn health (MNH) services, improvement in the average clinical quality score from 63 to 93 percent as well as improvement in the proportion of facilities holding regular management committee meetings (Ministry of Health Kenya, 2016). Addressing the quality of care provided within health facilities with an aim of reducing maternal mortality and promoting good maternal and newborn health outcomes in Kenya requires an in-depth understanding of contextual factors that influence place of delivery. These factors are discussed in detail in the next section.

2.3 Empirical Literature

Several systematic reviews have been done on the broad topic on facility-based delivery, skilled birth attendance and factors that influence place of delivery. Four of these broad literature reviews focus on low and middle-income countries (LMIC) (Say & Raine, 2007); (Gabrysch & Campbell, 2009) and (Bohren et al., 2014) However, a more recent review, covering studies from 1995 to 2011 focuses exclusively on empirical studies conducted within sub-Saharan Africa (Moyer & Mustafa, 2013). Moyer and Mustafa (2013) found maternal factors to be the most studied factors related to place of delivery, and cross-sectional surveys the methodology most frequently used within studies. (Moyer & Mustafa, 2013). Recent studies that have reviewed demographic health surveys spanning several countries in sub-Saharan Africa have also found a trend of increase in facility- based delivery (Montagu et al., 2017); (Doctor et al., 2018). Kenya is making progress with significant increases in facility-based delivery due to a new free maternity care policy initiated in 2013 (Bourbonnais, 2013).

Different studies showcase interventions aimed at increasing facility-based delivery. One of the randomized controlled trials was set in Zambia, where the intervention was a “mama kit” of necessary supplies for safe delivery. Wang et al. (2016) demonstrated the kit’s impact: it increased the odds of safe delivery by 63% (an increase of almost 10%) and resulted in a cost-effectiveness of 5,183 USD per death averted. This study provided robust evidence on interventions required to boost facility-based delivery in settings with low rates as well as documenting the cost-effectiveness of the suggested interventions (Wang et al., 2016). The intervention studies set in Kenya assessed the use of vouchers for delivery services in Kenya in both rural (Kitui et al., 2017) and urban settings (Obare et al., 2014). These studies showed that interventions such as mother-packs and vouchers increase the number of women accessing facility-based delivery. This was also seen across varying contexts such as Uganda (Massavon et al., 2017).

Other studies such as a randomized controlled trial conducted in western Kenya found that full vouchers, (unsubsidized vouchers that do not require a co-payment) conditional cash transfers, and SMS messages were effective in boosting facility-based delivery in a rural setting (Grépin et al., 2019). The study however, reported that a copayment dramatically reduced the effectiveness of the voucher and hence suggested that cost-sharing policies amongst rural poor may not be an effective strategy. The study also suggested that the free maternity policy did not lead to an increase in demand by women in this setting (Grépin et al., 2019). These findings highlight the need for diverse studies utilizing different methodologies with the potential for different kinds of insights depending on the settings on what works in increasing facility-based delivery.

2.3.1 Maternal Factors

For this study, factors influencing place of delivery were classified into five categories: maternal, social, antenatal care and health facility factors, and access factors. This classification was based on a similar one employed by Moyer and Mustafa (2013) but instead of using macro factors, called "access-related factors," was used. (Moyer & Mustafa, 2013). This classification brings together factors broadly related to geographical access such as distance to the place of delivery, time taken to reach the health facility, infrastructure, and terrain and to economic access, such as the cost of delivery, cost of transportation for referrals.

Several studies Kenya such as (Karanja et al., 2018), (Chea et al., 2018), (Nanjala & Wamalwa, 2012), (Mangeni et al., 2012) and (Banke-Thomas et al., 2017 indicated that the most identified factors influencing facility-based delivery were maternal factors, a finding similar to the review by Moyer and Mustafa (2013). Such factors have been studied widely across many contexts. Amongst the most studied variable was women's education, with women with higher levels of education more likely to access facility-based delivery in several studies across several contexts in Kenya (Nanjala & Wamalwa, 2012); (Mangeni et al., 2012); (Banke-Thomas et al., 2017). Most of the studies conducted in Kenya had a variety of comparisons for education level. Some studies found that women without formal education were less likely to deliver at a health facility e.g., (Chea et al., 2018). Some studies compared having no formal education with primary education and found that those with primary education and above were 6.6 times more likely to seek skilled birth attendance than those with no formal education e.g., (Nyongesa et al., 2018). Some other studies compared primary education and secondary education and found that those mothers with post-secondary-school education were 10 times more likely to deliver at a health facility than at home. Tertiary-educated women were found to be 8.6 times more likely to deliver in a health facility compared to women with no education (Gitimu et al., 2015). In general, highly educated women consistently had a higher likelihood of facility-based delivery and skilled birth attendance than their counterparts with lower levels of education. This may partly reflect the fact that more educated women are likely to have fewer financial barriers to accessing facility-based services compared to the less educated women.

The other important factor determining facility-based delivery is socioeconomic status of women. With literature review of studies from several African demographic health surveys indicating that women in the richest quintile and with at least a primary education were likely to deliver in a health facility (Doctor et al., 2018). Other studies in Kenya, Tanzania, and Ethiopia that used a wealth index to create wealth quintiles found that being in the highest wealth quintile was consistently positively associated with facility-based delivery (Karanja et al., 2018; Bishanga et al., 2018; (Arba et al., 2016). Another Kenyan study assessed household wealth and found that it correlated with skilled birth attendance by about 40% (Van Malderen et al., 2013). A different study that analyzed data from demographic health surveys in several countries, including Kenya, Nigeria, and Tanzania, used family wealth, and found wealth to be positively associated with place of delivery (Tey & Lai, 2013). Thus, it appears that higher socioeconomic status consistently leads to facility-based delivery across varied contexts.

Marital status was one of the variables that showed inconsistent associations with facility-based delivery. For example, while in one pastoralist setting in Kenya being single was positively associated with delivering in a health facility representing independence in decision making

(Karanja et al., 2018), in another setting in Ethiopia, being unmarried meant that decision making was under the spouse and other family members and acted as a deterrent to facility-based delivery (Abebe et al., 2012). Both studies confirmed a positive association between women being unmarried with the likelihood of delivery at a health facility (Ochako et al., 2011) (Karanja et al., 2018). The study by Karanja et al. (2018) reported that unmarried women in the pastoralist community have 2.4 adjusted odds of delivery at a health facility compared to married women. A different study by Ochako et al. (2011) found that women who have never been married are the most likely users of skilled birth attendance for delivery and attribute it to their higher autonomy and lack of dependence on mothers-in-law or husbands. Another study in Ethiopian (Bayou et al., 2015) examined women in an urban setting who had missed an opportunity for facility-based delivery. This study found that single women were twice as likely to deliver at home when compared to married women. The researchers explain this finding by theorizing that single women are likely to have unintended pregnancies at a young age and because of the shame that accrues to the family choose to deliver at home.

Literature review also identified parity as a factor that influences place of delivery. High parity was associated with home deliveries and, conversely, lower parity was associated with delivery in a health facility. This has been previously explained as possibly resulting from women having no one to take care of the women's other children (Gabrysch & Campbell, 2009). Other studies assessing parity found that women with low parity across several contexts were likely to deliver their babies at a health facility in Kenya (Ochako et al., 2011) ;(Kitui et al., 2013); (Karanja et al., 2018); (Gitonga & Muiruri 2016); (Banke-Thomas et al., 2017); Ethiopia (Dahiru & Oche, 2015); Sudan (Mustafa & Mukhtar, 2015); Tanzania (Bishanga et al., 2018) and Ghana (Manyeh et al., 2017).

Age has also been shown to influence facility-based delivery in several contexts with most studies showing that younger women are more likely to utilize facility-based delivery. For example, Mwangi et al. (2018) a study aimed at assessing the uptake of skilled birth attendance along the continuum of care in Western Kenya using a cross-sectional survey found that being younger than 34 years old gave a woman 1.7 times the odds of delivering at a health facility in western Kenya. Likewise, Gitonga and Muiruri (2016) in a study aimed at assessing the determinants of health facility delivery in Tharaka-Nithi in Kenya found that facility-based deliveries were highest (80%) amongst women aged between 20 and 34 years. Some studies in western Africa, however, showed a negative association between age and facility-based delivery. For example, a study in northern Nigeria aimed at assessing the determinant of home delivery using a cross-sectional survey identified younger women, aged between 25 and 34 years, as being more likely to deliver at home because of the attitude of healthcare workers in general and the presence of male healthcare workers at the facility in particular (Abubakar et al., 2017). Another study in Ghana assessing the determinants of skilled birth attendance using a cross sectional survey showed that younger women were less likely to deliver with skilled birth attendants (Manyeh et al., 2017).

Place of residence has also been shown to influence the place of delivery. For example, four cross-sectional Kenyan studies identified women's residence as influencing place of delivery. Out of these studies, three were based on an analysis of the nationally representative Kenya Demographic Health Survey (Kenya National Bureau of Statistics, 2015). Two of the studies focused on young women (Ochako et al., 2011; Banke-Thomas et al., 2017; Kitui et al., 2013) again using the national representative sample, found that women living in an urban area are more than twice as likely to delivery in a health facility. Focusing on informal settlements in Nairobi, Fotso et al. (2009) also established that urban residence is positively associated with facility-based delivery.

Employment status is another factor that affects place of delivery. Using a multivariable model that adjusted for confounding maternal characteristics, employment status was found to be associated with delivery by a skilled birth attendant (Mangeni et al., 2012). In a study in Zimbabwe, women who were unemployed in a certain ward in a district had a 2.5 odds of having a home delivery (Ntenda et al., 2019).

Some studies have shown that religion is also associated with place of delivery. In Kenya, for, example, Banke-Thomas et al. (2017) analyzed national representative KDHS data to assess maternal health service utilization amongst adolescent mothers and found religion to have a positive association with facility-based delivery, with Christian women more likely to deliver in facilities compared to non-Christians. Those women with no belief in religion were about three times less likely to utilize skilled birth attendance compared to those women following the Roman Catholic faith.

Ethnicity has also been identified as a factor that influences place of delivery. For example, Ochako et al. (2011) in a cross-sectional study aimed at assessing the factors influencing place of delivery amongst young women found that women from the Kikuyu ethnic group in Kenya were more likely to use skilled birth attendance compared to other communities. This was attributed to their easy access to services and flow of information from Nairobi, based on their proximity to the city. Banke-Thomas et al. (2017), on the other hand, while finding that the ethnicity is a significant predictor for skilled birth attendance, reported that adolescent women from ethnicities such as the Maasai in Kenya were three times less likely to use skilled birth attendance. Studies in neighboring countries such as Tanzania, have also assessed ethnicity as a variable influencing place of delivery, and found that women from the Sukuma ethnic group were 60% less likely to deliver at a health facility as compared to women from the Pogoro ethnic group (Exavery et al., 2014).

Regions of residence also influenced place of delivery for instance one study analyzed KDHS data and discovered that access to skilled birth attendance differed across provinces in Kenya (Van Malderen et al., 2013). One study in Kenya focused both on region and adolescent mothers (Banke-Thomas et al., 2017). Adolescents from the Rift Valley and Coast provinces were reported to be five times less likely to use skilled birth attendance compared to adolescents from central Kenya. These differences were attributed to low levels of skilled birth attendance, bad road infrastructure, and generally sparsely distributed health facilities within the Rift Valley province compared to Central Province (Ochako et al., 2011).

A woman's level of autonomy also greatly influenced where she delivered. For example, a study by Tey and Lai (2013) that compared demographic health survey data from multiple low-income countries (Nigeria, Kenya, Tanzania, Bangladesh, India, and Pakistan) found a negative association between facility-based delivery and decision making in all the other countries with the exception of Nigeria. Other studies have focused on access to information and media influence. Access to functional media was found to be significantly associated with institutional delivery service utilization in Ethiopia (Kidanu et al., 2017), (Kenea & Jisha, 2017) and in a multi-country study spanning Nigeria, Kenya, and Tanzania (Tey & Lai, 2013).

In Kenya, Achia and Mageto (2015) found that media exposure at the community level was associated with institutional delivery. Another Kenyan study focused on adolescent mothers in the 2014 KDHS and found that those with mass media exposure were twice as likely to use institutional delivery (Banke-Thomas et al., 2017). In Malawi, using demographic health survey data, Ntenda et al. (2019) compared the association between institutional delivery in two time periods (2010 and 2015–16) and found that media exposure was significantly associated with institutional delivery in the earlier period.

Access to health insurance has also been shown to influence place of delivery with women with health insurance more likely to deliver in a health facility than women without health insurance. Were et al. (2017) found through analyzing KDHS data that women with insurance were 27% more likely to deliver at a health facility than women without health insurance. In a study examining individual- and community-level factors associated with adequate use of maternal and antenatal health services in Kenya, Achia and Mageto et al. (2015) found that having access to health insurance was one of the individual factors that influenced place of delivery.

2.3.2 Social Factors

Social factors that influence place of delivery that are studied mostly review women's husbands and their education and occupational status. Evidence shows that women whose husbands had at least a secondary education were significantly more likely to choose facility-based delivery. In a cross-sectional study in Kenya, Gitimu et al. (2015) found that a woman whose partner had at least a secondary education was three times more likely to seek skilled delivery. Similarly, women whose husbands were formally employed were more likely to delivery in health facilities than women whose husbands were involved in decision making about place of delivery. Nanjala and Wamalwa (2012) found that the male partner's level of income and his support for skilled delivery significantly influenced skilled birth attendance in a setting in western Kenya.

HIV-positive status/HAART have also been reported to influence place of delivery. For example, Kinuthia et al. (2015) and Chea et al. (2018) reported that women who were HIV positive and on highly active antiretroviral treatment (HAART) were less likely to deliver in a health facility.

The role of unskilled birth attendants in influencing place of delivery has also been studied. For example, traditions and customs that promote home deliveries assisted by unskilled birth attendants have been reported amongst pastoralist communities in Kenya (Karanja et al., 2018) and in Ethiopia (Shiferaw et al., 2013). In the Ethiopian study, for example, 78% of women of delivering women were attended by traditional birth attendants (TBAs). The women in these settings viewed the TBAs as culturally acceptable and competent.

2.3.3 Health-Facility and Antenatal Care-Related (ANC) Factors

Several health facility and antenatal care (ANC) related factors were found to be positively associated with facility-based delivery. ANC related factors are those that are associated with receiving ANC care and meeting the threshold for the minimum four ANC visits were most associated with delivery at a health facility.

The most identified health facility factor discouraging delivery at facility was the attitude of healthcare workers, with reports of mistreatment/disrespect and abuse reported in some cases. Studies describing mistreatment have been undertaken in several countries including Kenya (Abuya et al., 2015; Oluoch-Aridi et al., 2018; Karanja et al., 2018), Nigeria (Abubakar et al., 2017) and Ethiopia (Ababulgu & Bekuma, 2016; Belay & Sendo, 2016).

The second health facility factor that has been studied is the presence of healthcare workers. For example, the presence of female healthcare workers in Kenya was a significant predictor of facility delivery, especially in remote contexts such as rural areas or pastoralist settings (Nyongesa et al., 2018; Karanja et al., 2018). This has also been reported in parts of countries, for example Nigeria, with religious customs that restrict female contact with men (Abubakar et al., 2017).

Past experience of delivery at a particular facility may also influence subsequent facility delivery for example, studies have shown that if the women had a positive health facility delivery experience then they were more likely to deliver their subsequent babies at the same facilities, or to inform other people of their delivery experience there (Mwangi et al., 2018; Karanja et al., 2018; Adewemimo et al., 2014).

The presence of a policy of free maternity services can also influence facility-based delivery. For example, two studies in Kenya found that women were more likely to deliver at public health facilities where there were no charges for delivery than at private health facilities or at home (Calhoun et al., 2018; Nyongesa et al., 2018). Other studies assessed women through a birthing plan or insisted on a particular birthing position (Karanja et al., 2018) offered family planning services (Exavery et al., 2014; Karanja et al., 2018) or had essential supplies and drugs (Mwangi et al., 2018). All these factors were found to influence place of delivery.

2.3.4 Access Factors

Studies that showcased Access factors reviewed the association between facility-based delivery and distance, transportation, and costs. The most studied access factor was distance. As expected, health facilities that were away from women's homes were negatively associated with facility-based delivery. Chea et al. (2018) described barriers to access to infrastructure such as the road systems in some parts of rural coastal Kenya acting as a barrier to reaching health facilities. There was a negative association, with studies showing women who could not afford the costs of delivery opting out of facility-based delivery across contexts. Two studies assessed the role of savings in Kenya and Nigeria/Ghana, respectively, and found that women with savings were more likely to deliver at a health facility (Nyongesa et al., 2018;Jennings et al., 2017) issue of high costs included incurring the costs of referral services, which may act as an impediment to delivery services. One Kenyan study that reported on cost as a factor influencing place of delivery after the introduction of free delivery services, particularly amongst women with HIV. About 43% reported cost as a major impediment to facility-based delivery (Kinuthia et al., 2015).

2.4 Qualitative Studies on Facilitators and Barriers to Facility-Based Delivery

Qualitative studies are focused on the how and why phenomena happen. Based on the 15 qualitative studies using a mix of methods such as in-depth individual interviews and focus group discussions. The study results were organized according to the factors identified, additionally facilitators or barriers toward facility-based delivery or skilled birth attendance were identified.

Study participants selected for inclusion in these studies included a wide range of stakeholders, such as women who had delivered within a range of periods, skilled birth attendants, traditional birth attendants' community health workers and Ministry of Health officials. The conceptual framework proposed by Bohren et al. (2014) was used to organize the findings of the studies into the "facilitators" and "barriers" to facility-based delivery and/or skilled birth attendance. (See Figure 2.2.) A recent qualitative evidence synthesis by Nyakang'o and Booth (2018) that focused on the barriers faced by women living in rural areas in Kenya was also applied to further understand the barriers to facility-based delivery. Although the Bohren et al. work covers various low- and middle-income countries, this study focused on the Kenyan context alone to better understand what acts as a facilitator or a barrier in both rural and urban settings in Kenya. Bohren et al. (2014) identifies four themes, namely: (1) perceptions of pregnancy and childbirth; (2) influence of sociocultural experience; (3) resource availability and access; and 4) perceptions of quality of care. The themes are discussed in detail in section 2.4.1 below.

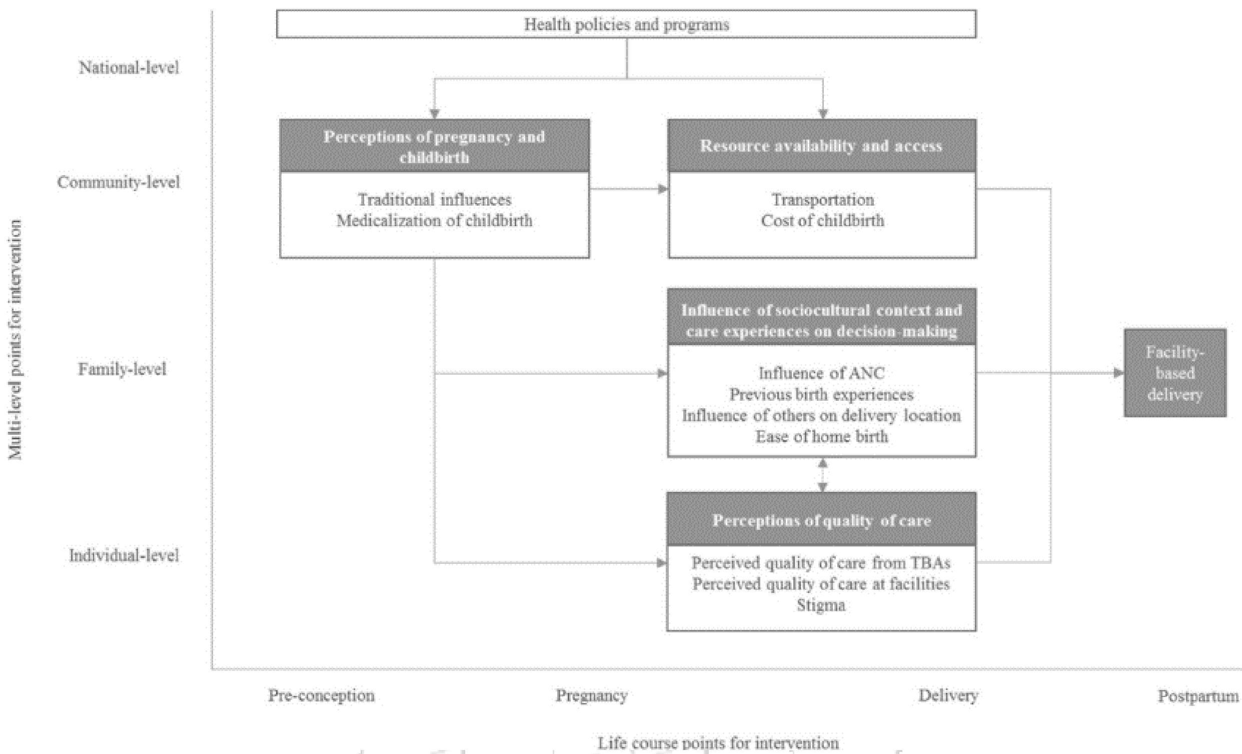

Figure 2.1: Multi-level life course framework of facility-based delivery adapted to fit the Kenyan context

2.4.1 Perceptions of pregnancy and childbirth

Facilitators. *Delivery preparedness knowledge.* Women who had knowledge about delivery preparedness and appreciation of modern medicine were more likely to deliver at a health facility. Mothers also chose to deliver at a health facility depending on their health conditions. Awareness of obstetric complications and perceptions of facility-based delivery as safe led women to deliver in facilities. In some contexts, such as pastoralist societies and in parts of rural western Kenya, women believed that health facilities would provide better management of complications than if they gave birth at home with an unskilled birth attendant (Mason et al., 2015; Karanja et al., 2018). In addition, other women's past experiences encouraged women to deliver at a health facility, especially if they were treated well, and they heard positive experiences being shared.

Barriers. *History of a previous home delivery.* A woman's perceived need of whether a facility-based delivery was necessary acted as a barrier to her delivering in a health facility. Women in several contexts, such as rural areas and pastoralist communities, lacked knowledge on pregnancy and did not perceive the need for a health facility for delivery. They saw it as unnecessary and only went to a facility to deliver in the case of complications (Mwangome et al., 2012; Naanyu et al., 2018; Chea et al., 2018; Karanja et al., 2018). Women also seemed to have a low awareness of the risks of home delivery because sometimes they had had successful home deliveries (Caulfield et al., 2016). Women who lived in rural areas generally had low birth-preparedness and perceived delivery at a health facility to be unnecessary (Byrne et al., 2016). They did not take advantage of ANC early in their pregnancy and did not know the timing of labor, generally they were not prepared for pregnancy (Naanyu et al., 2018).

2.4.2 Influence of Sociocultural and Care Experiences

Facilitators. *Decision making on place of delivery.* In certain contexts, in Kenya, such as pastoralist communities, women did not make the decisions about where to deliver their babies. One study found that mothers-in-law or their husbands influenced the decisions of women in a pastoralist setting (Karanja et al., 2018).

Pregnancy support during delivery. Few of the reviewed studies enumerated social factors that facilitated facility-based delivery. Community member awareness of the importance of facility-based delivery encouraged women to deliver at health facilities. Pregnancy support was considered a female activity and a cultural norm, as described in a study set in western Kenya (Naanyu et al., 2018).

Use of traditional birth attendants. In some settings traditional birth attendants were facilitators of facility-based delivery and were responsible for escorting women to health facilities to delivery (Naanyu et al., 2018; Mason et al., 2015)

Barriers. *Past experiences of other women* in some instances, their own past experiences or those of other women discouraged women from delivering at a health facility, especially if the women had received harsh treatment. Women who had successfully delivered their babies without any complications believed that they did not need to deliver at a health facility (Naanyu et al., 2018).

Use of traditional birth attendants Several studies provided evidence that TBAs are still in operation in communities of various types in different parts of Kenya: pastoralist (Karanja et al., 2018); semi-nomadic (Byrne et al., 2016; Caulfield et al., 2016); rural (Naanyu et al., 2018; Mason et al., 2015) and urban (Essendi et al., 2011). In most of these studies there was a perception that TBAs are accessible, valued, and provide good-quality services, including practical and emotional support to women during pregnancy, delivery, and postpartum stages. They have also been described as providing heated delivery rooms (Caulfield et al., 2016). The availability of traditional birth attendants in the local community has acted for many women as a deterrent to delivering at a health facility despite the Government policy not acknowledging the existence of traditional birth attendants (Naanyu et al., 2018). Several studies in this review described TBA's working well with the women in certain particularly rural and pastoralist contexts. However, TBAs are also known to maintain some practices that are harmful and are generally considered unable to manage obstetric complications (Byrne et al., 2016; Caulfield et al., 2016).

Use of male healthcare providers at health facilities. In certain settings the gender of healthcare workers determined if women delivered at a health facility or not. The presence and participation in deliveries of male nurses acted as a deterrent to hospital or facility deliveries in certain settings with strong cultural beliefs with regards to gender roles (Caulfield et al., 2016; Karanja et al., 2018).

2.4.3 Resource Availability and Access

Facilitators. *Geographical access*. Health facilities close to where women lived acted as facilitators for delivery. Places where women had access to transportation to different health facilities also facilitated access to delivery services. (Caulfield et al., 2016; Karanja et al., 2018)

Barriers. Several studies described situations in parts of Kenya where health facilities are still largely inaccessible due to poor infrastructure, such as bad roads. Studies showed that in semi-pastoralist contexts in Samburu and Laikipia counties, women were particularly vulnerable to distance barriers and described experiences where women could not access health facilities due to the distances involved (Caulfield et al. 2016). Other studies in coastal areas such as Malindi describe long distances and inconvenient transportation to health facilities (Echoka et al., 2014; Chea et al., 2018).

Barriers. *Costs*. Women complained about the costs of transportation to a health facility because of the long distances. Caulfield et al. (2016) interviewed women in semi nomadic and pastoralist settings who said that they found it too expensive to pay for transportation and had home deliveries instead. Another study set in western Kenya Mason et al. (2015) described health facilities as being costly for delivery services, and therefore women preferred to visit TBAs because they offered flexible payment plans for deliveries.

2.4.4 Perceptions of Health Facilities Providing Quality of Care

Facilitators. *Facilities perceived as providing high quality of care.* Chea et al. (2018) describes some health facilities in certain communities where there were skilled birth attendants who were additionally able to provide specific services such as prevention of mother to child transmission (PMTCT). The women also described good reception at certain hospitals

Barriers *Facilities perceived as providing low quality of care.* In a study in a semi-nomadic context Caulfield et al. (2016) described skilled birth attendants as having negative attitudes towards women and acting as a deterrent to facility-based delivery, with women resorting to home deliveries. Other studies specifically described healthcare workers in a facility having a negative attitude towards women in labor receiving support from their male partners, which the women described as important as a form of emotional support as they delivered (Kwambai et al., 2013). In certain health facilities Karanja et al. (2018) describe situations of women not being allowed the freedom to choose birthing positions. Additionally, some health facilities lacked basic infrastructure such as electricity, water, poor roads and drugs and equipment essential for delivery services. There were also instances where the health facilities lacked basic amenities like food for the women delivering particularly at night (Essendi et al., 2015). Human resources issues were prevalent, with some described long waiting times for care (Mason et al., 2015).

Mistreatment and abuse. Women's past experiences with healthcare providers provided an important decision point for whether one should use a particular health facility. Many women described negative experiences at health facilities, including mistreatment by healthcare workers and verbal and physical abuse during delivery care; not surprisingly, such experiences acted as deterrents to facility-based delivery (Caulfield et al. 2016). Other instances of mistreatment, disrespect, and abuse were described by several studies across contexts in Kenya (Oluoch-Aridi et al., 2018; Karanja et al., 2018; Chea et al., 2018). In some settings healthcare workers were described as "inhospitable" (Essendi et al., 2015), and in some instances women described them as having "poor customer care" (Mwangome et al., 2012).

Stigma and discrimination. There exists a certain social stigma around home deliveries by women who are HIV positive, whose home deliveries were the subject of gossip in villages as a result of this stigma, the HIV positive women eventually opted for health facility deliveries (Chea et al., 2018).

2.5 Conceptual Frameworks

There are various theories in the field of economics that explain concepts of utility and value. This section will examine two broad theories that address how groups of people value different attributes. Random utility theory and Lancaster's (1966) theory of value, described below, are among the probabilistic choice theories that form the basis for discrete choice experiments (DCEs), the theoretical framework followed in this study. Coming from the discipline of health economics, DCEs use the economic evaluation methodology of conjoint analysis, employing stated preferences that can be used to elucidate the characteristics important to women's preferences for a place of delivery.

2.5.1 Lancaster's Theory and Random Utility Theory (RUT)

DCEs draw upon Lancaster's economic theory of value (Lancaster, 1966) and random utility theory (McFadden, 1974) relying on the assumptions of economic rationality and utility maximization. The stated preferences data are obtained from choice surveys (Hall et al., 2004). In Mangham's 2009 "how to do (or not do)" a DCE article, when individuals state their preferences they are assumed to choose the alternative that yields the highest benefit, known as utility (Mangham et al., 2009). The utility yielded by an alternative is assumed to depend on the utilities associated with its composing attributes and attribute levels (Lancaster 1966).

Ryan, Karen, and Amaya-Amaya (2008) differentiate discrete choice theory from consumer theory and explain that DCEs draw from Lancaster's 1966 idea that it is the attributes of the goods that determine the utility they provide. As opposed to the continuous space of products in consumer theory, discrete choice theory deals with a choice among a set of finite and mutually exclusive alternatives. The individual chooses one and only one alternative from this set. Lastly, while classic consumer theory assumes deterministic behavior, discrete choice theory introduces the idea that individual choice behavior is intrinsically probabilistic, and hence random (Ryan and Gerard, 2003).

The latent utility of an alternative *i* in a choice set *Cn* (as perceived by individual *n*) is considered to be decomposable into two additively separable parts: 1) a systematic, explainable component specified as a function of (i.e., caused by) the attributes of the alternatives V (Xin, β), and 2) a random (unexplainable component) representing unmeasured variation in preferences. This random variation may be due to unobserved attributes affecting choice, inter-individual differences in utility depending upon heterogeneity in tastes, measurement errors, and/or functional specifications. (M. Ryan, Gerard, & Amaya-Amaya, 2008)

$$U_{in}=VX_{in},\ \beta+\varepsilon_{in} \ldots\ldots\ldots \text{(Equation 2.1)}$$

According to Ryan et al. (2008), the key assumption is that the individual n will choose alternative *i* if and only if that alternative maximizes their utility amongst all n alternatives that are included in the choice set Xin.

2.5.2 Literature on Maternal Health Related Discrete Choice Experiments

DCEs are increasingly being used in healthcare to assess patient's preferences for different healthcare procedures (Ryan and Farrar, 2000). Studies that have focused on understanding how patients value different health service characteristics through discrete choice experiments (DCEs) have been conducted in other sub-Saharan African rural contexts, including Tanzania (Kruk et al., 2009), Ethiopia (Kruk et al., 2010), South Africa (Honda et al., 2015) and Zambia (Hanson et al., 2005). The DCE conducted in rural Tanzania assessed factors influencing place of delivery and found out that the most important health-facility attributes were a respectful provider attitude and the availability of drugs and equipment (Kruk et al., 2009). Another study using DCE undertaken in rural Ethiopia reviewed women's preferences for obstetric care in rural Ethiopia and found out that women had the strongest preferences for a health facility with availability of medical equipment and drugs, seeing a healthcare worker over a health extension worker and lastly a receptive health provider attitude (Kruk et al., 2010). A more recent study using DCE conducted in Tanzania (Larson et al., 2015) also showed that respectful treatment by the doctor, followed by a doctor with excellent medical knowledge and modern medical equipment and drugs, in that order were valued health system characteristics in choice of place of delivery. Hanson et al. (2005)

assessed the factors influencing the demand for hospital care focusing on the role of perceived quality of care for two acute medical conditions; cerebral malaria in adults and acute pneumonia in children. They found that the technical quality of care as represented by thoroughness of examination was the most important quality attribute, followed by staff attitudes and drug availability.

2.5.3 Conceptual Frameworks for Assessing Facility-Based Delivery

There are several conceptual frameworks that assess facility-based delivery and skilled birth attendance in sub-Saharan Africa. The earliest and most impactful was the seminal Thaddeus and Maine framework, also known as the "three delays framework" (Thaddeus and Maine, 1994). This framework describes women's access to health facilities in three delays: the delay to make the decision to seek care at a health facility; the delay to get to the health facility; and the delay to receive care while at the health facility. These three delays were described as driving maternal mortality in low-and middle-income settings and were applied mainly to home births with complications. The authors concluded that distance, cost, and quality of care are insufficient to predict facility utilization, and other factors, such as severity of illness and socioeconomic status also influence utilization.

Garbrysh and Campbell (2009) updated this theory to include what they described as "preventive" facility delivery for uncomplicated births and delineated the determinants for facility-based delivery. They identified twenty determinants that they grouped under four themes: (1) sociocultural factors, (2) perceived benefit/need of skilled attendance, (3) economic accessibility, and (4) physical accessibility (Gabrysch and Campbell, 2009). In a multivariate analysis, the paper established that the sociocultural factors most consistently associated with receiving care are higher maternal age, lower parity, maternal education, and higher-household economic factors. The authors concluded that variables of perceived benefit/need and physical accessibility have been neglected when studying factors influential to institutional delivery. They call for further studies that can address a comparative analysis of the determinants of preventative-care seeking, with care seeking for emergencies, a better exploration of the influence of geographical distance and service quality. They also recommend better conceptual development of quality of care and the inclusion of community-related effects in more studies exploring the determinants of delivery care (Gabrysch and Campbell, 2009).

Say and Raine (2007) is a systematic quantitative review exploring studies from thirty countries in total, with only eight countries located in sub-Saharan Africa. The authors concluded that there was wide variation in the factors that affect maternal health utilization and that utilization rates were dependent on the methodological factors used in identification of populations under study and differences related to the profile of the users of health care. They also postulated that the supply of health care contributed to the variation in utilization and interaction of factors such as perceived quality of care. They concluded that context-specific causes of the variation in utilization of maternal health services need to be investigated further (Say and Raine, 2007).

Moyer and Mustafa (2013) explored factors associated with facility-based delivery with a primary outcome of facility-based delivery, delivery location, and skilled birth attendance in a study encompassing all sub-Saharan African countries between 1995 and 2011. They concluded that the factors associated with facility-based delivery were maternal, social, antenatal, facility-related, and macro-level, and that because of the reliance on household surveys, the most-studied factors were maternal factors (Moyer and Mustafa, 2013). They identified the weakness of the use of household surveys in assessment of facility-based delivery as being prone to social desirability bias because of the verbal interview of the women within the household. They suggested that this strategy limited the number kind of questions, thus affecting the eventual results. They also mentioned that the prevalent use of household surveys limits the study of community-based factors that affect facility-based delivery and concluded that there is a need to use alternative study methodologies that can assess measuring social norms, social networks, individual integration into social networks, availability of social support, community-level attitudes toward health behaviors, and decision-making patterns within extended families (Moyer and Mustafa, 2013).

The WHO frameworks on quality of care for maternal and newborn health provides a conceptual framework for understanding the provision of high-quality care is central to improving women's satisfaction with health services. In a setting with increasing facility-based delivery, it is critical to additionally assess the quality of care being provided, both by the health facilities serving women and at the community level. The WHO definition of quality of care is "the extent to which health care services provided to individuals and patient populations improve desired health outcomes" (WHO, 2016). The WHO framework for quality of care defines quality health care as having the following quality characteristics: safety, effectiveness, timeliness, efficiency equity and patient centered (WHO, 2016). The WHO framework builds on the Donabedian (Donabedian, 1988) and Hulton frameworks (Hulton et al., 2007) to show how the health system provides the structure in which care is provided; the provision and experience of care are both important components of the process of care, and the outcome is comprised of both individual and facility level outcomes.

The different domains that fall within the framework provide targets to assess, improve and monitor the care provided within the context of the health system. The quality of care section is divided into two main sections: provision of care and the experience of care. The framework identifies eight domains that should be targeted to assess, improve and monitor care in health facilities in the context of the health system. The provision of care mainly assesses the health facility processes that are conducted by the health care worker such as evidence based practices of clinical routine care and management of complications during delivery. It also addresses the actionable information systems and reviews the roles of functional referral systems.

The experience of care section highlights quality of the care as experienced by the women, their children and their families. It includes aspects of how the health care workers communicated with the women. Interpersonal treatment that upholds the woman's dignity and is respectful in nature and providing the emotional support needed such as allowing a companion of choice during labor and childbirth to provide support to the woman. The availability of a competent health workforce and the physical resources such as equipment and supplies are crosscutting between the provision and experience of care and are aspects of quality of care that are easily observable by the women in any setting.

The WHO has provided standards for improving quality of maternal and newborn care in health facilities, establishing standards and measures that can be used to identify the gaps in the quality of care being provided and improve the provision and experience of care. This will allow health policy makers and providers to assess the performance of processes that need improvement as well as the impact of interventions, with a goal of improving the quality of care provided at health facilities. The WHO quality of care framework (World Health Organization, 2016).

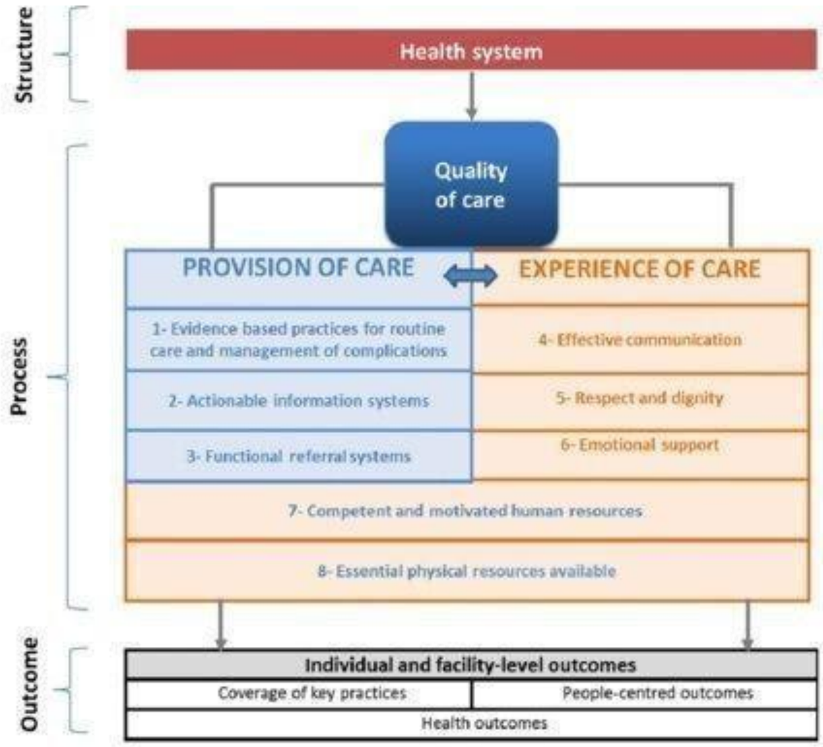

Figure 2.3: The WHO quality of care framework. World Health Organization, (2016).

The health belief model will be used to understand women's choices and decision making around place of delivery. The health belief model hypothesizes that the health-related action depends upon three factors 1) the existence of sufficient motivation to make health issues relevant 2) the belief that one is susceptible to a serious health problem or to the threat of that illness and 3) the belief that following a particular health recommendation would be beneficial in reducing the perceived threat at a subjectively acceptable costs (Rosenstock, 1974).

2.6 The study's conceptual framework

The researcher's interest was in studying the perceptions and experiences of women, specifically focused on the quality of care that they receive during delivery at health facilities. This research conceptual framework is an adaptation based on the WHO framework (WHO 2016) and has been used operationalized to the characteristics of a health facility that women identify as providing high quality care. The conceptual framework for this study (*Figure 2.4: The research study's Conceptual framework showing independent and dependent variables.*)

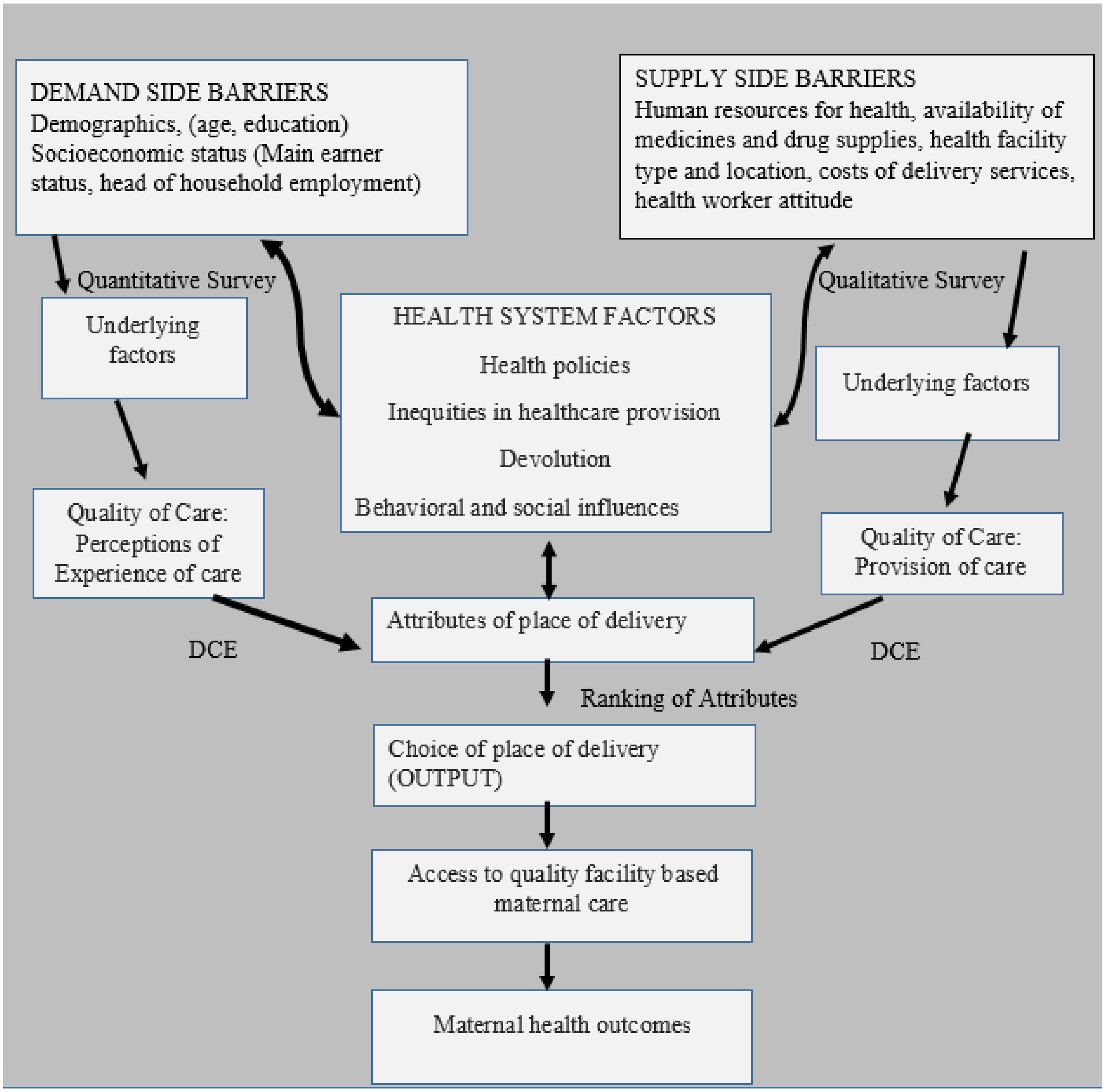

Figure 2.4: The Conceptual framework used in the study to show relationships between independent and dependent variables

The conceptual framework details both the demand and supply side barriers to access to facility-based delivery. These are independent variables that will be assessed both by a quantitative survey and a qualitative survey. These are both presented as underlying factors that influence both the perceptions of experience of care and provision of care. These will be interacted in the model with contextual health system factors that include policies such as the free maternity services policies, the devolved health system at the county level and the behavioral and social influences that affect decision making on place of delivery. Other independent variables will be represented by the attributes of place of delivery that will be identified from the literature and through a qualitative study. The dependent variable will be the choice of place of delivery and this will be represented through the choice of a hypothetical health facility A or B represented by the attributes selected. An option for opting out of both health facilities and selecting a home delivery is also available. The end outcomes to be assessed is access to quality facility-based delivery and positive maternal health outcomes.

The researcher conducted a qualitative study to narrow down on the factors that influence place of delivery based on women's experiences of delivery and this corresponded to *research question one: What are the factors that influence the choice of place of delivery in a Embakasi-North Sub-county and Naivasha sub-County?* The identified factors were based on women's experiences and corresponded to the literature on facility-based delivery. The identified factors were then subjected to a Discrete Choice Experiment that was a hypothetical exercise that aimed at understanding how women could relatively rank the attributes of place of delivery that they found important to them. This allowed the researcher to answer *research question number two, what is the relative ranking of the attributes of place of delivery that women in Embakasi-North and Naivasha find important?*

The DCE applied the random utility framework for ranking of attributes/ domains based on what attributes of the place of delivery provided the women with the highest utility possible. The utility yielded by a chosen alternative is assumed to depend on the utilities associated with its composing attributes and attribute levels. This was based on attributes that were narrowed down to women's perceptions and experiences of the delivery experiences. These in turn were based on easily observable features of the health system that corresponded to most of the domains within the experience of care such as the attitude of health care workers and their ability to provide respectful and dignified care. The only attribute that was observable under the section on the provision of care was the domain regarding functional referral systems. The other domains such as evidence-based practices and use of information technology in decision making were beyond women's observable experience and were hence not assessed or raised by the women during the qualitative study.

The research question three was w*hat sociodemographic characteristics of the woman influence their choice of health facility-based on the chosen attributes of place of delivery?* This question aimed to use logistic regression methods to identify women's individual characteristics that drove their choices of attributes. Research question four and five on *what are the trade-offs that women make when making the choice of a place of delivery and what are the estimates for and the willingness-to-pay?* Both questions are based on the econometric models of the DCE that posit that women are rational people and will respond to the attributes of the health facility-based on what they value. The willingness- to-pay is a contingent valuation technique that generally assumes the marginal utility of income is constant. They can be used to assess welfare measures (Johnson et al., 2011). This followed the steps of a DCE whereby a quantitative component that was composed of experimental design, data collection and analysis. The DCE experiment concluded with the interpretation of the results for policy relevance.

In summary the study applied a conceptual framework to understand women's preferences for place of delivery in a rural and peri-urban setting. The qualitative study was assessed using Bohren's framework on understanding facilitators and barriers to facility-based delivery in low-income settings (Bohren et al., 2014). The quantitative study used the WHO framework to aid in understanding what attributes of health facility are important both in the provision and experience of care as well as the individual level outcomes. The DCE and its economic framework provided an understanding of preferences and what women value in the attributes of place of delivery that influence their choice of a delivery health facility.

2.7 Chapter Summary

The literature review suggests that maternal mortality continues to rise in sub-Saharan Africa and progress in reducing mortality in Kenya is insufficient. Despite increased coverage of facility-based delivery and skilled birth attendance particularly in public health facilities and in urban areas (Calhoun et al., 2018). The evidence for Kenya also points towards general preference for referral to higher-level public health facilities by women in certain settings (Njuguna et al., 2017). Despite all these efforts Kenyan women continue to die from preventable causes of maternal mortality. Of the interventions described in studies in both rural and urban areas, such as vouchers for facility-based delivery, mama kits seem to have been successful in increasing uptake for facility-based delivery in certain settings within the country (Kitui et al., 2017; Obare et al., 2014).

Although there are mixed results, recent evidence seems to show that the policy change to free maternity has not led to an increase in facility-based delivery in some rural areas (Grépin et al., 2019), and has also not led to reductions in maternal mortality particularly in rural areas (Gitobu et al., 2018). Studies set in rural areas in Kenya continue to describe women having financial-access issues and not being able to afford indirect costs related to going to deliver in a health facility. This is especially true in parts of western Kenya and in certain pastoralist communities where cultural norms and customs continue to encourage women to deliver at home. These settings also point towards the continued use of unskilled birth attendants such as traditional birth attendants to oversee deliveries despite the healthcare system not recognizing or acknowledging their activity (Mason et al., 2015; Karanja et al., 2018; Naanyu et al., 2018). These studies highlight the need for rigorous evidence on the impacts of the interventions being put in place to increase facility-based delivery within the Kenyan context. They also call for different types of studies that might provide further information on what women's preferences are when choosing.

As was pointed out in Chapter 1, understanding the factors underlying access to quality maternity care can provide information that is crucial towards strengthening the maternal health systems and reducing maternal mortality. Mustafa and Moyer (2013) mentioned that most previous studies examining facility-based delivery did not focus on utilizing policy levers influential in affecting such delivery in research. Thus, they called for further research that is policy-focused and can be critical towards understanding women's choices regarding facility-based delivery (Moyer and Mustafa, 2013). Such research can be planned using the methodology of Discrete Choice Experiments (DCE) because they are increasingly being used in health economics due to their ability to value both health outcomes and non-health outcomes, including process outcomes such as waiting time, staff attitudes, etc. (Soekhai et al., 2019). The DCE methodology also allows the assessment of the relative importance or priorities of these attributes as well as for newly formed newly implemented health policies such as the free maternity services.

Understanding demand side barriers to facility-based delivery will eventually lead to better strategies aimed at reducing maternal and newborn mortality in Kenya and improving health outcomes for women. The findings will be useful to policy makers and program managers, allowing them to gain a deeper understanding of what women value and the different factors that influence decision making about place of delivery as well as obtain a deeper understanding on the acceptability of the quality of services received at a health facility. This will be critical because this subsequently influences the choice of health facility delivery. This decision has a large impact of health policies such as the relatively recent free maternity services and universal health coverage hence it is important to incorporate theories that explain both women's behaviors in terms of facilitators and barriers as well as an economic assessment of what they value and their assessment based on their own experiences of the quality of care they receive at health facilities.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section describes the research methodologies employed to conduct the study in the two settings. Section 3.2 provides a summary of the research design, including a justification as to why the design was selected. Section 3.3 includes a description of how the study undertook ethical considerations. Section 3.4 provides details on the setting where the study was conducted. This is followed by section 3.5 that provides the details of the qualitative study including the recruitment of study population, the data collection and analysis. Section 3.6 provides details on how the quantitative study was done including the study population, a description of the instruments used, data collection and analysis. Section 3.7 provides a summary how validity was ensured in the study.

3.2 Research Design

The study's overall design adopted a sequential, mixed-method exploratory approach. This framework embodies an initial process of qualitative data gathering and analysis followed by quantitative data collection and analysis (Creswell, 2014). The qualitative study was important in identifying factors that influence the choices for place of delivery in the two settings by exploring women's lived experiences and perceptions. The factors were identified were used to inform the formation of attributes for a discrete choice experiment. This was followed by a quantitative survey that identified the sociodemographic characteristics and health systems utilization variables. Lastly, a DCE was conducted to elicit women's preferences for place of delivery.

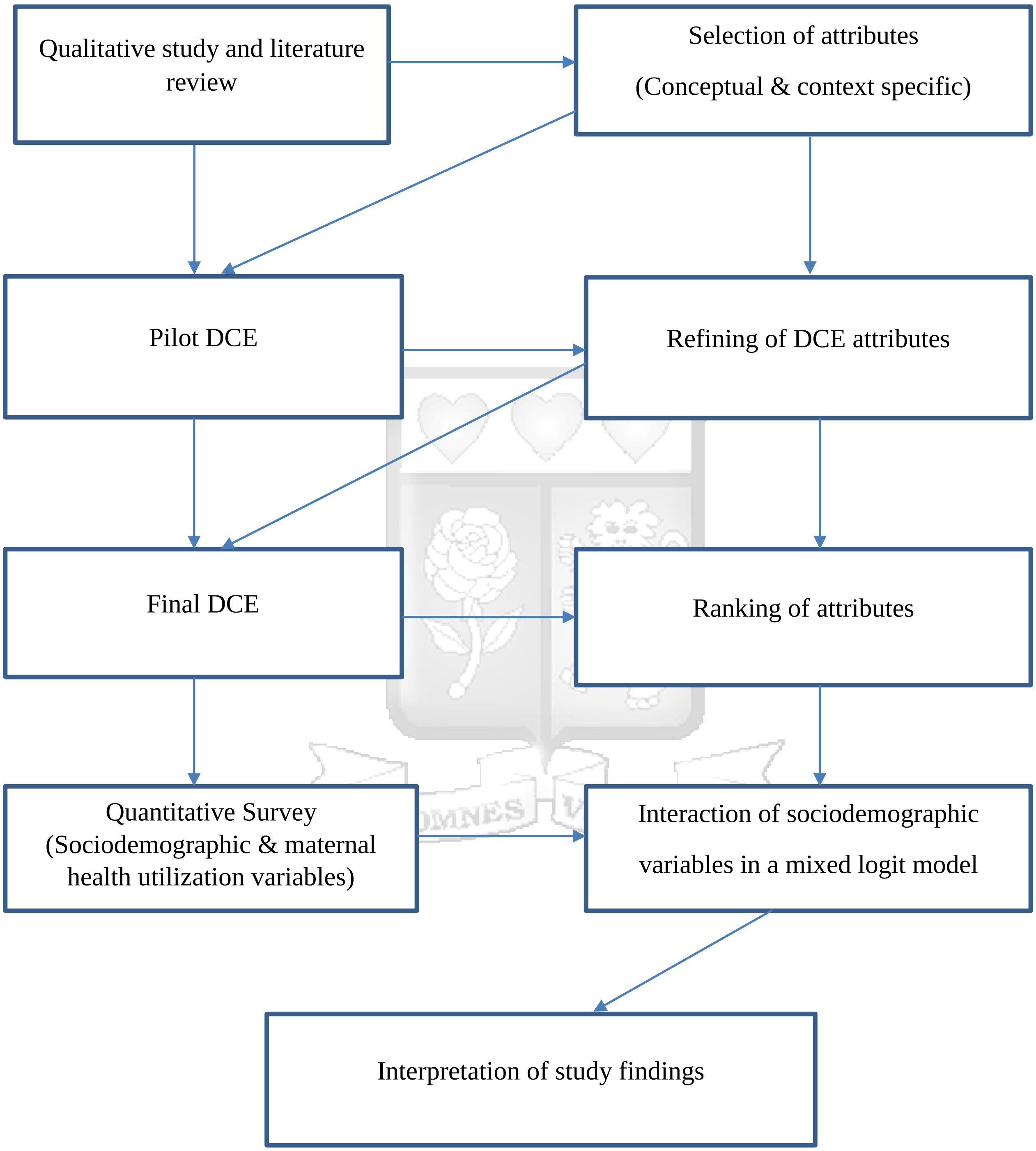

Figure 3.1: Study Methods

3.3 Ethical Considerations

Ethical approval for this research was obtained from the African Medical Relief (AMREF) Institutional Review Board for the Embakasi-North portion of the study and the Strathmore University Institutional Review Board for the Naivasha portion of the study. Additional permission to conduct the research was obtained from the National Commission on Science and Technology (NACOSTI). Written consent forms for all interviews were provided to the study participants. Samples of informed consent forms and all ethical approvals are included in the Appendices.

3.4 Study Setting

The study was conducted in two settings. The first was Embakasi-North sub-County in Nairobi County, a peri-urban settlement approximately 7km from Nairobi's city centre (Figure 3.2). It constitutes four Dandora administrative wards together with Kariobangi-North Ward. Embakasi-North has a population of approximately 200,000 people. (Kenya National Bureau of Statistics, 2019). The health system in Embakasi-North consists of several government primary health centers such as Dandora Health Centre I, Dandora Health Centre II, Njiru Health Centre, and Kariobangi North Dispensary. There are also several private health facilities, such as Samaritan Medical Services, Paradise, Mkunga, Provide International, and Brother Andre Medical Centre. The main referral health facility for maternity cases in this sub- county is Mama Lucy Maternity Hospital, located in the neighboring Embakasi-West Sub-County approximately 5km away from Embakasi-North.

The second was Naivasha Sub-County, in Nakuru County. It is a semi-rural setting 50km to the northwest of Nairobi (Figure 3.3). It is composed of peri-urban settlements, and includes agriculturalist and pastoralist populations within Nakuru County. It has a population of roughly 181,966 people. (Kenya National Bureau of Statistics, 2019). The Primary Health facilities include government health facilities such as Wangu Dispensary and Karagita, Mai Mahiu, and Nyamathi health centers; several private health facilities; and Naivasha County Referral Hospital in Naivasha town. The population is also served by a faith-based private hospital, Africa Inland Church (AIC), and Kijabe Mission Hospital is about 20 km away from Naivasha in neighboring Kiambu County.

Both Embakasi- North and Naivasha sub-counties were purposely selected for this study because of the persistence of high rates of maternal deaths within the county. A United Nations

Fund for Population Agency (UNFPA) report identified fourteen counties as contributing to most of all maternal deaths in Kenya, with Nairobi and Nakuru counties ranked 3rd and 4th, respectively, in terms of high maternal mortality (UNFPA, 2014). Peri-urban settings such as Embakasi-North have been known to have high maternal mortality rates, with a previous study estimating maternal deaths at two informal settlements bordering Embakasi-North at 700 per every 100,000 live births (Ziraba et al., 2009).

Additionally, the most recent Kenya Demographic and Health Survey (KDHS) report provides details about inequities in facility-based delivery in Kenya, with 42% of women residing in rural areas delivering in a health facility as compared to the 70% for urban areas (KDHS, 2014). Further inequalities are also seen in wealth quintiles. Only 30% of women in the lowest wealth quintile delivered in a health facility (KDHS, 2014). Naivasha sub-County represents parts of Kenya that have significantly at-risk populations of pastoralists, rural agrarians, and residents of informal settlements who live next to commercial flower farms.

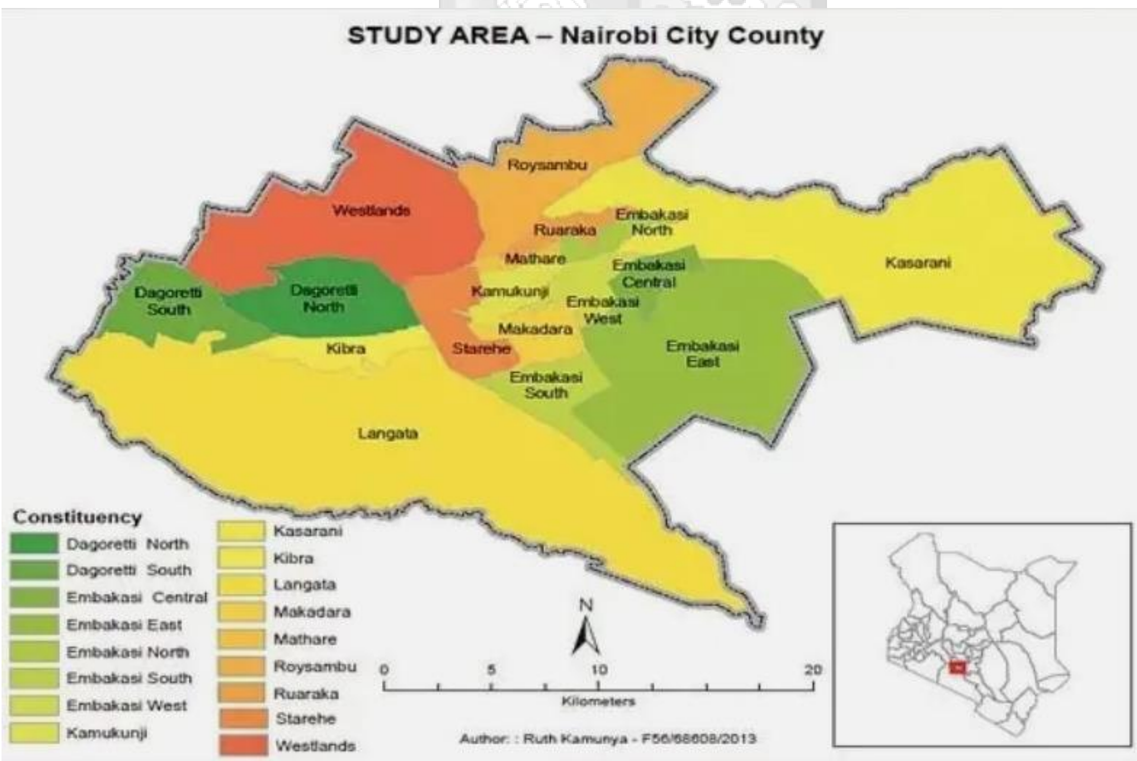

Figure 3.2: Map of Nairobi County Source: (Kwach, 2018)

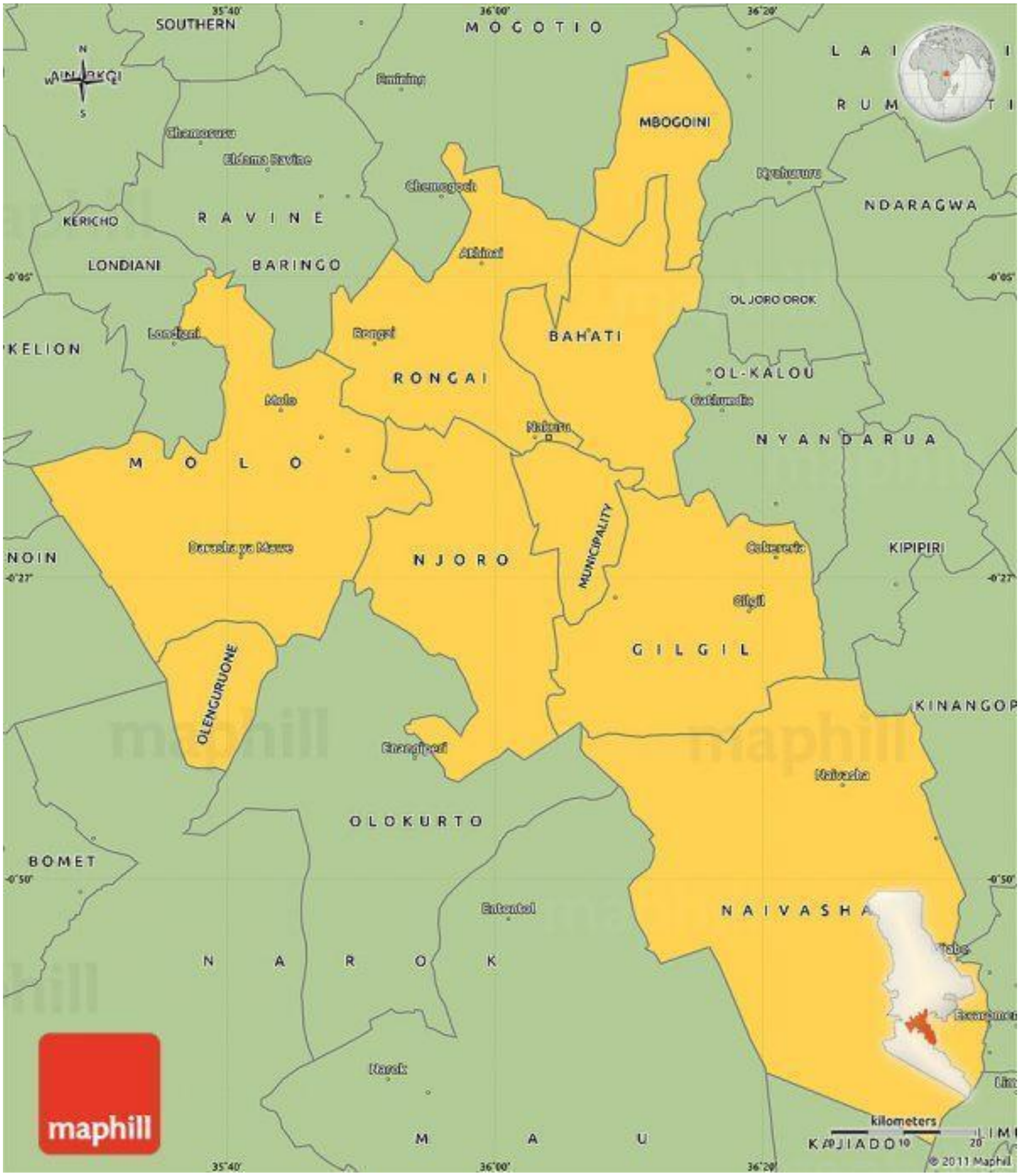

Figure 3.3: Map of Nakuru County showing Naivasha sub-County. Source: (Wildmart, 2018)

3.5 The Qualitative Study

The first phase of the research involved a qualitative study aimed at defining factors that affect women's choice about the place of delivery. This was accomplished through focus group discussions (FGDs) with women attending immunization clinics and in-depth interviews with healthcare providers in charge of maternities at health facilities. The qualitative established factors that influence women’s choice of place of delivery through their exploring their experiences and perceptions of their delivery. This was done in preparation for the latter stages of the research that would constitute a discrete choice experiment (DCE), involving qualitative studies to assist in the design of the DCE survey through the identification of attributes and establishment of attribute levels (Coast, 2012). Healthcare workers serving in maternity settings engaged in in-depth interviews to gain a better understanding of the healthcare system's viewpoint. Healthcare workers who had served within a maternity setting for the past five years were selected for inclusion into the study.

3.5.1 Qualitative Study Population

FGD participants were recruited through purposive sampling, using maximum variation sampling methodology. This included sampling respondents from a mix of mission, private, and public health facilities. To identify appropriate participants, maternal healthcare providers at the facilities were utilized. The participants signed an informed consent document (**Appendix A**) before participating in the study. Inclusion criteria included both women who resided close and far from the facility whose most recent birth occurred 12 months preceding the survey. The exclusion criteria were women who had had babies more than 12 months at the time of the study. Women were recruited from immunization clinics at two public, two private, and two mission health facilities for a total of six health facilities in each settings. Potential study participants were informed by service providers in the waiting areas of immunization clinics. After meeting the recruitment criteria, the participants were led to a private location for focus group discussions. Privacy and confidentiality was maintained. An FGD guide (**Appendix B**) was used to guide the interviews. The FGDs had between six and eight participants each.

Health care workers were recruited purposively from their duty stations at the health facilities. The health care workers signed an informed consent document **(Appendix A)** that allowed the study investigator to interview them. The recruitment criteria was health care workers who had served in a maternity ward for a minimum of five years or more. The exclusion criteria was health care workers who had not worked in any capacity at a maternity in a hospital setting. A total of twelve health care workers were recruited two from each category of health facilities from six health facilities. An in-depth interview guide (**Appendix B**) was used to facilitate the interviews

3.5.2 Qualitative Data Collection

Discussions of focus groups and in-depth interviews is based on an FGD /in-depth interview guide (**Appendix B**). Interviews with the Embakasi-North took place in Swahili, the local Kenyan language for both sub-county locations. Written consent was obtained from all the women in the focus group discussions. In Embakasi-North, the FGDs and interviews were held in public health facilities such as Dandora Health Centre I & II and the referral health facilities of Mama Lucy Hospital, and in private health facilities such as Mkunga, Provide International, Samaritan, and Brother Andre Medical Centre.

In Naivasha County, both *kikuyu* and *maasai* languages were used, since a majority of the women came from both *kikuyu* and *maasai* ethnic communities. Trained local research assistants from Kijabe Hospital who spoke the various languages were engaged to assist with interpretations of key concepts. In Naivasha, verbal consent was obtained because of the literacy levels of the women. This was in accordance with the institutional review board submitted consent forms. The interviews were translated and transcribed with a focus on semantic meaning. In Naivasha, healthcare personnel who were native speakers of either *kikuyu* or *maasai* reviewed all transcripts to ensure the translations appropriately captured semantic meaning. The interviews were recorded using a tape recorder for transcription and translation facilitation. The interviews in Naivasha were conducted at Karagita Health Centre, Wangu Dispensary, Mai Mahiu Health Centre, Nyamathi Dispensary, the Naivasha County Referral Hospital, Kijabe Naivasha Medical Centre (NMC), and the referral facilities of AIC Kijabe Hospital.

3.5.3 Qualitative Data Analysis

The data was organized and managed by *Nvivo 11* software (Version 11, QSR International) qualitative data analysis was done using thematic analysis. The thematic analysis was done and followed Braune and Clark’s six steps of data analysis. These steps include 1) familiarization with the data, 2) generation of initial codes across the data set, 3) grouping coded data and 4) searching for themes by gathering data that are relevant to each themes, 5) reviewing themes defining and naming the themes identified and 6) producing an analysis report and selecting appropriate and vivid quotes in support of the themes identified (Braun and Clark, 2006). The data analysis began with an independent reading of all transcripts for familiarization with the data. The data was read iteratively multiple times and notes made in all the margins. A coding scheme was established based on the interview guide and was used for deductive line-by-line manual coding of the transcripts **(Appendix C).** One of the supervisors reviewed all thematic coding for consistency with the literature and coherence in the application of coding scheme themes. A comparison of a subset of transcripts from both settings was done to ensure that the coding inter rater reliability. The codes used were found to be applied in a similar and consistent manner. New codes and categories were also allowed to emerge inductively from the data. Agreement between coders was nearly complete, but differences, when identified, were discussed and resolved. Thematic analysis was used to identify important themes that emerged from the study, and then the themes were compared to Bohren et al.'s (2014) conceptual framework on factors affecting facility-based delivery. (See Figure 2.2).

3.6 The Quantitative Study

The second phase was a quantitative study that utilized a stated preference methodology called a discrete choice experiment (DCE) with a survey that was aimed at providing hypothetical questions regarding characteristics related to women's preferences for choice of place of delivery. A quantitative survey was also administered to provide information on sociodemographic and maternal health variables that were important in understanding how women's preferences vary with changing personal characteristics and health system utilization patterns.

3.6.1 Quantitative Study population

The inclusion criteria for the quantitative survey was women of reproductive age (18-49 years) who at the time of the survey had delivered in the past twelve months. In the rural setting, women were recruited from immunization clinic care services at the purposively selected health facilities. They were identified from the health register by the health worker in charge. Trained enumerator's generated random numbers from Microsoft Excel and assigned them to the names on the register; thus determining which women were invited to participate in the survey.

In the peri-urban setting, the survey was conducted at the household level as part of a larger baseline survey for a study on women's health. All participants in both settings gave written consent forms before trained enumerators administered the questionnaire (**Appendix D**). The household survey tool was a composite that was based on the Kenya Demographic Health Survey (KDHS) 2014 (Kenya National Bureau of Statistics et al., 2015) and the African Population and Health Research Centers APHRC slum survey (APHRC, 2012).

The random selection of women in the survey was done by mapping out the Dandora area and generating 200 points on the geographic positioning system (GPS) from google earth. (**Appendix E**) After this a list of randomly generated numbers was created using Microsoft excel and matched to the 200 points in the map. Starting from a selected point the enumerators were instructed to approach the households identified using the random numbers on the list.

The key indicator to be estimated (p) is the prevalence of facility-based delivery. This figure was obtained from the Kenya Demographic health survey to be 61%. (Kenya National Bureau of Statistics et al., 2015). The critical value for the standard normal distribution corresponding to a type 1 error rate of α was estimated at 1.96. The design effect that was used was similar to that used in the Slum Survey at 1.5. The sample size calculation for the main survey was done using a formula based on the one used by the Slum Survey 2012 (APHRC, 2012) as shown below;

N= the required sample size of the individuals in the target population

p= the expected rate or prevalence of the key indicator to be estimated.

e =Deff (design effect)

α = margin of error to be tolerated at 95 % level of confidence

z = critical value for the standard normal distribution corresponding to a type 1 error rate of α

Source. (APHRC, 2012)

(Equation 3.1)

$$N = \frac{z^2 (1-\alpha/2) * p (1-p)}{e^2}$$

$$N = \frac{1.96^2(1- 0.475)*0.61(1-0.61)}{1.5}$$

$$= 319$$

The total sample size calculated for the Naivasha sub-County site was 319. This was sufficient to estimate the effect. An additional estimated 20% more women were added to account for possible incomplete surveys and mistakes in answering the DCE survey. The final sample size for Naivasha sub-county was 474 women sampled from six health facilities. The women were recruited from health facilities during immunization clinics and were randomly sampled using a random number generator

For the Embakasi- North site the household survey was administered to a total of 4640 randomly selected women. Then we used the criteria for the selection of the women for the DCE's- this criterion was women who delivered within one year of survey time. For the DCE a small proportion of roughly 10% of women who met the criteria of having delivered within one year and those who were aged between 18-49 years were selected to select the 481 women from the 4640 women.

3.6.2 Quantitative Data Collection

The Quantitative survey was undertaken in Naivasha and Embakasi North sub-counties in August and September 2018. It was administered in Kiswahili through a face-to-face interview by a team of six trained local interviewers who had undergone a week of training, including a full day of training. The data collection was done on the Open Data Kit (ODK) software platform. The sampling frame for both sites came from women receiving health services within the catchment areas of the health centers and tertiary hospitals that are part of this study.

The maternal health utilization survey instrument (**Appendix D**) was translated into Swahili, the local language, and back translated to English to ensure meaning was maintained. The survey questions were read aloud to participants by trained research team members who recorded responses electronically on a tablet. The quantitative survey had questions that were organized into two main domains. The first domain had items on sociodemographic and household variables, such as age, education, marital status, parity, residence, main earner status. The items also included household characteristics such as head of household status, head of household education, head of household employment and household assets. The second domain was focused on reproduction and pregnancy and had items that covered the pregnancy experience, place of delivery, number of pregnancies, number of live births, number of stillbirths, deaths, or miscarriages, whether working during ANC experience, obstetric complications, and presence of skilled birth attendants, birth outcomes and health insurance. These questions were developed as closed questions that were followed by a list of possible answers. Some of the questions were also questions with yes and no answers. The questions were grouped together by topic. The first part was questions on sociodemographic and household variables. The second part was questions related to reproduction and pregnancy. The final questionnaire was composed of 84 questions that consisted of 7 sociodemographic items, 24 household items and 51 items on reproduction and pregnancy **(Appendix D)**

DCEs belong to a family of techniques called conjoint analysis, which is a systematic method for determining preferences used to evaluate the defined preferences. The experiments have been increasingly used to value health interventions i n health economics (Ryan, 2008). They were also used to gain declared preferences for new treatments (Hauber et al., 2016). DCEs have been used more recently to evoke patient expectations for health status. (Bridges et al., 2011). DCEs are a technique focused on the attributes used to obtain specified preferences and interventions (Louviere & Flynn, 2010) and are based on the assumption that healthcare interventions, services, and policies can be described by their attributes (de Bekker-Grob, Ryan, & Gerard, 2012 ; M. Ryan & Watson, 2009). The advantage of DCEs over other methods of economic evaluation is that they permit estimation of a range of healthcare elements, including structural components, process components, health outcomes and non-health outcomes, make it useful to understand the value of healthcare consumers (M. Ryan & Gerard, 2003). The attributes of the interventions and their assigned rates are typically combined using experimental designs which yield a collection of alternatives to hypothetical choices. Respondents are then asked to select the alternatives they prefer; the degree of attributes dictates the usefulness respondents assign to a specific feature of an intervention and thus their preferences (M. Ryan, 2004 ; de Bekker-Grob et al., 2012). The DCE experimental design was done by identifying attributes & attribute levels. Possible attributes that have been identified in sub-Saharan contexts with regard to preferences for place of delivery for women include: cost, distance, transport, type of provider, attitude of provider, drugs, and equipment (Kruk et al., 2009; Kruk et al 2010; Larson, 2015). After the qualitative data analysis, the selected attributes were assigned levels (Hall et al., 2002).

Table 3.1: Attributes and attribute levels identified in Naivasha and Embakasi-North sub County

Naivasha Sub-County		**Embakasi-North Sub-County**	
Attribute	**Attribute level**	**Attribute**	**Attribute level**
Quality of clinical care	Good-quality of care services	Quality of care services	Good-quality services
	Bad-quality services		Bad-quality services
Attitude of healthcare worker	Kind and supportive healthcare worker	Attitude of healthcare worker	Kind and supportive healthcare worker
	Unkind & unsupportive healthcare workers		Unkind & unsupportive healthcare workers
Availability of drugs and equipment	Drugs and equipment available	Availability of drugs and equipment	Drugs and equipment available
	Drugs and equipment not available		Drugs and equipment not available
Distance to health facility	Health facility is close	Distance to health facility	Health facility is close
	Health facility is far		Health facility is far

Referral services	Referral services available	Cleanliness of health facility	Clean Health facility
	Referral services not available		Dirty health facility
Cost of delivery	3000Ksh	Cost of delivery	3000Ksh
	5000Ksh		5000Ksh
	8000Ksh		8000Ksh

The sample size for the surveys was determined by a rule by Johnson and Orme (2003). The rule suggests that the sample size needed for main effects depends on the number of tasks to choose from (t), the number of alternatives (a) and the number of cells to evaluate (c). When considering all two-way interactions, the formula considers main effects C is equal to the maximum number of rates for any of the attributes. For this study, anticipated two way interactions was anticipated, hence the largest level size 3 was multiplied by 2 to give 6. There were 16 Choice tasks (t) with 3 alternatives (a) and 3*2 analysis cells (c). The formula by Johnson and Orme (2003) was then used to calculate the sample size, N> 500*c/t*a =N>=62.5 as the calculated sample size A pilot DCE with 30 respondents was conducted to be able to establish beliefs about the parameter estimates for the DCE, enabling prediction of their movement when the main DCE was held. The survey was then pre-tested in a nearby Embakasi-West sub-county that was not part of the study to ensure that the questions were understandable.

Hypothetical alternatives were generated and combined to create choice sets (de Bekker-Grob et al., 2012; Lancsar & Louviere, 2008). A fractional factorial design was utilized for this experiment to reduce complexity (Mangham, 2009). Five attributes were dichotomous, and only the cost attribute had three levels, resulting in ($2^5 \times 3^1 = 96$) possible health-facility choices in the full factorial design. A fractional factorial design that reduced the choices to 16 choice-sets was used to lower the complexity of the questionnaire for the respondents. (See Figure 3.3 for a sample of the choice-set questionnaire.) The final design employed a D-efficient design using JMP Software (SAS) to derive an efficient design Kuhfeld (2005). (**Appendix F).** All the attributes were dummy-coded to allow comparison against a reference category. The D-efficient design also allowed for favorable design elements such as orthogonality, level balance, minimum balance and overlap to be ensured (Huber & Zwerina, 1996). The Bayesian design was not used because it assumes a prior distribution of likely parameter values and optimizes the design over that distribution. The parameter values obtained from the pilot were from a very small sample size and was deemed unstable (Sandor and Wendel, 2001).

The DCE survey used an information packet (**Appendix G**). Using the packet, women were about hypothetical scenarios in which they indicated a preference for one of two health facilities (A or B) based on their characteristics. An opt-out option was included if the woman preferred neither of the two presented options. The choice-set survey was done together with the quantitative survey. The experiment was unlabeled and had a three-choice set with three alternatives: health facilities A and B and a third opt-out option for neither of the two.

In summary the DCE involves identifying attributes from both the conceptual literature and contextual attributes from the qualitative study. A quantitative component that utilized an experimental design is piloted and then subsequent data collection and data analysis is done. The schematic representation of the main phases of the specific methodology of DCE are shown in Figure 3.4.

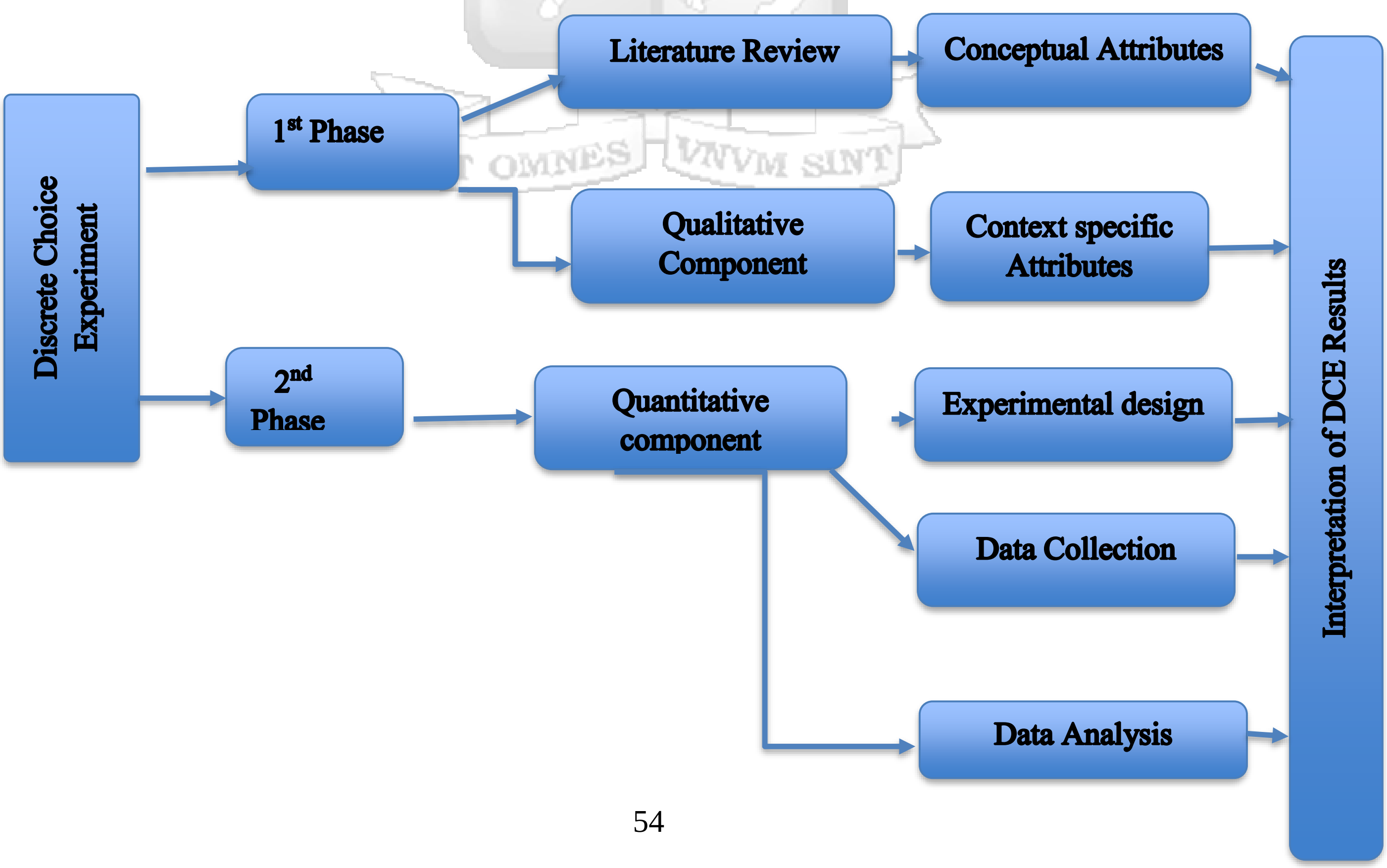

Figure 3.4: DCE flow - Adapted from a conceptual framework by (Abiiro, 2014)

Since the DCE was a hypothetical experiment, the women were asked to imagine that they were expecting a baby and had to choose a health facility in which to deliver their babies. Their choice was between health facilities A and B with certain attributes, which were explained to them (Table 3.1: Attributes and attribute levels identified in rural and peri-urban sub County respectively). The respondents were also given an option to opt out and not choose either. They were told that an opt-out also implied neither of the two facility choices and hence a preference for a home delivery. Finally, they asked the respondents there were no incorrect or right answers, and they were free to stop the experiment at any time. The data was entered on a "real-time" basis using Android smartphones with Open Data Kit software (ODK). The electronic data entry has the advantage of reducing risks of errors in recording the answers and eliminating the need for double data entry from paper to software transcription. The pictorial presentation of the DCE attributes and attribute levels is shown in Table 3.2: Digital representation of the choice-sets that was uploaded on ODK platform

Table 3.2: Digital representation of the choice-sets that was uploaded on ODK platform

	Clinic A	**Clinic B**
Treatment at health facility	Bad	Good
Distance to facility	Long/Far	Short or Near
Attitude of Health worker	Unkind/Not Supportive	Unkind/Not Supportive
Medical equipment & Drugs	Always available	Not Available
Referral services	Availabe	Not Available
Cost	5000	3000

3.6.3 Quantitative Data Analysis

Summary descriptive statistics were analyzed for the sociodemographic and household and maternal health utilization variables using STATA 15. These variables were then used in encounters to test a mixed logit how individual factors and perceptions of the health system affect the reported desires of women.

The results of the DCE were analyzed according to a Random Utility model (McFadden, 1974). The random utility model expresses U in an alternative i in a set of choices C_n (perceived by individual n) as two parts:

1) An explainable component specified as a function of the attributes of the alternatives $V(X_{in}, \beta)$; and 2) an unexplainable component (random variation) ε_{in}.

$$U_{in} = V(X_{in}, \beta) + \varepsilon_{in} \quad \textit{(Equation 3.2)}$$

U_{in} is the true but unobservable utility for alternative I by an individual n

V is the observable systematic component of utility defined by the attribute levels for the alternative i

X_i is a vector of attribute levels defining alternative i

β is a vector of estimated coefficients

ε_i is the random error component

In a choice set C, the individual n will choose alternative i over other alternatives if and only if this alternative gives maximized utility. Under a linear-in-parameter function, the utility function relationship and the observed k attributes of the alternatives can be assumed (Louviere 2010). Therefore, the utility the respondents attach is related to the attribute and attribute levels within the choice-sets; hence, if alternative i is chosen within a choice set, i will yield the maximum utility over j alternatives. α is the alternative specific constant, x is the attributes in the DCE, and β is the coefficients describing the marginal utility of the attribute. The standard conditional logit model is shown below:

$$V_{in} = \alpha_i + \beta_i x_{i1} + \ldots + \beta_k x_{ik} \quad \textit{(Equation 3.3)}$$

V_{in} is the true but unobservable utility for alternative I by an individual n

α_i is the alternative specific constant

$\beta_i x_i$ is the vector of estimated coefficients for individual x_i

The RUF assumes that the individual n maximizes utility and chooses the alternative, which constitutes the highest level of utility. The true utility function cannot be observed, and so a probabilistic utility function (indirect) is used in the estimation. The probability that a sampled individual n will choose alternative I (described by attributes Xn equals the probability that the difference between the random utility of any other alternative j and the chosen alternative i is less than on the difference between the systematic utility levels of alternative b and j for all J alternatives in the Choice Set Cn.

The conditional multinomial logit model. A base conditional model was fitted to estimate the mean change in utility, the preference that the respondent placed on attributes. Using the utility framework, there is an assumption that women will make trade-offs between the different attribute levels and choose the alternative that gives the greatest utility. The conditional model is suitable for estimating average preferences (Louviere, 2010). The utility function equation that was estimated for the conditional model for the rural and peri-urban setting is presented below:

*U_i= β0 (opt-out) + β1 (good quality of clinical care of services) + β2 (kind attitude of health workers) + β3 (availability of equipment and supplies) + β4 (short distance) + β5 (availability of referral services + β6 (cleanliness of health facility) * +Cost (Equation 3.4)*

* The last two attribute levels were interchangeable in the two sites. Availability/unavailability of referral services was identified in the rural setting whereas the clean/dirty health facility was identified in the rural health facility

β_0 is the parameter for the Alternative Specific Component / opt-out;

β 1-12 are the parameters for each of the attribute levels and ε is the error term.

The cost of delivery services is explained as the out of pocket costs including informal costs that women are charged. The free maternity service does not include costs for drugs and other complications and prolonged stays at the health facility. The cost has been revised to indicate more details about what cost entails.

Since DCEs use qualitative outcomes, dummy dependent variables can be used to estimate the probability that the outcome y=1 occurs. It is not possible to use ordinary least squares (OLS) because it would result in an error term that is heteroskedastic and is not normally distributed. In addition, the predicted probabilities are not guaranteed to be within the 0, 1 interval, and the predicted values of the dependent value can be beyond 0 and 1, which violates the definition of probability. Therefore, probit and logit functions that are nonlinearly related to the independent variable will be used for the data analysis. In a logit model, the logistic cumulative density function (CDF) replaces the linear function so that you can estimate probabilities. The β terms are estimated using the maximum likelihood method. Parameter estimates for the different utilities inputs into the model will be compared to see which ones have the highest value and hence represent the preference for a specific health facility in the choice model.

The Mixed Multinomial logit model. The data collected on place of delivery is likely to have more than two choices in a choice set, and hence we used the multinomial logit model (MNL) to analyze the multinomial choice. The MNL model is derived under the assumption that the disturbances ε_{in} are independent and identically distributed (IID) extreme value type I (Gumbel) with mode zero and variance $\mu^2 \pi^2$

/6 where μ is a positive scale parameter (Hensher 2015). The individual choice probability is then given by;

$$P_{in} = \frac{\exp(\mu V_{in})}{\sum_{j \in C_n} \exp(\mu V_{jn})} \qquad (Equation\ 3.5)$$

The assumption of independent errors leads to the independence of irrelevant alternatives (IIA) property. This behavioral assumption states that for a given individual, the ratio of the choice probabilities of any two alternatives is unaffected by other alternatives. The initial conditional logit model assumed homogeneous preferences across respondents, therefore due to the assumption of the presence of heterogeneity, we also estimated a mixed logit model to assess for preference heterogeneity amongst the women. This was done by extending the generalized model and testing interactions between the sociodemographic and the women's attributes. In the first stage of data analysis, the base multinomial logit model was estimated using only design attributes as the explanatory variables. A second mixed logit model was run that included interactions between the characteristics of the women and the attributes in order to investigate how preferences may vary according to observed individual characteristics. The sociodemographic characteristics that were included as interaction terms include: the age of the women, marital status, education of the women, and main earner status. These variables had been earlier identified through the literature review as factors that influence place of delivery.

The model was subjected the mixed multinomial logit to 50 halton draws to pre-test its stability. Once the iterations of log-likelihood were stable we subjected the mixed multinomial logit regression to 500 halon draws. The output of the conditional logit model contains the beta, which shows the magnitude of the preferences for the attribute. The output of the mixed multinomial logit model which includes both the mean and the standard deviation of the random parameter estimates with confidence levels. The mean parameter estimate represents the relative utility of each attribute while the standard deviations reflect the preference heterogeneity amongst respondents.

Hypothesis testing. The null hypothesis states that the parameter estimates for the established attributes of the place of delivery that influence women's decision on where to deliver their babies are not statistically significantly different from zero. The alternate hypothesis states that the parameter estimates for the established attributes of the place of delivery that influence women's decisions on where to deliver their babies is statistically significantly different from zero. The study hypotheses aim to establish the strength of preference for relative importance of and trade-offs amongst the above named attributes, for instance, if distance is more important than cost or if the attitude of the healthcare provider is more important than the distance in each of the contexts.

The model fit was assessed using a log likelihood ratio (LLR) test. The inclusion of sociodemographic profiles of respondents makes it possible to determine how individual characteristics influence choices for health facility characteristics (Lancsar & Louviere, 2008).

Assessing trade-offs and willingness to pay (WTP). The women's trade-offs by calculating the Marginal Rate of Substitution (MRS). This is the ratio of two estimated coefficients that represents a person's willingness to give up one attribute in order to achieve more of another attribute. The estimation of the WTP is based on a calculation of the marginal rates of substitution based on the ratio of the attributes and the cost attribute. (Ryan, Karen, &Amaya-Amaya, 2008). For example, a cheaper health facility delivery cost for certain qualities that might be highly valued such as quality of service or cleanliness. When a cost variable is included, willingness-to-pay estimations can be calculated (Johnson et al., 2011). This was then modelled using STATA software (2015).

3.7 Validity and Reliability of the Research Study

The validity of the qualitative study was assessed used by independent researchers conducting the coding. A coding scheme was developed from the FGD guides and using conceptual frameworks from the literature on facility-based delivery. During the process of data analysis, the main author met with the member of the research team with extensive qualitative and clinical experience to discuss the emerging codes and categories as well as the interpretation of the emerging themes, hence combining insights.

The validity of the quantitative survey was assessed by checking on the content validity that pertains to the degree to which the instrument fully assesses or measures the construct of interest. This was done by using instruments adapted from the Kenya Demographic Health Survey (2014) (Kenya National Bureau of Statistics et al., 2015) and the Nairobi Cross Sectional Slum Survey (APHRC, 2012)

The validity of the DCE was done by ensuring that there was choice consistency. We followed the definition of choice consistency provided by Carlsson, Morkbak and Olsen (2012) who define choice consistency as 'making the same choice in two equal choice tasks'. We included a question regarding choice certainty after each choice task which asked the respondents "How certain are you about this choice?" There were five answer options" Not certain, slightly certain, moderately certain, certain and very certain". We also tested for choice monotonicity, this is the assumption that a respondent will choose an alternative in the choice task that is superior to the other alternative on all choice attributes see (De Bekker-Grob Ryan and Gerard 2012; Lancsar and Louviere 2006). We included a choice-task with dominated alternatives within the choice-sets. We included these responses in the analysis because Lancsar and Louviere (2006) noted that such respondents with dominant choices should not be deleted. This is because deleting them may result in the removal of valid preferences and hence reduce statistical efficiency and result in sample selection bias. They also go on to advice that even if such respondents are not making trade-offs and the marginal rates of substitution cannot be estimated these preferences are still important from a policy perspective (Lancsar and Louviere, 2006).Correlation coefficients were compared between the different choice alternatives of health facilities to establish the preference for health facilities.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter lays out the study's research findings. Section 4.2. Presents findings from the qualitative study that established the factors that influence choice of a place for delivery. Section 4.2. presents the findings from the results of the pilot Discrete Choice (DCE) that refined the selected attributes. Section 4.3 presents the results of the final DCE survey which sought to elicit women's preferences for place of delivery. Section 4.4. presents the results of the quantitative survey, which collected information on the sociodemographic characteristics of the women in the study and their maternal health services utilization behavior and interacted them to establish how preferences vary with personal characteristics. It also established the trade-offs women made when selecting the attributes and their willingness-to-pay estimates. Finally, section 4.5. presents a summary of the findings.

4.2 The Qualitative Study

The qualitative study findings address research question one that seeks to establish the factors that influence women's choices of place of delivery. The question was addressed through interviewing women and health care workers and assessing their experiences and perceptions regarding place of delivery. The following subsections provide a brief description of the characteristics of the women and health care workers interviewed in both settings as well as thematic analysis that was conducted to identify the main themes. The themes were organized according to theoretical frameworks identified in the literature review as summarized in figure 2.1 in Chapter two. New sub-themes that emerged are also presented.

4.2.1. Characteristics of the Focus Group Discussions (FGD) Participants

A total of 100 people (50 at each site) were approached, 92 people participated in the focus group discussions (FGDs). Among these, 40 were living in peri-urban areas and the remainder were living in rural areas. Furthermore, there were interviews with 12 workers employed in maternity departments at health facilities (six each for sub-counties Embakasi-North and Naivasha, respectively). The key characteristics of the women who participated in the study are summarized in Table 4.1. With a mean age of 22 years, the women in the peri-urban setting were relatively younger compared to those in rural settings, whose mean age was 26 years. The participants in both FGDs had an average of 3 children each, with an average age of 2 months. A majority of the respondents in both FGDs had attained primary level of education. The healthcare staff's work experience ranged from five to ten years.

Table 4.1: Characteristics of Focus Group Discussion participants

Variable	Embakasi-North	Naivasha
Age (Years): mean (SD)	22(6.6)	26 (0.5)
Age of children-months (SD)	1.7 (0.5)	2.1 (3.0)
Parity N (%)		
Primiparous	14 (35)	12 (23)
Multiparous	26 (65)	40 (77)
Delivery facility N (%)		
Public level 4 sub-County health facility	9 (22.5)	7 (14)
Public level 2 and 3 primary health facility	10 (25)	30 (58)
Mission health facility	9 (23)	8 (15)
Private facility	12 (30)	7 (13)
Total (%)	**40 (43)**	**52 (57)**

4.2.2 Qualitative Study Themes

The thematic analysis followed an approach by Braune and Clark (2006) and was assessed using Bohren et al.'s (2014) conceptual framework, which identifies four main themes that showcase facilitators and barriers for women in their choice of place of delivery. The four themes identified under this conceptual framework are: (1) perceptions of quality of care, (2) resource availability and access, (3) influence of sociocultural context and care experiences and (4) perceptions of pregnancy and delivery. Three out of the four themes were identified in the FGDs and in-depth interviews that were conducted. The results of the thematic analysis are summarized in *Table 4.2:*

Table 4.2: Summary of factors influencing the place of delivery in Embakasi-North and Naivasha sub-Counties

Themes	Factors	Embakasi-North	Naivasha
1.Perceptions of quality of delivery care at the health facility	Availability of medical equipment and supplies.	Public tertiary health facilities were preferred for delivery services because of their ability to conduct cesarean sections in the event of an obstetric emergency.	Private low-cost facilities for delivery services were preferred because of perceptions of higher quality and good services;
	Attitude of health care workers at health facility	Manifestations of mistreatment by health worker were verbal abuse and abandonment by night shift nurses particularly at public tertiary hospitals	Manifestation of mistreatment by healthcare workers verbal, physical abuse, and was during the daytime. Staffing shortages were blamed for the mistreatment and less mistreatment was reported at private health facilities
	Interpersonal treatment at the health facility	Respondents reported receiving good interpersonal treatment at the smaller primary public health facilities nearby them	The respondents reported good interpersonal treatment at private hospitals.
	Availability of physical amenities at the health facility -Cleanliness	Respondents reported preference for a clean and hygienic health facility. Most public health facilities been identified as unclean and unhygienic	Respondents did not have any have any concerns regarding the cleanliness of health facilities
	Availability of physical amenities at the health facility -Security of newborns	Respondents did not express any concerns about security at the health facilities	Respondents did not express any concerns about security at the health facilities
Influences of sociocultural context and care experiences	Location of Antenatal care services	Respondents reported discrimination based on the location of ANC attendance. Delivery services were delayed if they had attended ANC at private health facilities and presented themselves for delivery at a public health facility	Respondents reported discrimination based on location of ANC care were described particularly targeted at younger unmarried mothers
	Effect of free maternity services policy.	Most women preferred public hospitals such as the sub-county hospital because it was now free of charge	Some women described using private health facilities despite the free delivery in

		and would cater for their babies even in the event of a complications	public services because of the perceived quality of care
Resource availability and access.	Cost of delivery services	Respondents described preference for public tertiary health facility because of the low costs associated with the delivery but complained about several informal charges	Respondents described preference for private health facilities despite higher costs Some facilities in the informal settlements were not NHIF-accredited. Informal payments were also an issue
	Distance to health facility	Respondents settled for health facilities that were close to their residences:	Respondents had a preference for health facilities that are close their homes and considered the transportation costs
	Access to referral services	Respondents described been referred to the public tertiary sub-county hospital in the nearest town	Respondents described being referred to tertiary public health facilities. However, some chose self-referrals to low-cost private health facilities

The most reported theme from both settings was the perceived quality of care received during delivery at the health facilities. Approximately thirty and forty women in the rural setting respectively identified this theme. This presents approximately 75% and 70 % respectively. Bohren et al. (2014) proposes perceived quality of care from traditional birth attendants (TBAs) and perceived quality of care at health facilities. This study re-categorizes those into three new sub-themes that correspond to facility-based care: (i) availability of physical amenities at the health facility, including medical equipment and supplies. It also addressed sub-themes of the security of newborns, the need for cleanliness at the health facilities as well as the availability of food and hot water as amenities that women mentioned they required at the time of delivery (ii) the interpersonal treatment at the health facility and the attitude of healthcare workers. (iii) availability of referral services.

Under the impact of the sociocultural context and the topic of care experiences, the women reported mostly on the impact of the new free maternity policy that was currently undergoing implementation. The influence of antenatal care (ANC) services was also reported, especially with regard to young first-time mothers; women with previous births made their decisions based on their own experiences or the experiences of others. We introduced a new sub-theme with regard to the 2017 medical workers strike that was ongoing at the time of the study. The ease of home births and the influence of others on place of delivery was not discussed widely in this study's settings.

With regard to the theme on resource availability and access, transportation issues and distance was predominantly mentioned by the women in the rural setting because of the vastness of Naivasha sub-County. The sub-theme of costs, both direct and indirect, was mentioned by women in both settings. A discussion of the four themes supported by the results is presented below, starting with the perceptions of the quality of delivery services.

1) Perception of the quality of delivery services at the health facilities.

Perceived quality of delivery services was identified as the most critical factor shaping the decision of women on where to perform in both settings. The majority of women said they desired services from a health facility with qualified doctors and nurses, and one that had access to an obstetrician/gynecologist and pediatrician in case of complications. This is illustrated in the quote below;

> *"…Then again I can add when I went to deliver at Private health facility C there was a complication when I went for my CS. I wanted a qualified doctor because you never know what will happen…"*

(FGD in private facility, rural setting)

Other important quality-related factors included facility-based factors such as the presence of operational amenities (for instance, a functioning theater for cesarean sections), extended hours of operation, and availability of medication, supplies, and food. Private not-for-profit health facilities such as those run by missions were perceived to provide higher quality of care compared to public and private, commercial facilities in both settings. Women identified technical skills like cesarean sections and non-technical aspects like customer care as important attributes.

"…So when I got to mission hospital A they took good care of me from the gate, they were talking to me very nicely, they gave me hope, and even at the theatre they were talking to me and they tried to make me feel I like I am in the right hands. It makes somebody feel compelled to receive the service at this hospital. It made me want to deliver at this hospital. This is something that I have to do because there are people who care and want to see this delivery happening well…"

(FGD at mission hospital, peri-urban setting)

Outside the preference for mission health facilities by both groups of women, the peri-urban setting women described the highest quality of delivery service from the private health facilities as seen in the quote below;

"… You know the first thing is I have previously given birth in a public hospital and when I went there they would chase me and at that time I am almost due and I am in so much pain. So the suffering I went through made me decide not to go to a public hospital again. I decided to go to a private hospital because you know there you use your money so you will be treated well. And when I went to Private Hospital B I was treated well and that is why I went there again, I have given birth to two children there…"

(FGD respondent, private hospital, peri-urban setting)

In particular, they had a strong preference for near-by low-cost private hospitals. This was in direct contrast to the rural women, who reported preferring public health facilities. Women in the rural setting showed a greater preference for public tertiary health facilities in particular, mainly because of their ability to respond to obstetric emergencies and their cesarean-section capacity. The same women, however, complained about public primary health facilities and mentioned that they had inconsistent hours of operation and lacked sufficient essential staff, such as nurses. Sometimes there was only one nurse caring for a large number of women during labor. There were also doubts regarding the ability of smaller primary health facilities to respond to obstetric and neonatal complications. They described situations in which the primary health facilities were incapable of handling complications as illustrated by the quote below:

"…If you don't have any complications, they can help you deliver normally here at dispensary A, but if you are to undergo operation they have to refer you to tertiary hospital A …"

(FGD at public facility rural setting)

According to Bohren et al.'s framework, the theme of perceived quality of care presented four barriers to facility-based delivery, namely; (a) facilities perceived as providing low quality of care; (b) mistreatment and abuse by healthcare workers; (c) neglect and delays in receiving care at the facilities; and (d) inadequate health-facility staffing and infrastructure. In this study, findings about the perceived quality of care are re-classified into three new sub-themes, namely: a) Availability of physical amenities at health facility and b) interpersonal treatment at the health facility c) Availability of referral services. All the sub-themes focus both on the structural and process inputs to high-quality delivery care. The barrier of availability of physical amenities is discussed in more detail below.

Availability of physical amenities- availability of equipment and supplies. The women in both settings said that they generally knew whether a health facility had equipment and supplies. They often got the information from family and friends who had used the facility before (see table 4.3 on maternal health utilization variables). They said that they were afraid of using facilities that lacked essential equipment for complicated deliveries. They were generally aware that a well-equipped theatre, oxygen, incubators, and the capacity for blood transfusions were lifesaving in cases of obstetric or neonatal emergencies. As a result, rural women chose to bypass primary health facilities that lacked equipment, preferring the larger tertiary maternity health facilities (often public) as shown in the quote below:

> *"…I had come here to health Centre C (primary health facility,) but the nurse in charge told me that they did not have anti-D and they asked me to go to sub-county hospital A (tertiary health facility) and have the anti-D injection there. My wish was to deliver here at the health Centre C but I delivered my baby at sub-county hospital A…"*

(FGD at public facility, rural setting)

Health care workers similarly claimed that they lacked sufficient equipment for dealing with obstetric emergencies and often did not know how to respond to multiple women upon the onset of complications for one or more. They went on to describe difficult situations in which they could not only not respond to the complications, but also could not effectively refer the women with complications to a higher level of care because of the lack of essential health-facility infrastructure, such as oxygen and ambulances, as seen in the quote below:

> *"…in this health facility, you will find that we do not have the equipment. We do not have oxygen, yet in maternity set up oxygen is essential. Our "resuscitaire"- a flat table or*

high place to put and care for a newborn who is not breathing is not working… you see the essential things that you need in case of a complication. We do not even have an ambulance… in maternity you need an ambulance because you do not know the outcome of a delivery…you can admit a really good client without any problem, then her birth becomes complicated. So generally I think it is the lack of equipment and resources…"

(Nurse at public facility, peri- urban setting)

Healthcare workers in both settings additionally described the quality of service in terms of inadequate staffing and spoke of situations where nurses were overloaded with multiple women in differing stages of labor and were unable to prioritize which mothers to focus on for delivery or subsequent referral. This led to the dilemma of a single healthcare worker attending to several women at once and hence poor-quality care, as described in the quote below:

"…Another thing is the nurses here are overloaded with work, and that's why they aren't offering quality healthcare. The moment you are in a peripheral facility, and you have 4 or 5 mothers whom you are supposed to take care of, and one mother complicates, and you are alone, what are you supposed to do? You take all the mothers with you, go with them to the referring facility or what are you supposed to do? Maybe the four other mothers are okay and they will deliver, but you have gotten one who needs higher-level care, what will you do? Will you carry all the mothers...?"

(Public health maternity nurse in a rural setting)

Physical amenities. Cleanliness at the health facility. Peri-urban women were predominantly concerned about hygiene standards (particularly of delivery beddings, toilets, and common areas) and claimed that a clean hospital, irrespective of its status as private or public, was a critical factor in how they made their decisions on where to deliver. If a facility was dirty and unhygienic, they would consider other options for delivery, and they often inspected health facilities prior to going to deliver at them, as seen in the quote below:

"…You know when you enter a hospital you should not see blood everywhere… if you do you just conclude they are not hygienic. However, here, I did not see anything like that, so I chose to deliver my baby in this hospital..."

(FGD in a public facility, peri-urban setting)

*Security of newborn babies***.** Because of rural-urban migration patterns, women are constantly moving into new peri-urban settlements. In this study women who had recently move to the peri-urban setting described receiving advice about the health facilities, particularly tertiary health facilities that had reputations for loss of newborns. They were told to be careful, and this was corroborated by media reports that confirmed stories of women who had lost babies at large tertiary maternity settings. Hence, women in peri-urban settings expressed concerns for the security of newborns and feared potential theft of babies, as described in the quote below:

> *"…Moreover, they told me if I gave birth to my child in that hospital they would steal it… if went to major public maternity hospital A, they advised me to go to a private hospital. So I looked around and thought of which private hospital to go to because, you know, I was new to Nairobi and I did not know where to go. I did not even know those hospitals. I was told that if I boarded a matatu (public transportation), it would take me to private hospital D, so I just went …"*
>
> *(FGD at a public health facility, peri-urban setting)*

Interpersonal treatment at the health facility. Attitude of healthcare workers. Attitudes of healthcare workers greatly influenced the choice of facility in both settings. Women felt safe when receiving care from providers who "treat them well," and were generally unhappy with verbal abuse. Some specifically complained about nurses, saying they lacked a positive attitude and were often reprimanding during labor when compared to the doctors. They described some doctors as being understanding to their situations as seen in the quote below;

> *"…They need to understand you, especially during that moment. Like for me when I was delivering, you find that the nurses would slap you or pinch you, and at that time you are already in a bad situation. And the reason why people prefer this hospital is because of how understanding the doctors are, no matter how you behave. They just come and check on you from time to time, and they understand your conditions..."*
>
> (*FGD at a private health facility, rural setting)*

Additionally, first-time mothers who were unprepared for delivery, mostly in the peri-urban setting where women were younger (see Table 4.1), also described how they were reprimanded and not given instructions during the delivery. They were aware of the need for "toughness" that the health workers would invoke but accused them of being unkind and scolding them for inexplicable reasons, as seen in the quote below:

> *"...If you meet some nurses they are so rude and maybe that is your first time and you do not know what to do. So they scold you and abuse you, and that is not nice. They should at least explain to you what you do not know. When you are going to deliver, I know they need to be a bit tough so that you do not injure the baby, but when they scold you for no*

apparent reason, it is not good. So I would say that the nurses in this facility need to be a bit kind…"

(FGD at a public facility, peri-urban setting)

2) Influence of sociocultural context and care experiences.

Influence of antenatal care (ANC) services. Women in both settings regularly attended and valued ANC visits (see table 4.2 showing maternal health utilization data). However, some instances of discrimination were reported by mostly young women who were first-time mothers seeking ANC care at a different health facility from their delivery facility within the peri-urban setting. Healthcare workers would demand to see their ANC booklets, and if they discovered that the women did not have them, they reported being requested to re-take the preliminary ANC tests, such as blood pressure, urine and blood tests, despite their complaining that they had already done so. As a result, their admission into delivery rooms could be delayed, as evidenced by the quote below:

"…Then again, we have these young girls who are pregnant, and they do not go for ANC clinics. So you find when they go to deliver they do not have the clinic book to show the blood tests done and so before anything they are asked to do blood tests you find these girls going to hospitals in so much pain but they are not assisted until the blood tests are carried out. So if there is a way these facilities can be upgraded so that these girls can be assisted to deliver as they await some of these blood tests it would be good…"

(FGD participant, public facility peri-urban setting)

Effects of the free maternity policy. Bohren et al.'s (2014) framework describes national-level policies influencing women's place of delivery. In Kenya in 2013, a new national policy of free maternity service was unveiled to mitigate the high costs associated with childbirth. Women in both settings were aware of the government's free maternity service policy and mentioned that they believe the policy had resulted in increased utilization of public health facilities and allowed them to opt for free services, particularly in the rural setting as seen in the quote below:

"…Women prefer public hospitals first of all because it is free. Someone cannot imagine paying to deliver in a private facility, and a public one is free. Also, public facilities are bigger, and they have the most equipment, and private sometimes does not have everything like theatres…"

(FGD respondent public facility, rural setting)

However, in the peri-urban setting some women still chose to deliver at private health facilities, claiming that they provided higher-quality services than public health facilities. Some women said that they were aware of the free delivery service but because of the generally poor-quality services they received on previous visits they chose not to seek the free services for their next deliveries, as seen in the quote below;

> *"…Like I told you, I have delivered in those hospitals offering free maternity. I did not even remove a shilling, but I was not happy. When I went, I got there, and they started chasing me telling me that I was not due yet, and I had dilated 4 cm. A doctor was examining us, and one told me to rest on the bed because I had dilated 7 cm, and then another one came to chase me telling me I am 3cm. I really suffered when I went there, and for my next delivery I decided to go to a private hospital that was close to where I lived …"*
>
> *(FGD public facility, peri-urban setting)*

3) Resource availability and access.

Costs of delivery services. Overall costs were a major concern for women in both settings. This included direct costs related to financing the actual delivery service, but also indirect costs like transportation costs or opportunity costs associated with seeking delivery care. Sometimes additional costs were introduced inadvertently by some of the staff in public health facilities, leading to confusion and misunderstandings in health facilities that were advertised to be free. An example of a misunderstanding is illustrated below:

> *"…To begin with, at the public hospital they told me that I had to pay 4,800 Ksh (48 USD) for the delivery service. My husband asked what it was for and they reduced it to 800 Ksh. He still insisted on knowing what the charges were for since he knew at a public health institution, maternity services were free of charge. In the end, he did not pay even a single cent…"*
>
> *(FGD public tertiary health facility, rural setting)*

Health insurance entitlements under the National Health Insurance Fund (NHIF) were also not clear at the health-facility level and some of the healthcare workers expressed limited knowledge of the NHIF entitlements for maternity services. They expressed frustration at what they considered limited coverage that could not meet the needs of the women, and hence they would ask the women to purchase items such as drugs outside the coverage as described below by a nurse at a tertiary health facility:

"…I am not an expert on NHIF, but I think the government should work to at least increase the amount, in that you find that paracetamol costs 30 Ksh and outpatient coverage with NHIF for the month is covered at 100 Ksh. That poor mother has to pay 500 shillings monthly, and she will not even get a full dose of paracetamol...so she will have to go home and use less drugs…"

(Nurse, maternity hospital, peri-urban setting)

There were some concerns over the fact that the NHIF did not accredit some private health facilities, and this resulted in limiting women's choice of these facilities and restricting them to settle for public health facilities despite the fact that they had attended 'clinic' (ANC services) at another facility, such as a mission-run one. This is described below by woman who had hoped to deliver at a mission health facility:

"… I can say the reason why I did not consider this hospital at first when I came here was that when I was attending clinic here, I saw that they did not accept NHIF cards, and what I really wanted was to use my card to pay for delivery services. So when I came here, I found out that they were not using cards, and I decided not to come to this hospital…"

(FGD at mission hospital, peri-urban setting)

Transportation and distance to delivery health facilities. Women in this study's rural setting opted to deliver in health facilities that were close to their homes because of the geographical distances to health facilities. Most family members urged the women to deliver in health facilities that were close to them for ease of movement, as seen below:

"…I delivered my baby right here at sub-county hospital A. As for my first baby, it was in a private facility, because when my labor pains started, my family members thought of taking me to the closest health facility so they brought me here. For my second baby, I delivered here, and so it is when it was time for this one I knew where I was going to deliver…"

(FGD at a public facility, rural setting)

Reasonable distance in the peri-urban setting was framed as facilities that were easy to reach via public transport. Security concerns were rife at night where there were fewer options, such as private taxis only, which were often more expensive.

"…Also because it is the nearest. You can walk here or take a matatu (public transportation) for 10 Ksh (1 USD) …"

(FGD at a private hospital, peri-urban setting)

Availability of referral services. Availability of referral services was mentioned more commonly amongst the rural women. They felt that referral services were important because of the limited hours of service at some of the health facilities where night deliveries were not available. They also described situations where the closer health facilities lacked the capacity to deal with caesarean sections, and hence if you had any complications the only way to get emergency obstetric care was via a referral. They mused that it was easier to choose to go to a higher-level health facility with the ability to deal with obstetric complications directly without needing to later get referred, as seen in the quote below by a woman who describes the referral process at smaller peripheral health facilities:

"…What I feel is that when one goes to other facilities in case of any complications with your baby, they only take care of what they can and then later refer you here to the sub-county hospital. Rather than passing through all that, it is easier for a mother to come to sub-county hospital A, and everything is done here and get discharged without going through the referral process…"

(FGD at rural health facility)

4.3. The Quantitative Study

The quantitative study was constituted of three main phases; a pilot DCE to establish the appropriateness of the selected attributes. A second phase with the final DCE and a survey that collected sociodemographic and maternal health utilization variables.

4.3.1 The Pilot DCE

The pilot DCE was aimed at establishing the cognitive difficulty for women based on the wording of the questions of the DCE, and refining the number of attributes that were selected from the qualitative study and the literature review. The pilot also aimed at providing parameter estimates for the multinomial logit and their level of significance at a low sample size. Thirty women were chosen because other pilot studies on similar DCE's in Kenya have used a similar small number of respondents (Obadha et al., 2019). The characteristics of the women in the pilot study are summarized in Table 4.3

Table 4.3. The sociodemographic characteristics of the women in the pilot conducted in Embakasi-West sub-County

Sociodemographic variables	N (%)
Age categories	
18-25 years	18 (60)
26-35 years	12(40)
Marital status	
Single	6 (20)
Married	24 (80)
Education	
Primary school	14(47)
Secondary school	13(43)
University/tertiary	3 (10)
Residence	
Lives in E. West	20 (67)
Lives out of E.West	10(33)
Head of household status	
Woman not HoH	26(87)
Woman HoH	4(13)
Woman's influence on decision making within HH	
Woman had no influence	10(13)
Woman had influence	20(67)
Residence (move in 5years)	
Moved in last 5 years	26(87)
Moved to area over 5 years ago	4(13)

Legend

HoH- Head of household

The results indicated that the version with sixteen questions could be handled cognitively by the women. The women provided feedback that the choice tasks and the scenarios as presented could be understood, the wording that was used to describe the attributes could be understood. The levels of the attributes were realistic and the questionnaire design was appropriate and could be understood using the pictorial presentation on Open Data Kit (ODK).

Table 4.4. Discrete Choice Experiment (DCE) Results showing context specific attributes from the pilot

Naivasha sub-County	Embakasi-North sub-County
Distance to the health facility	Distance to the health facility
Interpersonal treatment at the health facility	Interpersonal treatment at the health facility
Referral process at the health facility	Referral process at the health facility
Type of health facility	Type of health facility
Cleanliness of the health facility	Cleanliness of the health facility
Transportation access to town for delivery	Transportation access during the night
Availability of referral ambulance	Security of newborns at health facilities
Availability of medical equipment and drugs	Location of health facility
Time taken to reach health facility	Time taken to reach health facility
Qualifications of health worker	Qualifications of health workers
Type of health worker conducting delivery	Type of health worker conducting delivery
Gender of the health worker	Availability of medical equipment and drugs
Costs of the delivery service	Costs of the delivery service
Informal costs associated with the delivery	Informal costs associated with the delivery
Quality of clinical services during delivery	Quality of clinical services during delivery
Attitude of health care workers	Attitude of health care workers

Table 4.5. Final list of attributes selected for inclusion into the DCE survey

Naivasha sub-County	Embakasi-North sub-County
1. Quality of clinical care	1. Quality of clinical care
2. Attitude of the healthcare workers	2. Attitude of the healthcare workers
3. Availability of medical equipment and drug supplies	3. Availability of medical equipment and drug supplies
4. Availability of referral services	4. Cleanliness of the health facility
5. Cost of the delivery services	5.Cost of the delivery services
6. Distance to the health facility	6.Distance to the health facility

After discussions and a ranking exercise these attributes were reduced to six of the most important attributes namely quality of clinical services during delivery, availability of medical equipment at health facility, attitude of health care workers, distance to the delivery health facility, cost of the delivery service. Cleanliness of the health facility and referral health facility were selected in the peri-urban and rural setting respectively. Lastly a multinomial logit model was run to assess the pilot data and was used to see the level of significance of the parameter estimates of the attribute to assist with experimental design. All the attributes showed the expected signs. The results showed that all the attributes were statistically significant at the 95% confidence level.

Table 4.6: The multinomial logit model showing parameter estimates for the DCE pilot conducted in Embakasi-West sub-County.

Attribute	β	S.E	P -value	C.I
Attitude	1.302	0.222	<0.0001	(0.865-1.738)
Medequip	2.126	0.272	<0.0001	(1.592-2.660)
Qualclin	0.395	0.194	0.042	(0.015-0.777)
Distance	0.293	0.162	0.07	(-0.002-0.612)
Clean	1.383	0.251	<0.0001	(0.890-1.875)
Costs	-0.0001	0.00005	0.012	(-0.0002--0.0003)

Attitude-attitude of healthcare workers, Medequip-medical equipment and drugs, Qualclin- Quality of the clinical delivery services, Distance- Distance to the health facility, Clean: cleanliness of the health facility.

4.3.2. Respondent's Sociodemographic Characteristics

474 and 481 women were invited to participate in the rural and peri-urban settings respectively. The DCE survey was successfully administered to 466 and 421 women in the rural and urban settings respectively representing a 98% and 87% response rate respectively. There was incomplete data for eight and fifty-nine respondents in the rural and peri-urban settings respectively. The average age of the rural women was 26 years, whereas for the peri-urban women was 22 years. Of the rural women, 32% were primiparous (giving birth for the first time), compared to 52% in the peri-urban setting. Marriage rates were more similar, with 88% of the rural women married compared to 83% of the peri-urban. For schooling, 86% and 88% of the women in the rural and peri-urban settings respectively, had attained a secondary school education. About 60% and 80% respectively of the heads of household had attained up to a secondary education in the rural and peri-urban settings. Only 18% of the rural and 17% of the peri-urban women were heads of household, but 95% and 87% of rural and peri-urban women respectively claimed to have influence over household-level decisions. Approximately 83% and 87% of rural and peri-urban women, respectively, reported that they were not the main source of household income. Finally, about 67% and 52% of rural and peri-urban women reported having moved to the study setting from elsewhere within the last five years. A summary of the demographic characteristics of the women is shown in Table 4.7. below.

Table 4.7. Sociodemographic characteristics of women in Embakasi-North county (N=421) and in Naivasha sub-County (N=466).

	Embakasi-North		Naivasha	
Sociodemographic variables	**N**	**(%)**	**N**	**(%)**
Age n (mean(SD))	24 (0.2)		26(5.1)	
Marital status				
Single	68	17	57	12
Married	353	83	409	88
Education				
Primary school	147	35	175	38
Secondary school	225	53	221	48
University/tertiary	49	12	66	14
Parity				
1	251	52	151	32
> 2	230	48	215	68
Head of household status				
Woman not HH	309	83	381	82
Woman head of HH	112	17	85	18
Head of household education				
Primary school	66	16	100	27
Secondary school	187	44	196	53
University/Tertiary	168	39	72	20
Woman's influence on decision making within HH				
Woman had no influence	54	13	18	5
Woman had influence	367	87	363	95
Main-earner status				
Is not the main earner	366	87	386	83
Is main earner	55	13	79	17
Residence (moves)				
Moved in 5 years	218	52	226	67
Moved over 5 years	203	48	112	33

4.3.3. Maternal Health Utilization Variables

The quantitative survey had second section that included maternal health utilization domains on reproduction and pregnancy that cover questions on pregnancy experience such as place of delivery, level of delivery health facility, pregnancy intentions, planned delivery health facility, frequency of ANC, referrals, obstetric complications, specialist services, whether the woman had a cesarean section or not and whether the women has health insurance. The results are summarized in Table 4.8. below

Table 4.8. Maternal health utilization variables for women in Embakasi-North (N=421) and Naivasha (N=466).

Maternal health utilization variables	**Embakasi-North**		**Naivasha**	
	N	(%)	N	(%)
Place of delivery				
Public health Facility	235	60	346	74
Private health Facility	132	31	91	19
Home deliveries	27	19	29	6
Level of health facility				
Tertiary health facility	318	75	323	69
Primary health facility	76	18	114	24
Home deliveries	27	7	29	6
Pregnancy intentions				
Pregnancy not intended	113	27	159	34
Pregnancy intended	302	73	307	66
Planning for delivery				
Didn't plan health facility	109	26	119	26
Planned health facility	311	74	347	74
Number of ANC visits attended				
ANC visits <4	182	43	252	54
ANC visits >4	239	57	214	46
Referral status				
Not referred to a tertiary health facility	390	93	452	97
Referred to tertiary health facility	31	7	14	3
Specialist services				
Did not see specialist	355	84	411	88
Saw a specialist	66	16	55	12
Whether the woman had a cesarean section				
Didn't deliver via cesarean	355	84	404	87
Had a cesarean section	66	16	62	13
Health insurance status				
Didn't have health insurance	325	77	214	46
Had health insurance	96	23	251	54

On variables related to maternal health utilization, two thirds of rural women reported that their pregnancies were intended, compared to 73% for the peri-urban women. About three-quarters of women in both settings reported that they planned in advance which health facility they would use for their delivery. About 46% of the women in the rural setting had attended the mandatory four ANC visits as compared to 57% in the peri-urban setting. Only 3 % of rural and 7% of peri-urban mothers received a referral for the delivery, while 12% of rural and 16% of peri-urban women reported being seen by a specialist doctor. In addition, 13% of rural and 16% of peri-urban women delivered via cesarean section. About 55% of rural women had health insurance compared to only 23% of women in the peri-urban site.

4.3.4 The Discrete Choice Experiment (DCE) Results

This study used a DCE survey to elicit attributes that women value when making the decision on place of delivery. For the base multinomial logit (conditional) model all the attributes for place of delivery were statistically significant at the 0.001 level in both settings implying that all the chosen attributes were important to the women.

In the Embakasi-North setting, the variable with the greatest association with the selection of a health facility was cleanliness, (β=1.488 $p<0.001$), the positive coefficient for cleanliness implies that it is the most valued attribute and had the magnitude of the β shows that has the largest influence in the women's choice for place of delivery within the peri-urban site. This was followed by the attribute of availability of medical equipment and drugs (β=1.43, $p<0.001$), and thirdly the alternative specific constant (ASC) (β=1.424 $p<0.001$). The ASC signifies the opt-out alternative and implies that the women had a preference for neither of the two health facilities and had a preference for a home delivery. The attribute on kind and supportive Attitude of health care workers and quality of delivery services at the health facility were ranked 4th (β=0.67, $p<0.001$) and 5th (β=0.04, $p<0.001$) respectively. The attribute on the distance to the health facility and cost of delivery were ranked 6th (β=0.339, $p<0.001$ and 7th (β= 0.0002 $p<0.001$) respectively. The positive coefficient for both distance and costs imply that women have a preference for long distances and high costs. These two results are contrary to economic theory that posit that most people would have a preference for low short distances and low costs. In the case of the distance this implies that women were bypassing health facilities that were closer to their residences to access health care services at health facilities that were further.

In the Naivasha setting, for the base multinomial logit model, the variable with the greatest association with choice of health facility was the attribute on kind and supportive attitude of the health care workers, (β=1.184 $p<0.001$). See (Table 4.8). This was followed by availability of medical equipment and drugs (β=1.073, $p<0.001$), and thirdly the quality of clinical services during delivery (β=0.826 $p<0.001$). The distance to the health facility was ranked 4th with a coefficient with a positive sign positive, (β=0.457, $p<0.001$) implying that women had a preference for health facilities that were further away. This finding suggests that women in this setting would bypass closer by health facilities to deliver at health facilities further off. The availability of referral health facility was ranked 5th (β=0.266, $p<0.001$). The cost of delivery services was ranked 6th with a positive coefficient (β= 0.00002 $p<0.001$) suggesting a utility for high costs, a finding which is similar to the peri-urban context and contrary to theory that shows that most people have a disutility for high costs.. The alternative specific component was ranked last and women had the weakest association in the choice of place of delivery. The negative sign of the coefficient suggests that women prefer a home delivery (β=-0849, $p<0.001$) respectively. Table 4.9 shows the relative rankings of the attributes from the logit model.

Table 4.9. The multinomial logit model for a DCE on preferences for place of delivery amongst women in Naivasha and Embakasi-North sub-Counties.

	Naivasha			**Embakasi-North**		
Attribute	**β**	**P-value**	**C.I**	**β**	**P-value**	**C.I**
Attitude	1.184	<0.001	(1.11- 1.25)	1.348	<0.001	(1.27-1.42)
Medequip	1.073	<0.001	(1.01-1.13)	1.435	<0.001	(1.34-1.53)
Qualclin	0.826	<0.001	(0.76-0.89)	0.386	<0.001	(0.30-0.47)
Distance	0.457	<0.001	(0.39-0.52)	0.339	<0.001	(0.27-0.41)
Referral	0.266	<0.001	(0.20-0.33)			
Clean				1.488	<0.001	(1.40-1.57)
Costs	0.000018	<0.001	(2.55e-06-0.00033)	0.0002	<0.001	(0.00018-0.0002)
ASC	-0.849	<0.001	(-.97-0.73)	1.424	<0.001	(-1.162-1.685)

Legend

Attitude: attitude of healthcare workers, medequip- medical equipment and drug, Qualclin: quality of the clinical delivery services, Distance- Distance to the health facility, Referral: referral service availability, Clean: cleanliness of the health facility, ASC: Alternative Specific Constant.

Table 4.10. Rankings of the attributes in a DCE for place delivery amongst women in Naivasha and Embakasi-North sub-County.

Naivasha	**Embakasi-North**
1.Attitude of healthcare workers	1. Cleanliness of health facility
2. Availability of medical equipment and supplies	2. Availability of medical equipment and supplies
3.Quality of clinical services at delivery	3. Attitude of health care workers
4.Distance to the health facility	4. Alternative Specific Constant (ASC)
5.Referral services availability	5. Quality of clinical services at delivery
6. Costs of the delivery service	6. Distance to the health facility
7. Alternative Specific Constant (ASC)	7. Costs of the delivery service

4.3.5. Generalized Mixed Multinomial Logit Results for Naivasha Sub-County

The results of the generalized mixed for the rural sub-County are summarized in Table 4.11 below.

Table 4.11. Generalized mixed multinomial logit model to explain preference heterogeneity in choices for place of delivery made in Naivasha sub-County.

Attributes	**Mean Coefficient values**		**Standard Deviations (SD)**	
	β	**p-value**	**β**	**p-value**
Attitude.	1.972***	<0.0001	1.582***	<0.0001
Medequip.	1.764***	<0.0001	0.778***	<0.0001
QualClin.	1.316***	<0.0001	1.577***	<0.0001
Distance.	0.759***	<0.0001	0.374***	<0.0001
Referral.	0.436***	<0.0001	0.535***	<0.0001
ASC.	0.289*	0.377	3.202***	<0.0001
Cost.	-10.089***	<0.0001	0.112*	0.639
No. of Observ.	22, 368			
Wald Chi	2173.84			
Prob >chi2	0.0000			
Log likelihood	-4400.93			

Legend

*Attitude: attitude of healthcare workers, Medequip: medical equipment and drugs, ASC: Alternative Specific Constant, Qualclin: quality of clinical delivery services, Distance: distance to the health facilities, * Significance at the 90% level ** significance at the 95% level *** significance at the 99% level*

For the generalized mixed multinomial logit model with no interactions in Naivasha, we found out that all the mean coefficients values for all the attributes, were statistically significant at the 99% level with the exception of the ASC attribute which showed significance at a lower level 90% See (Table 4.12). This finding of statistical significance meant that we could reject the null hypothesis that stated that the attributes selected were not important to the women respondents. The positive sign on the ASC coefficient suggests that some women have a utility for home deliveries. The magnitude of parameter estimate and is statistical significant at the 90% level signifying that the preference is weak.

All the attributes had statistically significant parameter estimates for the standard deviation, except the cost attribute. This indicates strong preference heterogeneity for all the attributes with the exception of cost that shows weak preference heterogeneity**.** This finding implies that women of varying sociodemographic characteristics in this setting have individual-specific parameter estimates that may vary from the mean sample population. (Hensher, Rose, and Greene, 2015).

4.3.6. Generalized Mixed Multinomial Logit Results for Embakasi-North Sub-County

The results of the generalized mixed for Embakasi-North sub-County are summarized in Table 4.12 below.

Table 4.12: Generalized mixed logit model showing means and standard deviations to explain preference heterogeneity in choices made by women in Embakasi-North sub-County.

Attributes	**Mean Coefficient values**		**Standard Deviations (SD)**	
	β	**P**	**β**	**P**
Clean.	2.258***	<0.0001	1.7141***	<0.0001
Medequip.	2.266***	<0.0001	-0.2786***	<0.0001
ASC.	2.008**	0.001	0.5871***	<0.0001
Attitude.	2.039***	<0.0001	-0.0053***	<0.0001
QualClin.	0.570***	<0.0001	0.3015***	<0.0001
Distance	0.445***	<0.0001	5.4984*	0.680
Cost	-8.0906***	<0.0001	-0.013*	0.792
No. of Observ.	20208			
Wald Chi	80646.83			
Prob >chi2	0.0000			
Log likelihood	-2813.6941			

Legend

Clean: cleanliness of the health facility, Medequip: medical equipment and drugs, ASC-Alternative Specific Constant, Attitude- Attitude of healthcare workers, Qualclin: Quality of the clinical delivery services, Distance- Distance to the health facility

For the generalized mixed multinomial logit model with no interactions in the Embakasi-North setting we found out that all the mean coefficients values for all the attributes, including the opt-out, were statistically significant (Table 4.11). This meant that we could reject the null hypothesis that stated that the attributes selected were not important to the women respondents. However, the Alternative specific constant (ASC) /opt-out option had a lower significance level, implying that there was less variance in the characteristics of the respondents who chose this option suggesting that women of similar characteristics preferred home deliveries.

All the attributes had strong statistically significant parameter estimates for the standard deviation, for the first five variables except the attributes on cost and distance attributes that had weak statistically significant parameter estimates at 90% for the standard deviations. This suggested that in this setting, there was insufficient variability among women for specific parameter estimates that from the mean sample population (also known as heterogeneity of preference).This implies that most of the women that had weak preferences were from a specific sociodemographic characteristic. This can be determined by further analysis using the interactions.

4.3.7. Mixed Multinomial Logit Regression Model with Interactions between Sociodemographic and Attributes in the for Embakasi-North Sub-County

The results of the Mixed Multinomial logit model with interactions between the sociodemographic variables and the attributes for the peri-urban setting are presented in Table 4.13 below

Table 4.13. The Mixed Multinomial logit model with interactions between sociodemographic variables and attributes for women in the peri-urban setting.

	Base model		Interaction terms (Mean Parameter) w/Sec educ		w/ age		w/ marital status		w/main earner	
Attribute	**β[a]**	**p-value**	**β[a]**	**p-value**	**β[a]**	**p-value**	**β[a]**	**p-value**	**β[a]**	**p-value**
Medequip	2.27***	<0.001	1.660***	<0.001	0.05***	<0.001	0.05*	0.606	0.87***	<0.001
Clean	2.26***	<0.001	1.769***	<0.001	-0.04***	0.007	-0.28***	<0.001	1.65***	<0.001
Attitude	2.04***	<0.001	1.681***	<0.001	0.12***	0.001	1.15***	0.001	0.246*	0.470
QualClin	0.57***	<0.001	0.575***	<0.001	-0.02***	<0.001	-0.036*	0.614	-0.09*	0.285
Distance	0.46***	<0.001	0.467***	<0.001	0.02***	<0.001	0.44***	<0.001	0.40***	<0.001
Cost, Ksh[b]	-8.09***	<0.001	-8.166***	<0.001	-11.27***	<0.001	-8.102	<0.001	-8.26***	<0.001
Interaction terms (SDs)										
Medequip X covariate	-	-	0.33***	<0.001	0.007***	0.001	0.04*	0.333	0.093*	0.456
Clean X covariate	-	-	0.39***	0.001	0.01***	0.016	0.16*	0.456	0.56***	0.001
Attitude X covariate	-	-	1.31***	<0.001	0.04***	0.002	0.61***	0.001	1.11***	0.001
QualClin X covariate	-	-	0.698***	<0.001	0.001***	0.228	-0.004*	0.491	0.009*	0.727
Distance X covariate	-	-	0.008*	0.700	-0.0001*	0.860	-0.0001*	0.993	-0.011*	0.778
Cost X covariate	-	-	0.043*	0.208	0.0013*	0.986	-0.031*	0.378	0.07*	0.679
No. of respondents	411									
No. of observations	20,208									
Log-likelihood	-2831.69		-3308.61		-2845.93		-3835.91		-3691.09	
Prob> $\chi 2$	0.0000		0.0000		0.0000		0.0000		0.0000	
Likelihood ratio $\chi 2$	80646.83									

For the generalized mixed multinomial logit model for the peri-urban setting, we ran models testing for interactions between the sociodemographic variables that have been proven in the literature on facility-based delivery for being significant predictors of facility use such as age, marital status, education and main earner status.

Women with a secondary education had strong and statistically significant preferences for the attributes for availability of medical equipment, cleanliness, attitude of health care workers and quality of clinical services. They only had weak preferences for the distance and cost attributes with the positive signs indicating that they preferred longer distances to the health facility contrary to theory. This finding suggested that secondary educated women were well informed and were capable of assessing several of the attributes of a health facility that had the attributes that they valued. Older women (age category 25-39) had strong and statistically significant preferences for the attributes of availability of medical equipment and drugs, cleanliness, attitude of health care workers and quality of clinical care when compared with younger women (18-24 years). The older women had a weak preference for cost attribute with a positive sign on the coefficient signifying a utility for high costs.

A negative sign on the coefficient for distance implied a utility for short distances amongst the older women. Married women had a strong and statistical significant preference for the attribute of kind and supportive health care workers only. They had weak preferences for all other attributes. Women who described themselves as main earners within their households had a strong and statistically significant preference for a clean health facility and a health facility with kind and supportive health care workers. They had weak preferences for all other attributes. The log-likelihood test indicated that the interaction model was statistically significant and an improvement to the mixed logit model.

4.3.8. The Mixed Multinomial Logit Regression Model with Interactions between Sociodemographic Variables and Attributes for Women in Naivasha Sub-County

The results of the Mixed Multinomial logit model with interactions with selected sociodemographic variables for the rural setting are presented in Table 4.14 below.

Table 4.14. The Mixed multinomial logit model with interactions between sociodemographic variables and attributes for Naivasha

	Base Model		Interaction terms Mean parameters							
			w/Sec educ		**w/ age**		**w/ marital status**		**w/main earner**	
Attribute	β^a	**p-value**	β^a	**p-value**	β^a	**p-value**	β^a	**p-value**	β^a	**p-value**
Attitude	1.971***	<0.0001	-0.05*	0.771	0.004*	0.753	0.286*	0.082	1.38***	<0.0001
Medequip	1.764***	<0.0001	-0.15*	0.917	0.07***	<0.0001	1.61***	<0.0001	1.51***	<0.0001
QualClin	1.316***	<0.0001	0.04*	<0.328	0.05***	<0.0001	1.19***	<0.0001	1.11***	<0.0001
Distance	0.758***	<0.0001	0.149*	0.099	0.0005**	0.938	0.17*	0.033	-0.12*	0.110
Referral	0.436***	<0.0001	-0.0268*	0.787	0.02***	<0.0001	0.45***	<0.0001	0.22*	0.077
Cost, Ksh[b]	-10.08***	<0.0001	0.00008***	<0.0001	-13.41***	<0.0001	-10.31***	<0.0001	0.00003*	0.386
Interactions										
Attitude X covariate			0.27*	0.105	-0.02***	0.004	0.86***	<0.0001	1.11***	<0.0001
Medequip X covariate			0.36*	0.179	-0.03***	<0.0001	1.61***	<0.0001	1.51***	<0.0001
QualClin X covariate			0.289*	0.345	0.06***	<0.0001	1.43***	<0.0001	1.14***	<0.0001
Distance X covariate	-	-	-0.13*	0.410	-0.0002*	0.751	0.008*	0.804	-0.008*	0.910
Referral X covariate			0.52***	0.001***	-0.02	<0.0001	0.55***	<0.0001	-0.49***	0.007
Cost X covariate	-	-	0.00007***	0.026	0.321*	0.238	0.447*	0.224	0.00001*	0.800
No. of respondents	466	466	466	466	466	466	466	466	466	466
No. of observations	22,368		22,272		22,368		22,368		22,320	
Log-likelihood	-4400.93		-4493.82		-4399.34		-4473.60		-4472.99	
Prob> $\chi2$	0.0000		0.0000		0.0000		0.0000		0.0000	
Likelihood ratio $\chi2$	80646.83		1462.88		3256.14		1052.72		909.59	

For Naivasha sub-County women with secondary education had a strong and statistically significant preference for the availability of referral services and the cost of delivery services. The cost coefficient was positive, again contrary to theory implying that women had a utility for high costs of delivery services. The strong preference for referral services is possibly indicative of the status of the sub-County with many women preferring to bypass closer primary health facilities to access care at secondary and tertiary health facilities in the town centers. Younger women (18-25) had a strong and statistically significant preference for kind and supportive attitude of health care workers and a health facility with availability of medical equipment, good quality of clinical care and availability of referral health services. These findings imply that young women in this setting have access to information on the health system and can judge from the experiences of others what is required for a good health facility experience of care.

Married women in this setting equally had a strong and statistically significant preference for all the variables with the exception of distance. The coefficient for distance was once again positive suggesting that married women constitute the socio demographic profile of the women who are by passers and seek health care at higher level health facilities. They also had a weak preference for cost the coefficient for cost was positive suggesting that they had a utility for higher costs. Lastly women who identified as main earners had as strong statistically significant preference for all the attributes with the exception of distance and cost. They were however different from the other women in that they preferred a shorter distance as indicated by the coefficient sign. Their cost coefficient was also positive signifying a utility for high costs. The log likelihood rat for the interaction model was statistically significant indicating that the interaction model improved upon the base mixed multinomial logit model See (Table 4.14).

4.3.9 Assessing Trade-Offs between the Attributes

The ratio of two approximate coefficients in DCE reflects the ability of people to give up any attribute in order to obtain more of another and is an approximation of the Marginal Rate of Substitution (MRS) between the attributes (Hensher and Johnson 1981). The trade-offs between attributes are determined by the ratio of each of the two coefficients being negative (Amaya-Amaya et al. 2008). The denominator is the metric that the trade-off is measured in terms of this outcome by measuring the degree to which and attribute is weighted, can be used to determine the relative importance of all attributes. To measure what the MRS is, we evaluated the three most valued attributes against each other in each setting. The results are summarized in Table 4.15 below.

Table 4.15. Marginal rates of substitution (MRS) estimates for attributes for place of delivery in Embakasi-North and Naivasha sub-Counties

	Attribute $(-\beta_{1/}\beta_2)$		
Embakasi-North			
	Cleanliness/QualClin	-(1.488/0.386)	-3.854
	Cleanliness/Medequip	-(1.488/1.435)	-1.037
	Cleanliness/Attitude	- (1.488/1.347)	-1.105
	Medequip/QualClin	- (1.435/0.386)	-3.717
	Medequip/Attitude	-(1.435/1.347)	-1.065
Naivasha			
	Medequip/QualClin	-(1.073/0.826)	-1.299
	Medequip/Attitude	-(1.073/1.184)	-0.906
	Qualclin /Attitude	-(0.826/1.184)	-0.697
	Qualclin/Medequip	-(0.826/1.073)	-0.801
	Referral/Attitude	-0.266/1.184)	-0.225

Trade-offs in Embakasi-North. The largest magnitude of trade-off for the peri-urban setting was that between cleanliness of the health facility and quality of clinical care. Women were willing to give up receiving good quality of clinical care to receive care at a clean health facility almost four times. This was followed by medical equipment and supplies similarly women were willing to give up a health facility with good quality of care for one that had medical equipment and supplies. This is consistent with the multinomial logit model that places medical equipment and supplies as the second most valued attribute and was corroborated by the qualitative study.

Trade-offs in Naivasha. The largest magnitude of trade-offs for the rural setting was seen in the trade-off between the availability of medical equipment and the clinical quality of care received during delivery services. Women were willing to give up a health facility with good clinical quality of care for one that had medical equipment.

These findings suggest that women in the peri-urban setting found the most utility in a clean health facility even at the expense of good quality clinical care. On the other hand, the women in the rural settings seem to be aware of the value of the life-saving medical equipment at a health facility and its role in providing emergency comprehensive obstetric care during a complicated pregnancy.

4.3.10 Results of the Willingness-To-Pay (WTP) Estimates for Attributes

Using the conditional logit the women's marginal WTP for the different attributes were calculated. The results are presented in Table 4.16.

Table 4.16: Willingness to pay estimates for attributes for Embakasi-North and Naivasha sub-counties.

Attribute	**Embakasi-North** WTP, Ksh (95%CI)	**Naivasha** WTP, Ksh (95% CI)
Qualclin	**1,802.75** (-1432.95--2172.53)	**-24, 596.01** (-38813.69- -10378.33)
Attitude	**6,299.59** (-7206.64--5392.55)	**-36, 223.25** (-57117.34- -15329.15)
Medequip	**6,710.12** (-7397.52--6022.71)	**-33, 308.83** (-52,197.04- -14,420.62)
Distance	**1,588.47** (-1953.99--1222.95)	**-14, 472.98** (-23,013.71- -5932.25)
ASC	**4,845.54** (-5650.82--4058.25)	**-28, 761.99** (-43,204.36- -14,319.62)
Clean	**6,957.43** (-7711.37--6201.49)	
Referral		**-8,017.03** (-13,341--2692.785)

Willingness to pay in Embakasi-North. Women were willing to pay up to 6957 Ksh to deliver their babies in a clean health facility. The second most valued attribute was availability of medical equipment and supplies women were willing to give up 6710 Ksh to deliver in a health facility that had the requisite medical equipment and supplies. The attribute which women are least willing to pay for is a closer health facility with women willing to pay only 1588 Ksh to deliver in a health facility that was close to them

Willingness to pay in Naivasha. Women were willing to pay up to 36,223 Ksh to deliver their babies in a health facility that had health care workers with a kind and supportive attitude. The attribute which their most willing to pay second most is the availability of medical equipment and they are willing to pay 33,308ksh. The attribute that they are least willing to pay for is the availability of referral health services.

4.3.11 Assessing the Validity of the Mixed Multinomial Logit Results using the Log-Likelihood Ratio

In Embakasi-North sub-County the log likelihood ratio for the generalized mixed logit model was -2813.69. After the models with interactions with different sociodemographic profiles the model's explanatory power was improved for most interactions with the exception of the interaction between the attribute on attitude of health care workers and marital status and main earner status. See Table 4.13 and for the log-likelihood ratios.

In Naivasha sub-County, the log likelihood ratio for the generalized mixed logit model was -4400.93. After the models with interactions with different sociodemographic profiles the models explanatory power was improved for all the interactions. See Table 4.14 for the log-likelihood ratios.

4.4 Summary of the Qualitative Study Results

The qualitative analysis was intended to address research question one: What are the factors that affect the place of delivery in both settings. The research evaluated the facilitators as well as the facility-based distribution barriers. We sought to understand the delivery perspectives of women, their expectations of quality of care and how they affect their choice of healthcare delivery facility. We contrasted the women who chose to deliver to those who delivered at public health facilities at private health facilities. We found that the peri-urban women identified more facilitators for delivery in private health facilities, indicating a more favorable user experience compared to the various obstacles posed for delivery in public health facilities. The women in the rural setting had a preference for secondary maternity health facilities over the primary health facilities because of their ability to respond to obstetric emergencies.

The qualitative findings indicate that theme of perceived quality of services at the health facility was the most important theme discussed by respondents across both contexts. It is clear that the women had strong preference for structural quality of care that can be signified through inputs to care such as the physical amenities such as medical equipment and supplies and hospital infrastructure. Within the physical amenities the issue of cleanliness of the health facility was strongly mentioned by the women within the peri-urban setting signaling that women judge the quality of care and make decisions using easily observable criteria. Another unique finding for the peri-urban finding was that of security of newborns at peri-urban settings suggesting newborns were insufficiently protected in larger secondary maternities hence signaling poor quality care for the women.

The rural women on the other hand indicated the importance of inputs to delivery care such as the availability of equipment such as a functioning theatre for dealing with obstetric emergencies and resuscitation equipment for babies. In both settings the issues of food available and hot water for showering were raised as essential components of good quality care at a health facility. These structural elements were mostly found in higher level secondary and tertiary health facilities or private health facilities which women reported a preference for across settings.

The process aspects of quality of care was brought up women in both settings but was ranked the most important attribute by the rural women in Naivasha sub-County. These included interpersonal treatment at the health facility during delivery as well as aspects of mistreatment of women by health care workers during facility-based care. This finding emphasizes the importance of offering delivery care services that are respectful and preserve the dignity of the women. Such patient-centered care and responsive to women's preferences are essential components of high quality delivery care. It also signified the need for accountability for mistreatment of women amongst health care workers in health facilities.

On the theme of influence of sociocultural context and care experiences, especially within the peri-urban reports there were reports of younger women been denied maternity services because of the antenatal care card? This is care that does not correspond to equitable care. One of the goals of high quality care as defined by the WHO framework (2016).

Certain issues under the concept of access to healthcare, such as the impact of the free maternity program and the health care costs, have been identified as significant factors that affect where women choose to deliver. As a result of the free maternity program, women reported improved access to health-care facilities. Women who would otherwise have delivered at home may now opt to supply their preference at most public health facilities or certified private health facilities. Quality of treatment problems have, however, also been reported. Public health facilities have been accused of delivering "free" services with certain health facilities also insisting that women pay for such incidental products such as the diapers. Additionally, the issue of reimbursement by the national insurer NHIF posed several challenges and the health facilities ended up charging the women because of lack of accreditation.

In summary, both structural and process aspects of quality of care proved important to women across settings for the women's experience of care and policy makers need to pay closer attention on how to incorporate women preferences and provide delivery care that is person-centered hence meeting the needs of women across different contexts in order to improve maternal health outcomes.

4.5 Summary of the Quantitative Study Results

The findings from the pilot DCE confirmed that the DCE could be cognitively understood by women in low income settings and sixteen choice-sets were an appropriate number. The refinement of attributes reduced the proposed attributes from 16 to 6 and the wording of the attributes was refined to labels that could be easily understood by the women. DCE studies call for most attributes to be policy amenable (Balttusen et al., 2007). During the pilot study some of the attributes that were suggested and discarded included operations times, qualifications of healthcare workers, type of health facility. Some of these attributes were hard to specify and were not policy amenable. The costs variables were also set to represent realistic costs that women faced when paying for delivery services within the setting.

The main DCE was aimed at answering the research question Two: *What is the relative importance of attributes of place of delivery that women find important when making the choice for a place of delivery?* The findings from the main DCE experiment confirmed that all the attributes that had been selected for analysis were important to the women. The relative importance put the attribute on cleanliness and the attribute on the attitude of health care workers most important for the peri-urban and rural setting respectively. The attribute on availability of medical equipment and supplies was also ranked highly across both sites signifying that women were able to identify easily observable physical amenities within the health facility required for the birth experience and use the information for making choices on where to deliver.

The opt-out was highly ranked (third) in the peri-urban setting this finding signifies that some women had a preference for home deliveries. The proportion that chose the opt-out was low at both sites but still significant particularly in the peri-urban setting indicating that there is a small group of women that value preferences that might have been omitted by the DCE experiment or that women in that site were dissatisfied by the quality of services provided by the health facilities within this setting. The least preferred attributes across the two settings were the cost and distance attributes.

The quantitative surveys show that the women in this study were mostly young, married, multiparous women with a secondary education. They were mostly not the heads of household but reported having a strong influence on household decision making. A majority of them had moved into their respective settings within the last five years. Most of them had intended for their pregnancies and planned them. They had average ANC attendance and had low levels of referrals, use of cesarean section and specialist Doctors. Very few were main earners and slightly higher than half had health insurance in the rural setting with a significant majority in the peri-urban setting lacking health insurance. In both settings most of them delivered at a health facility classified as both public and tertiary. There were very few home deliveries at both sites (less than 10%).

The interactions models showed that younger unmarried women with a secondary education and who self-identified as main income earners in their household had a significant strong preference for clean health facilities in the peri-urban setting. Older women with a secondary education showed a strong preference for a health facility with availability of medical equipment and supplies. Older women, married women with a secondary education and who identified themselves as main earners showed a strong preference for a kind and supportive healthcare worker. Only women with secondary schooling showed a strong preference for quality of clinical care across both sites. Lastly all the interactions between the variables of cost and distance for the standard deviation were statistically insignificant at the 95% level for both sites for the mixed logit showing low levels preference heterogeneity. This implies that there was weak variation in the individual characteristics for the women who showed preference for these attributes. The only strong preference heterogeneity for costs was shown for rural women who had a secondary education.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The chapter sets out a description of the study results discussion. This provides an overview of the discussion of the qualitative study. It also provides a discussion of the results of the Discrete Choice Experiment DCE used to obtain preferences on the attributes women find important when choosing the place of delivery. A discussion on the sociodemographic and maternal health utilization with that influence the attributes that drive preferences. A discussion was also presented on the trade-offs that women make when making a choice of the different attributes for place of delivery and including their trade-offs with the costs of delivery that is presented as willingness-to-pay estimates. The conceptual framework presented in Chapter 2 which was based on two previous conceptual frameworks: Bohren et al.'s conceptual framework (2014) and the WHO quality of care framework for improving maternal and newborn health (WHO, 2016) that help to explain the findings. A summary of the study limitations are also addressed in the chapter.

5.2 Discussion of Qualitative Findings

The qualitative study identified the factors which could influence the choice of delivery location in a peri-urban setting and rural setting. The women at both sites are citizens of the lowest quintile of income from areas marked by high maternal mortality rates in Kenya. The themes were analyzed and compared to those identified using Bohren et al.'s (2014) conceptual framework, which is based on the multi-level life course. This framework reviews facilitators and barriers to facility-based delivery in LMICs using evidence from qualitative studies (Bohren et al. 2014). It explores how individuals' earlier life experiences impact their decisions and actions concerning facility-based delivery. It also explains how these decisions vary based on impacts of people, families, cultures and nationalities. Bohren et al. (2014) describe four main themes, namely: perceptions of pregnancy and childbirth (in the pre-conception phase), availability and access of services, impact of socio-cultural background and care experiences on decision-making, and perceptions of care quality. In both settings discussed below, this analysis used the conceptual framework described in Figure 2.1 in Chapter 2 to define three specific themes associated with Bohren's conceptual context.

5.2.1. Perceived Quality of Delivery Care received at Health Facilities.

Across both settings, the theme that most resonated with women was the perceived standard of care delivery provided at the health facilities. People also claimed that private health facilities (both for-profit and non-profit) are suppliers of higher quality care. However, despite the perception of poor-quality services at public health facilities, there seemed to be a marked increase in the utilization of public health facilities for delivery services in both settings, as evidenced by the quantitative surveys. About 75% of rural and 69% of peri-urban women delivered at a health facility classified as public.

An increase in demand for delivery services related to policy change on user fees has been confirmed by recent evidence evaluating health facilities (Gitobu et al., 2018); a longitudinal study focused on urban settings in Kenya (Calhoun et al., 2018); and a study looking at the impact of removal of user fees across ten sub-Saharan African countries (McKinnon et al., 2015). This increase in demand due to the removal of user fees may have led to the further deterioration of quality of care, with understaffed public health workers having increased workloads as experienced in various health facilities across settings in Kenya (Karanja et al., 2018; Lang'at & Mwanri, 2019; Tama et al., 2018). Evidence from Kenya and other sub-Saharan contexts has shown that an increase in demand at health facilities due to removal of user fees might not necessarily lead to an improvement in maternal health and other outcomes (Gitobu et al., 2018; (Dzakpasu, Powell-Jackson, and Campbell, 2014; De-Allegri et al., 2015).

In both study settings, the perceived quality of care resulted in the women opting to switch seeking services from primary health facilities, such as health centers and dispensaries that were geographically close to them, to tertiary health facilities, often further off in town centers as shown with the positive coefficient that signified preference for longer distances. This phenomenon of bypassing close-by health facilities in the search for health facilities providing a higher quality of care has been previously documented in Tanzanian settings, where women deemed primary health facilities ineffectual for complex obstetric services (Kruk et al., 2014).

Most of the barriers to delivery at public health facilities were related to the perceived poor quality of clinical care. Women described unnecessary caesarean sections because of the availability of the equipment. They described situations where no consent was obtained regarding the procedures and overmedicalisation of the process of childbirth, a finding that has been described in several contexts in a systematic review (Bohren et al., 2014; Miller et al., 2016). A few women described having been attended to by trainee doctors, particularly at tertiary teaching institutions, a situation that exacerbated the already low quality of care described. Safety concerns such as theft of newborns at tertiary health facilities were described at tertiary health facilities. There were concerns about incompetent systems with basic and affordable facility items, such as cleanliness in the facility, hot water for showering, curtains for privacy and food after delivery, which are missing elements of a competent health system. These standards of care demonstrate experiences of care that are contrary to WHO standards for a high-quality health system that recommends the health system should have components such as safety effectiveness, equity (World Health Organization, 2016).

In both settings of the study, three important sub-themes were established, categorized under expectations of quality of care. Women considered the following important when selecting a place of delivery: a) availability at the health facility of physical facilities, b) interpersonal care at the health facility, and c) availability of referral services at the health facility. These findings concur with the recent literature, specifically systematic reviews of qualitative studies assessing the facilitators and barriers of facility-based delivery in developing country settings (Gabrysch and Campbell, 2009; Bohren et al., 2014; and Moyer and Mustafa, 2013).

a) The availability of physical amenities at the health facility

The availability of physical amenities at the health facility was commonly mentioned by the rural women. Women would “opt for quality” by choosing a health facility that had the equipment and ability to provide cesarean sections in the event of a complicated birth. The women also mentioned that they wanted a health facility that would have equipment for dealing with complications in newborns such as neonatal resuscitation equipment and incubators. The information was often obtained by word of mouth from a relational network of other women who had used the health facilities. Physical amenities mentioned in both settings include adequate space in the wards, suitable beds, and bedding, availability of hot water for bathing and sufficient food for eating after delivery. Other Kenyan studies identify the same trend in different Kenyan settings, such as peri-urban and pastoralist communities and coastal Kenya, where women have mentioned a shortage of essential physical amenities at health facilities (Karanja et al., 2018; Langat & Mwanri, 2015). These findings have been reflected in other sub-Saharan counties, particularly in rural settings (Gebrehiwot et al., 2014; Anastasi et al., 2015; King, Jackson, Ditch, and Haile Mariam, 2015) The following features of availability of physical amenities were reported to be important:

Availability of medical equipment and supplies at health facilities. The presence of physical amenities at the major maternity hospitals influenced women's choice of place of delivery. This was explicitly attributed to the presence of a functioning theatre and resuscitation equipment for newborns, which bestowed them an ability to handle obstetric complications. This has subsequently led women to choosing public health facilities over private health facilities. This finding should be taken with caution, though recent studies in Kenya have described the availability of emergency equipment might not necessarily lead to quality delivery at some health facilities (Echoka et al., 2014). This might be due to the functionality of the equipment, and the provision of life-saving services might depend on other factors such as staffing. The second facilitator was the process of early screening for complications during ANC services that allowed women referred for delivery at maternity with specialized staff. They mentioned that this allowed them to choose higher level maternities that could handle complications. Most of the barriers to delivery at public health facilities were related to the perceived poor quality of care at public health facilities. Women described unnecessary caesarean sections because of the availability of the equipment. They described situations where no consent was obtained regarding the procedures and overmedicalisation of the process of childbirth, a finding that has been described in several contexts in a systematic review. (Bohren et al., 2014). A few women described having been attended to by trainee doctors, particularly at tertiary teaching institutions, a situation that exacerbated the already low quality of care described

Health facility cleanliness. This attribute was mentioned exclusively by the women in peri-urban settings have named the health facility's cleanliness as the most coveted quality under the theme of physical amenities; indicating that comparatively less costly measures such as facility hygiene will improve professional attendant deliveries in these settings. Yet, studies have shown hygiene to be poor across facilities in informal settlements (Bazant and Koenig, 2009). Cleanliness was mentioned universally as a prime concern in all the focus group discussions conducted within the peri-urban setting. Women highly valued cleanliness and described the lack of sanitation in various form: the presence of blood, dirty bed sheets, medical waste, dirty toilets, and dirty bathrooms. They noted that a dirty health facility would influence their choice of place of delivery. They also described wanting to give birth in health facilities with flowing water to maintain standards of hygiene. Cleanliness seems to be a low-cost standard that can be easily upheld by health facilities and policymakers to allow women to have a higher-quality birth experience. In particular, county governments need to ensure cleanliness is taken seriously at public health facilities. The Kenya Quality Model for Health (KQMH), the Kenyan government's quality management framework, emphasizes hygiene as a primary intervention across facilities (Ministry of Health, 2014). Poor hygiene may cause users to avoid a facility and travel longer distances for care, which can cause delays and worsen maternal indicators. Such behavior has been documented in Tanzania for instance (Kruk et al., 2010). Cleanliness has also been identified as an important attribute in Ethiopia and in Zambia (Kruk et al., 2009; Hanson et al. 2010).

Safety and security of newborns. Another aspect of the quality under the physical amenities mentioned exclusively by peri-urban women was the safety of newborns and security around neonatal units. Only the peri-urban women cited this finding, and it was directed towards larger secondary maternity hospitals. Technical solutions like digital cameras can be used to monitor maternity wards, particularly at the nurseries. Additionally, there should be restricted access to sensitive areas such as nurseries. The safety and security of newborns should be part of Kenya's quality model for health modeled upon the WHO standards for quality of care.

b) Interpersonal treatment of women at the health facility

As part of perceptions of quality of care, a majority of the women mentioned process indicators, such as the interpersonal treatment of women by healthcare workers. Private health facilities within both settings were described as providing a high quality of care with healthcare workers who were described as respectful and caring towards the women. Public health facilities, on the other hand, were described as mistreating women and being disrespectful and abusive in their interactions with women. Our findings suggested that women were concerned, and in both settings, identified nurses as critical healthcare providers, holding them responsible for varying modes of mistreatment. The rural women specifically identified night-shift nurses as having a bad attitude towards them and attending to them in disrespectful ways. Forms of mistreatment often included verbal abuse, neglect, and abandonment during delivery and denying them personal autonomy in the choice of their preferred delivery positions.

Quality of care standards require that women be treated in a respectful manner and in a way that upholds their dignity (WHO, 2016). Mistreatment at health facilities by healthcare workers is a topic that is gaining traction and has been described in many different contexts, particularly in sub-Saharan Africa. Like Bohren et al. (2014), we identify mistreatment and abuse by healthcare workers in both settings. Mistreatment has increasingly been recognized as a barrier to women taking advantage of facility-based delivery. It is described in detail within the Kenyan context, with some studies putting its prevalence at 20% (Abuya et al., 2015). Other studies have documented the manifestations of mistreatment (Okwako & Symon, 2014; Warren, Njue, Ndwiga, and Abuya, 2017; Oluoch-Aridi et al., 2018). This has been reported in diverse settings within sub-Saharan African such as Guinea (Balde et al., 2017), Nigeria (Bohren et al., 2017), and South Africa (Jewkes, Abrahams, & Mvo, 1999).

Urgent international calls have been made for accountability for the mistreatment of women during labor and delivery (Bohren et al., 2019; Afulani & Moyer, 2019). Mistreatment should be addressed during regular supervision in all facilities, and quality assessments should ensure that a functioning feedback mechanism for respectful care during delivery is in place. Policymakers and program managers need to take note and work on solutions to improve the quality of care that women face at maternal health facilities. Professional associations also need to be involved in continuing professional development to change norms. Other health policy researchers have suggested retraining health workers and including a value transformation component to promote respectful care during delivery services (Warren et al., 2017).

c) The availability of adequate referral services

The availability of referral services was significant, particularly in the peri-urban environment, where women tended to patronize private health care facilities at low cost. This has been seen in other studies set in informal settlements (Bazant et. al., 2009). Women reported they were often subjected to referrals to the same public tertiary health maternities that they wanted to avoid in their choice of a private health facility. Referrals struggled with delays because of the lack of ambulances, poor communication or weak linkages with higher-level facilities that were part of the system. This finding suggests that referral options at some low-cost private health facilities within peri-urban settings are weak. WHO standards advocate for referrals that are conducted in a timely fashion with a pre-established plan for delivery care and with relevant sharing of information between the concerned staff at the private health facilities (WHO, 2016).

5.2.2. Resource Availability and Access

Following Bohren et al.'s framework (2014), this study identified two sub-themes: - costs and transportation- as important

Costs. The peri-urban women mentioned costs associated with delivery service. Their concerns about costs were related to the financing modes accessible to them and the type of health facilities. Private health facilities and mission facilities were more expensive compared to the "free" public health facilities. The peri-urban women described difficulty meeting direct costs, such as the delivery fee, doctor's fee, and separate fees for drugs. They expressed frustration with paying costs, especially in the event of an emergency. Some of them described the employment of their spouses (the main earners) as being precarious. Despite having access to the National Health Insurance Fund (NHIF), public health insurance, women in both settings reported that the coverage for free maternity care included only a 24 hours stay for a normal, uncomplicated vaginal delivery. This coverage excluded any maternal and neonatal complications which would lengthen stay. The women reported that this uncertainty put them at financial risk and influenced their choice of facilities. Policy initiatives to clarify the coverage of (NHIF) and free maternity services are needed.

The rural women also had concerns around costs. Women described situations where public health facilities were "free," but they were exposed to hidden and indirect costs during billing. Women were asked to pay extra fees at the point of discharge. Costs, both direct and indirect, have been previously identified in studies assessing factors influencing place of delivery both in Kenya and other sub-Saharan African settings (Karanja et al., 2018; Mwangome et al., 2012). Additionally, some of the women described the quality of care at some of the public health facilities as deficient. They made the trade-off to seek delivery care at private health facilities, albeit with higher charges, to safeguard their health and that of their babies by receiving services that they perceived as being of high quality.

Transportation. The sub-theme of transportation is closely related to the distance to the health facility. Distance to the health facility has been identified in other studies examining factors influencing place of delivery in Kenya and different sub-Saharan African settings (Karanja et al., 2018; Anastasia et al., 2015). The study's qualitative findings suggest that geographical access still presents a significant challenge, particularly for some sub-groups rural women. The Naivasha sub-County study setting included women who hailed from pastoralist backgrounds, and the distances to a health facility were vast. Pastoralist women in Kenya continue to face long distances to care, posing a significant barrier and a threat related to obstetric emergencies, as seen in other studies (Caulfield et al., 2016; Byrne et al., 2016). Some studies suggest construction of maternity waiting homes as a solution to distance, especially in pastoralist communities, but cultural resistance continues to be a challenge to the uptake of such interventions (Karanja et al., 2018). Support for obstetric emergencies and functioning ambulances have been proposed as another solution to such challenges.

However the quantitative findings were conflicting and showed that women from both the rural and peri-urban setting had a preference for long distances. This implied that they were bypassing primary health facilities that were closer to their residences to access care at health facilities at further off secondary and tertiary health facilities at city centers.

5.2.3 Sociocultural Context and Care Experiences

This study showed that in the peri-urban setting, younger women seeking delivery services were routinely discriminated against and stigmatized at health facilities. The health workers would often use the excuse of asking them for 'clinic cards' (antenatal care service cards). They often received delayed admissions during labor or were sent back to deliver in the facilities where they had done their ANC clinics, even during active labor. This finding has been reported in other studies in Kenya (Oluoch-Aridi et al., 2018). Stigmatization and discrimination based on age and or marital status needs to be addressed. Policies to safeguard young women's healthcare rights should include admission and delivery irrespective of where (or if) they received antenatal care services and could significantly reduce the risk of complications that come with delayed service.

5.3. Discussion of the Quantitative Findings

The key finding from the DCE was that all the attributes had an impact on the probability of choosing a health facility for delivery over a home delivery. To our knowledge, this is the first report of using DCE to address maternal health both in a peri-urban setting and a rural setting. Previous DCE studies in sub-Saharan Africa, such as those done in Zambia, Tanzania, and

Ethiopia, were conducted only in rural settings (Hanson et al. 2005; Kruk et al 2009; Kruk et al. 2010).

The rural women in this study valued the attitude of healthcare workers above all other attributes. In contrast, in the peri-urban setting the most valued attribute was the cleanliness of the health facility. In both settings, the women's choices indicate their preferences for both structural and process aspects of quality of care (WHO, 2016). The peri-urban women ranked facility cleanliness highest regarding quality of care. The women described how much they valued cleanliness by stating that they would switch health facilities if they found the first had dirty and unhygienic conditions. Cleanliness has been identified as necessary in studies in rural settings in Ethiopia (Kruk et al., 2010a). On the other hand, Kenyan rural women ranked healthcare workers' attitudes as the most valued attribute, while the peri-urban women ranked this attribute third. Several studies conducted in Kenya also reported that the attitude of healthcare workers, including elements of mistreatment during facility-based delivery as a big and growing challenge (Okwako and Symons 2014; Warren et al 2010; Abuya et al., 2017 Oluoch-Aridi et al., 2018).

Similar studies in rural settings in Ethiopia and Tanzania have also identified attitude of healthcare workers as a health-system factor that women find important when choosing a place of delivery (Kruk et al., 2009; Kruk et al., 2010; Larson et al., 2010). This finding has also been reflected in other studies in rural settings in sub-Saharan African, as in an earlier study assessing patient's preferences for hospital services in Zambia (Hanson et al., 2005). A systematic review focused on studies conducted in low and middle-income settings synthesizing qualitative literature have primarily acknowledged that the attitude of health workers managing women during labor and delivery presents a huge challenge for quality delivery services (Bohren et al., 2014).

In the rural setting, the second most valued attribute was the availability of medical equipment and supplies at the health facility. This was expressed by women specifically identifying equipment necessary for dealing with emergencies, such as a theatre for caesarean sections and neonatal resuscitation equipment for their babies as being important attributes. Studies evaluating the state of obstetric care coverage often compare the provision of care to the physical infrastructure available without assessing the care provided at health facilities. For example, a recent study that evaluated emergency obstetric services (EMOC) across health facilities in rural Kenya found that EMOC capabilities were not being met. In fact, only two of the five health centers assessed had acceptable EMOC capabilities (Echoka et al., 2013). Additionally, recent assessments of quality of care at Kenyan health facilities have shown that medical equipment and drug supplies for mothers were only available at 69% of public health facilities and 41% of health facilities (both public and private) (Chen et al., 2014).

An unexpected finding was the coefficient of the cost attribute had a positive sign, signifying a utility for higher costs across both settings. This finding suggests that the women in the peri-urban setting were willing to pay higher amounts of money for delivery services as a trade-off for obtaining services that they perceived as being of higher quality. This finding is important given that a majority of peri-urban women (77%) did not have any health insurance coverage of any type. This implies that the women would have to pay for the delivery service using out-of-pocket funds. Such payments have been associated with putting patients at significant financial risk. For the rural setting this finding suggests women may have aspirations for higher quality care and may hence be signally their value for this kind of care in the hypothetical exercise. This finding was supported by the high willingness to pay estimates for this setting.

One of the objectives of the quantitative study was to answer question four: which was to identify sociodemographic and maternal health utilization variables and interact them with the selected attributes to explore how preferences are driven by women's characteristics. The quantitative study also addressed question five which was to assess trade-offs that women made between the attributes and understand the willingness-to-pay for delivery services. In order to better understand how sociodemographic and maternal health utilization variables might drive the choice of attributes we ran a mixed multinomial logit model to examine interactions. We interacted the selected attributes with sociodemographic variables of age, marital status secondary education, and main earner status. We found statistically significant interactions for younger single women with secondary education who were main earners had strong preferences for clean health facilities. These findings suggest that these women's expectations for quality of care especially with regard to observable attributes is increasing and policy makers need to focus on these attributes. It is noteworthy that informal settlements are increasingly been populated by secondary educated women who have expectations for higher quality delivery services. Policy makers need to respond by targeting interventions that include keeping especially public health facilities clean and hygienic.

As expected older married women with a secondary education on the other hand preference for health facilities with equipment and drug supplies available as well as health workers with a kind attitude and good quality care by health care workers. A majority of the women in both samples had secondary education (83%) and (88%) for rural and peri-urban respectively. The preference is consistent with local literature and other low-income countries, with secondary educated women preferring to delivery in health facilities that signal high quality. (Mwangi et al., 2018; Nyongesa et al., 2018; Chea et al., 2018; Gitonga & Muiruri, 2016; Kinuthia et al., 2015; Kitui, Lewis, & Davey., 2013). Older women also have more experience with the health care system and can draw on their social connection to provide them with insights regarding the facilities at a health facility (Moyer et al 2013).

Attributes such as distance that have been reported as important attributes in certain contexts. Distance was positively and statistically significant association with choice of place of delivery. These findings imply that women in both settings had a preference for bypassing close by smaller health facilities and travelling long distances to access health facilities. This finding has been identified in other studies in Tanzania where a similar phenomenon of bypassing primary health facilities was examined (Kruk et al 2014).

The estimated mixed logit model showed significant standard deviations for the attribute on attitude of healthcare workers, indicating preference heterogeneity in both settings. This implies that there is significant variation within the study population with individual respondents' preferences deviating markedly from the average trend. Married women with secondary education who reported been main earners were the main characteristics that drove this preference. Our results concur with findings from qualitative work that demonstrate because of the power imbalances present in these low-resource setting, women in low –income settings such as where our study was conducted are often subjected to mistreatment by healthcare workers (Jewkes et al.,1998; Bradley et al.,2016). Other DCE studies in rural settings in Africa have identified the attitude of healthcare workers as a health system factor that women find important (Kruk et al., 2009; Kruk et al., 2010a). Studies assessing patients' preferences for hospital services in Zambia also highly valued the kindness of healthcare workers (Hanson et al., 2005).

We assessed the trade-offs that the women made between delivery costs and attributes, using a marginal rates of substitution. We found out that women in the peri-urban setting strongly valued a clean health facility for delivery and were willing to give-up a health facility with good quality of clinical care for one that is clean. This reinforces the findings of other researchers such as Bazant et. al. (2009) that conducted research in informal settlements in Nairobi and reported that women were unsatisfied with delivery at health facilities that they deemed unclean and unhygienic.

Women on the other hand valued the availability of medical equipment and drug supplies and were willing to give up health facilities with good quality clinical care for one that had medical equipment. This was corroborated by the qualitative study in the rural setting whereby women mentioned that they would prefer to deliver at the tertiary health facility at the sub-county city as opposed to the primary health facilities closer to them because they would want to delivery in a health facility with the capacity to handle obstetric complications with equipment such as a theatre for cesarean sections. This finding is consistent with other assessments that have proven that women in Kenya in rural areas and other parts of Kenya receive poor quality care (Sharma et. al. 2017; Arsenault and Kruk, 2019) and primary public health facilities often have poorer access to equipment and have only 69% of the equipment required to provide services. (Dutta et al. 2014)

The results from this study indicated that the peri-urban women were willing to pay roughly 6,900Ksh (the highest amount) for a clean health facility (the most valued attribute). This amount is slightly higher than the average cost of delivery at private health facilities in this setting 5000Ksh, illustrating how critical a clean health facility was to women's preferences for the characteristics of a delivery health facility. This finding implies that policymakers should focus on initiatives that are low-cost but have a high impact on women's choices for quality health services, such as ensuring health facilities are clean and hygienic. However, caution needs to be taken while interpreting women's preferences. While preferences are important, they are not in and of themselves as assessment of the type of quality that will drive decreases in maternal and neonatal mortality. In its recent report, the Lancet Global Health Commission on High Quality Health Systems (Kruk et.al. 2018) warns that despite having inputs such as clean water, these inputs might not necessarily lead to high-quality health systems.

Women from the rural setting were willing to pay roughly Ksh. 36,223 for a health facility with a kind and supportive health care worker. This amount is significantly higher than the cost of most public health facilities and private health facilities providing delivery services in the rural setting where we conducted our study. But this amount might signal that women may bypass closer health facilities and seek delivery services at health facilities that are further off in cities such as Nairobi to access higher quality care that is associated with a higher cost. Reports of women bypassing closer health facilities to access care at further off health facilities have been reported in the literature previously (Kruk et al., 2010).

5.4 Strengths and Limitations of the Study

The sequential mixed methodology is a strength of this research study. Data from two both a qualitative study and a quantitative survey were used. The use of the qualitative study enabled the identifying both conceptual and contextual attributes that are important to women's decision for place of delivery (Oluoch-Aridi et al., 2020). This study utilized qualitative work in context as well as literature review for attribute development (Coast et al. 2012; Vass et al 2017). This was to ensure optimal selection of contextually relevant attributes and attribute. The literature review facilitated access to conceptual attributes that have been reported in other studies as influencing place of delivery. The qualitative study clarified context specific attributes for both settings where the study was undertaken. The qualitative study was done in Kiswahili or other vernacular languages spoken by the women in the rural setting that allowed an accurate attribute specification. The study design also included debrief sessions with women, healthcare providers as well as policy makers.

The use of the quantitative survey allowed an understanding of sociodemographic variables related to women's health behavior and decision making around choice of place of delivery. The quantitative study was cross-sectional nature in which the data is collected at a single point in time has several advantages. The data on all variables were collected all at once and it allows for descriptive analyses that can generate hypotheses. The interactions with the women's sociodemographic variables were able to give us useful context specific information on attribute variation based on sociodemographic variables previously identified as predictors of place of delivery.

The main strength in the use of a DCE is that it allows respondents to make trade-offs thereby revealing their hierarchy of preferences and quantifying them. This information can be useful for policy makers who have scarce resources in low-income settings to guide decisions on where to make investments aimed at improving the quality of maternal health care services. Hence

DCE's provide policy relevant information. DCEs also use econometric modeling techniques to compute the expected effects of policies and can provide scenarios that can provide estimation tools to approximate the relative cost effectiveness of certain attributes in specific contexts. Discriminate validity was examined using Pearson Product Moment correlations and there was no significant correlation. This finding together with good comprehension in the pilot demonstrated adequate specification of attributes

There are some methodological limitations of the study. Some of relevant attributes such as type of health facility identified by the qualitative study were omitted to allow a reduced number of attributes to allow fitting of the econometric model. The qualitative phase of the study included focus group discussions that were conducted with women from a wide range of ages, and from a broad mix of health facilities. These facilities represented the full range of options, from private, low-cost health facilities to private mission health facilities to public health facilities (both health centers and maternities). These two sub-counties may not sufficiently represent the perspectives of women outside the rural and peri-urban context in Kenya, but these they do represent a range of relevant contexts important in the changing dynamics of Kenya. Another limitation was failing to interview women who delivered at home or with the assistance of traditional birth attendants. However, the issue of home delivery is reducing substantially in the contexts where the study took place. I also did not interview women who delivered at low-cost, unregulated health facilities. The addition of these diverse voices would have provided additional insights about how women choose place of delivery. Also while analyzing the data the study did not go into in depth analysis using conceptual frameworks such as the health belief model (Rosenstock et al. 1974) that might have assisted in explaining the women's decision making behavior regarding choice of place of delivery.

The quantitative study had some limitations in that cross-sectional data cannot lead to inferences on causation but rather can only lead to inferences on associations which may sometimes be difficult to interpret. Cross-sectional data is also susceptible to biases such as respondent, recall and social acceptability bias that can lead to misleading results. The use of DCE's for instance, the rigor of experimental designs used by studies in the health economics literature needs to be strong. If the experimental designs are weak, it might lead to flaws due to inappropriately constructed designs (Lagarde and Blauw, 2009). Additionally, the hypothetical nature of DCE’s might lead to respondents in low income settings with low educational backgrounds misunderstanding the goals of the experiment and not making any trade-offs between attributes and attribute levels. The main limitation of the DCE survey was that we did not include holdout questions; consequently, we were unable to test the predictive validity of the DCE. However, this was mitigated by calculating the willingness-to-pay measures that informed us about women's value trade-offs between the attributes and the cost of delivery service.

Lastly, while recommendations argue that observational studies where the actual quality of care delivered at health facilities should be conducted to get the most accurate representation an observation study was not conducted in this setting because of the logistics and short time frame that was available for the study. These studies have also been reported to be susceptible to the Hawthorne effect that indicates that when people are under observation for research purposes their behavior is often different from their behavior in more natural settings.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents section 6.2 that summarizes key conclusions drawn from this study. It also provides a section 6.3 that outlines a set of recommendations to policymakers on how to improve women's experiences of quality of maternity care received at health facilities. It also summarizes the contributions of this study to the body of knowledge, and implications for further research in this topic.

6.2 Conclusions

This study established that women perceive the quality of care at most public health facilities as poor and some private health facilities particularly in the peri-urban setting. Poor-quality care is known to be associated with increased maternal morbidity and mortality. Efforts need to be made to improve the quality of care at public health facilities, at both primary health centers, and secondary health facilities. These efforts should also focus on low-cost private health facilities within peri-urban settings. These improvements should follow standards that have previously been established by reputable organizations, such as the WHO standards on improving the quality of facility-based care of mothers and newborns. The document presents eight domains of quality of care with accompanying standards that provide suggestions for improving the quality of care (WHO, 2016).

The recent increase in demand for utilization of public health facilities that accompanied the free maternity services policy in Kenya needs to be managed because it puts a stress on the existing health system, which is ill-prepared to absorb the new patients given the low numbers of healthcare workers and events such as strikes. The health system needs to find creative ways of getting sufficient human resources to handle the surge in women seeking facility-based care. Upstream strategies such as use of locum doctors or temporary contract nurses can be tried. Innovative programs that deploy health workers to rural areas have been suggested with an increasing number of health workers needed to establish good health outcomes for women (Blaauw et al., 2010).

This study established that the most valued attribute in the peri-urban setting was the cleanliness of a health facility. Young educated women who were main earners described it as a factor that would make them switch health facilities for their deliveries and were willing to pay the highest amount to deliver in a clean health facility. Cleanliness and hygiene is a low-cost strategy that should be part of public health facility standards for quality according to the Kenya Model for Quality Health. The WHO standards for quality care for mothers and newborns in health facilities recommend a physical environment that has adequate water, sanitation, energy, supplies, and medicines find most important hence policymakers at the county and national level need to take into account low-cost interventions such as maintaining hygiene and cleanliness particularly of public health facilities.

This study also found out that attitude of health care workers was ranked highest by women in the rural women and second by the peri-urban women reinforcing the fact that it remains a growing challenge within the health system and this suggests that manifestations of mistreatment, disrespect, and abuse have been on the rise in delivery care in Kenya needs to be curbed. Strategies such as transformational training that address the attitude of health care workers have been previously suggested by Warren et al. (2017) as a way of mitigating interactions between health care workers and women which might be described as undignified. These trainings should target health care workers and the content should focus the materials on how to interact with a certain demographic of women whose expectations for quality care may be high. As facility-based deliveries rise in both public and private health facilities, and as women's sociodemographic profiles change as they become more educated, women's expectations of the quality of care are changing hence respectful care during maternity should be a cornerstone of patient-centered maternity care. Public health facilities in particular need to put in place strategies to ensure that respectful treatment is the norm rather than the exception. Focusing on ensuring human rights approaches that promote patient-centered care is especially important for women from lower socioeconomic groups who are often subject to mistreatment because of their status as well as social and gender norms that promote their mistreatment. A recent study by Bohren et al., (2019) showed that physical and verbal abuse peaked 30 minutes before birth until 15 minutes after birth, underscoring the importance of different methodologies for capturing the real experiences women face during childbirth within health facilities. Urgent calls have been made to curb the mistreatment of women during facility-based delivery and promote the accountability of healthcare workers for respectful care (Bohren et al., 2019; Afulani et al., 2019).

Physical amenities such as the availability of water and good food should be essential elements present especially at public health facilities. The availability of physical amenities in the form of medical equipment for cesarean sections such as theatres and neonatal complication management was highly valued by women in both settings. It is critical for health facilities to signal quality of care by having this essential equipment. The consequence of the lack of this equipment is the phenomenon of "bypassing" that sees women overcome geographical distance and move away from health facilities that are close to them to travel to deliver at a further-away facility, as the evidence suggested in the rural settings (Kruk et al., 2009). To overcome this trend, county governments need to invest in equipping these primary level health centers and have the necessary skilled staff at these levels. The safety and security of newborns were mentioned exclusively in the peri-urban setting. It is critical for larger secondary and tertiary maternities to safeguard the security of newborns. A health system should provide care that is deemed safe. (WHO, 2016). Technical solutions like digital cameras can be used to monitor maternity wards, particularly at the nurseries. Additionally, there should be restricted access to sensitive areas such as nurseries. The safety and security of newborns should be part of Kenya's quality model for health modeled upon the WHO standards for quality of care.

Financial access to delivery services increased in both settings with the free maternity policy that allows women to access health facilities, including private ones, with NHIF coverage. However, the women also described poor quality of services associated with free delivery and were willing to pay to receive better-quality services. Peri-urban women with the lowest coverage in terms of health insurance were ready to pay for better quality delivery services implying that more effort is needed to put in place policies to protect people from out-of-pocket payments and financial ruin when they make the trade-off for better quality services. Several challenges were described in the implementation of free maternity services policy (Lagat & Mwanri, 2015; Gitobu et al., 2018; Tama et al., 2018). Additionally, women were concerned about paying for complications beyond the 24-hour normal vaginal delivery covered by insurance. The evidence points to costs of delivery services not being a significant barrier to facility-based delivery. However, there are concerns that the free maternity services are providing low-quality delivery services and might jeopardize sustainability in the long-run. Policymakers, therefore, need to ensure the quality of care provided particularly at public maternity health centers is still sustained despite the maternal health services being free. This would reduce the practice of bypass of smaller primary health facilities that are perceived to be providing poor quality services. Additionally, the free maternity service policy was not clear on the implications of stays beyond the normal delivery, especially for women with comorbidities such as hypertension and diabetes that would require longer stays. The free maternity policy needs to provide clear instructions on the full coverage for beds and additional services so women can better prepare. In the rural setting, there were complaints about billing for extra services under the “free” maternity. The billing procedures should also be clear on what is covered under the free maternity. All these out-of-pocket expenses for delivery services put women at significant financial risk and need to be addressed. Proper costing out deliveries for women of different risk profiles is essential for understanding how to attain universal health coverage for mothers in low-resource settings.

Distance and transportation to health facilities still continue to plague some sub-groups of women such as pastoralist women in rural settings, and then there is the need to finance a reliable referral system. Women in pastoralist settings within this study had difficulty accessing the sub-county hospitals for referrals in the case of complications hence having the second delay of reaching the health facility that Thaddeus and Maine (1994) describe in their seminal article. Efforts to ensure ambulances or waiting homes for such women would go a long way in ensuring they get timely care. Policy may build on this observation to push for quality improvement particularly at primary healthcare facilities that are close to women. Distance particularly for some women in rural areas that are part of a semi-nomadic context still presents a significant challenge and should be resolved using maternity waiting homes or other strategies such as prior arrangements with family. (Karanja et al 2008; Byrne et al., 2004; Caulfield et al., 2006).

Women reported untimely referrals in both the settings. The third WHO standard for high quality care for women and newborns recommends for referrals without delays to ensure good outcomes for both mothers and babies. Ambulances need to be available at primary health care smaller health facilities to ensure that women can access them when they need them, especially in the early mornings and at night. It is because of ineffective referrals that women have chosen to bypass primary health facilities that are closer to their residences and patronize the larger tertiary health facilities. This calls for the county government to invest and implement a 24-hour ambulance service to improve on referrals. This has been previously recommended by other authors that have studied comprehensive EmOC (Echoka et al., 2014).

The WHO standard calls for evidence-based care during pregnancy, childbirth, and the postpartum period (WHO 2016). In this study we established that women reported poor quality of clinical care such as monitoring of their labor, they were often told to go back home when in active labor. They also reported unnecessary procedures such as cesarean sections and episiotomies at some public health facilities. Care needs to follow the evidence, using clinical guidelines to provide necessary care to women and providing appropriate and timely care, especially to women during labor. This care is described in the literature as "too little too late" when care during labor is delayed and "too much too soon" when unnecessary medical interventions such as cesarean sections and episiotomies are conducted (Miller et al., 2016). Policymakers need to ensure health facilities abide by the clinical guidelines to ensure evidence-based care that is responsive to women's needs. Women with secondary education also seemed to be able to assess the clinical quality of delivery services in both settings. These findings suggest that women are obtaining information from friends and family regarding the quality of services. Previous studies in sub-Saharan Africa have suggested that there is a strong social context that underlies decisions regarding delivery services (Moyer et al., 2013).

This research contributes to the body of literature on assessing the quality of care for maternal health services. Several DCE studies have been conducted in sub-Saharan Africa in rural areas on different aspects of health care services. This is the first DCE that has been conducted in a peri-urban setting eliciting the preferences of women living in these locations and many such studies are needed to inform policy on maternal health. The DCE captured information on preferences for the characteristics of place of delivery that are related to both technical and process outcomes such as the presence of a clean health facility and the need for women to be treated with respect and dignity during delivery. It also provided a relative ranking of these characteristics, proving that end-users have a hierarchy of values and policymakers need to pay attention to the relative importance of these quality indicators. As countries increase in income status and more populations become educated, more research focusing on end-user's values and preferences will become critical. While policymakers have noble objectives of improving maternal health outcomes, the process that is utilized to undertake the provisions of care needs to be safeguarded. Respectful care that upholds the dignity of women is a prerequisite for high-quality services. DCE's have also been proven useful for new interventions that have not been tested. More research that focuses on end-users and provides a direct opportunity to inform new interventions such as the free maternity policy will be useful to policymakers in the long run.

Different methods of assessing the quality of care provided within the health system need to take into account the need to have a way of ranking the importance of different outcomes to end-users. While outcomes are important, being in settings where budgets are limited there needs to be a way of prioritizing what works best and how much it is valued by end-users. DCE's provides a means of assessing the quality of care that can allow prioritization. Future research should focus on capturing what end-users value and other non-health outcomes as these influence behavior of end-users of health facilities within the health system. Additional research needs to be done to document the quality of care that women receive at health facilities, including studies that include observations particularly during key periods of service delivery.

6.3 Policy recommendations

In conclusion, it is clear that despite the increase in coverage that has been witnessed since free maternity services launched in Kenya, challenges persist with the regard to the quality of care that women are receiving, especially at primary level public health facilities. The County Government that is currently in charge of health service delivery needs to improve the quality of delivery care at health facilities. The quality of care depends on the physical amenities at the health facility and the competent human resource available within the health system to manage high quality maternal health services. Hence it is critical for policymakers and program managers at the County level to improve the quality of care and thus end preventable maternal mortality.

Kenya's maternal mortality ratio continues to be high and reducing the maternal mortality to 70 per every 100,000 live births is one of the SDG goals. A deeper contextual understanding of strategies that can strengthen the health system should guide suggested interventions. Policy makers at the National level need to not only focus on producing good health outcomes but should also leave the end users satisfied with the processes used in delivering the care. This is highly dependent on a competent health workforce. A well-functioning health system improves the health status of the individuals and provides care that is considered safe, effective, equitable, timely and people-centered. While the free maternity service might have lifted the barrier of cost to women for delivery service the National Government needs to ensure that there is a guarantee for high quality care through opportunities such as the recent initiatives by H.E the president on Universal Health coverage. Process improvement initiatives can be tied into the UHC to ensure that the care provided is high quality and responsive to the needs of the end users.

This study established process indicators of quality of care being equally as important and valued similarly to technical indicators of quality of care. This suggests that policymakers need to focus their strategies not only on the provision of high-quality delivery care but additionally on the process of the delivery of care. Strategies that are low cost and impactful should be upheld by both County and National Government. Strategies such as maintaining hygiene and sanitation, providing security for newborns, and availing medical equipment and drug supplies will go a long way in providing and signaling quality. Most importantly, upholding respectful and dignified care by focusing on the domains such as effective communication and interpersonal treatment of patients by staff at health facilities is a significant determinant of whether the gains made in the utilization of facility-based maternal care will be maintained in the long run in reducing maternal mortality and promoting good maternal outcomes.

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APPENDIX A: PARTICIPANT INFORMATION SHEET AND CONSENT FORM

Kenyan women's preferences for place of delivery: a comparative study between Embakasi north and Naivasha sub-county

SECTION 1: INFORMATION SHEET: HEALTH PERSONNEL

Investigator: Jackline Akinyi Oluoch Aridi

Institutional affiliation: Institute of Healthcare Management, Strathmore Business School, Strathmore University

SECTION 2: INFORMATION SHEET: THE STUDY

2.1. What is the study and why is this study being carried out?

The objective of this research is to conduct a comparative study that assesses women's preferences for place of delivery in Embakasi North sub-County and Naivasha sub-County. This study aims to study health service characteristics that promote the utilization of facility-based delivery by the women utilizing the economic evaluation methodology of Discrete Choice Experiment (DCE) to elucidate the attributes that are important for women in preference for a place of delivery.

2.2. Do I have to take part?

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire to get information on your preferences for a place of delivery. If you are not able to answer all the questions successfully the first time, you may be asked to sit through another informational session after which you may be asked to answer the questions a second time. You are free to decline to take part in the study from this study at any time without giving any reasons.

2.3. Who is eligible to take part in this study?

Women who have delivered children in the past six months.

2.4. Who is not eligible to take part in this study?

Women who have not delivered any children before.

2.5: What will be taking part in this study require of me?

You will be approached by the Principal Investigator/ an enumerator and requested to take part in the study. If you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete.

2.6: Are there any risks or dangers in taking part in this study?

There are no risks in taking part in this study. All the information you provide will be treated as confidential and will not be used in any way without your express permission.

2.7: Are there any benefits of taking part in this study?

The information will be used to improve maternal health services in both Nakuru and Nairobi County.

2.8: What will happen to me if I refuse to take part in this study?

Participation in this study is entirely voluntary. Even if you decide to take part at first but later change your mind, you are free to withdraw at any time without explanation.

2.9: Who will have access to my information during this research?

All research records will be stored in securely locked cabinets. That information may be transcribed into our database but this will be sufficiently encrypted and password protected. Only the people who are closely concerned with this study will have access to your information. All your information will be kept confidential.

2.10: Who can I contact in case I have further questions?

You can contact me, Jackline Oluoch-Aridi, by e-mail joluocha@nd.edu or by phone (0715961081). You can also contact my supervisor, Prof. Gilbert K'okwaro, at the Strathmore Business School, Nairobi, or by e-mail gkokwaro@gmail.com or by phone (0722323651)

I ___________________________, have had the study explained to me. I have understood all that I have read and have had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage.

Please tick the boxes that apply to you;

Participation in the research study	
I AGREE to take part in this research	
I DO NOT AGREE to take part in this research	
Storage of information on the completed questionnaire	
I AGREE to have my completed questionnaire stored for future data analysis	
I DO NOT AGREE to have my completed questionnaire stored for future data analysis	

Participant's Name ________________________________ **Date:** ______________________

Participant's Signature

I _________________________ (Name of person taking consent) certify that I have followed the SOP for this study and have explained the study information to the study participant named above, and that she has understood the nature and the purpose of the study and consents to the participation in the study. She has been given opportunity to ask questions which have been answered satisfactorily.

Investigator's Name: ________________________________ **Date:** ____________________

APPENDIX B: FOCUS GROUP DISCUSSION AND INDEPTH INTERVIEWS GUIDE

Purpose of FGD

The purpose of this Focus Group Discussion is to try and understand where women residing within *Embakasi-North and Naivasha sub-County* deliver their babies and why they prefer these specific facilities. The study intends to specifically elucidate the following;

1) What women's preferences are with regard to place of delivery
2) Why they choose certain places or health facilities over the other
3) To determine attributes of the health system that they deem important
4) To determine possible attribute levels of the attributes identified

Logistical arrangements

I would like to go over a few logistical arrangements before we begin the interview: Thank you for joining me today. My name is Jackline Aridi and I am a PhD student registered at Strathmore University at the Institute of Healthcare Management at the Strathmore Business School in Nairobi. The interview will last approximately 30- 45 minutes. I have obtained Ethical clearance to conduct this research from Strathmore University's Institutional Review Board (IRB) and permission to conduct research within Nairobi and Nakuru County from the National Science and Technology Research Institute (NACOSTI)

Everything we discuss during this interview will be kept in strict confidence and your real name will not appear in any of our results. As such, please make every effort to be open and honest when responding to the questions. I will provide you with a consent form which you will read and sign if you find it agreeable with you. For data capture purposes, this interview will be recorded using a mobile phone device. Start tape recording if consent is granted: (Facilitator to switch recorder on)

FGD Discussion Questions

The questions fall into five key categories: Follow the guide below to lead the focus group discussion on the 5 key themes.

Key questions	Probes
1. Birthing Experience -What are the things that make for a good birthing experience?	Describe your dream birthing experience. Who needs to be present? What needs to be present? What are your worries or concerns? Are there cultural traditions that need to be followed judiciously? What makes you feel safe during the process? What would absolutely make it a bad experience?

2. Place of delivery -How did you and your family decide where to deliver?	What are the options for places to deliver? Who were involved in the decision making process as to where to deliver? Are you usually involved in deciding where to deliver? If so, what did you have to consider in making that decision? (cost, distance, risks, benefits) What makes the delivery place a good or bad experience? Were you treated nicely and with respect? Give examples.
3. Recommendation to friends- What would you tell your friends about where they should deliver and why?	Is it culturally appropriate to share your experiences with your friends? Does your opinion have an impact on where your pregnant friend delivers her baby? Does the Chief/leaders in your community recommend/suggest that you deliver at certain places? If you hear something negative about a place to deliver, does it affect where you choose to deliver?
4. Family Involvement -How did your family show support for you during pregnancy and delivery?	Is your husband and extended family usually involved in the birthing experience? Which family members are actively involved in delivery? What roles do they play in the delivery process?
5. Newborn Care -What are the things you believe make for the best environment for the newborn immediately after delivery?	What are the traditional customs on how to handle and care for newborns? Does anyone help you care for the newborn? What makes them qualifies to do so? What do you believe is the best way to feed your newborn? And the timeline to starting solid foods? How do you keep your newborn warm? Do siblings play a role in taking care of newborns? If so, as soon as when? And how?

Deriving Attribute Levels

Having delivered in health facilities and hospitals within Embakasi-North or Naivasha. Can you please speak on what you thought was the most important factors in selection of the facility where you choose to deliver. If I were to ask you to rank the list below, which of these factors did you think were most important in the selection of the health facility?

(Rank: Very important, somewhat Important, and Not important)

a. Cost of the health facility
b. Availability of drugs
c. Distance of the health facility
d. Health provider attitude
e. Quality of care (cleanliness etc.)
f. Whether or not abuse and disrespect occurs during the delivery
g. Time spent waiting for service
h. Cost of transportation

INDEPTH INTERVIEWS GUIDE

In-depth interview guide for healthcare workers at health facilities in Embakasi-North and Naivasha sub-counties

Purpose of the in-depth interview

The purpose of this Individual In-depth Interview is to try and understand where women residing within Embakasi North sub-County deliver their babies and why they prefer these specific facilities or places**.** The study intends to specifically elucidate the following;

1) What women's preferences are with regard to place of delivery
2) Why they choose certain places over the other places
3) To determine attributes of the health facilities that they deliver in and which of the attributes they deem important
4) Possible attribute levels of the attributes identified

Logistical arrangements

I would like to go over a few logistical arrangements before we begin the interview:

My names are Jackline Aridi and I am registered as a PhD student at Strathmore University's Institute of Healthcare Management. The interview will last approximately 30 minutes. I have obtained Ethical clearance to conduct this research from Strathmore University's Institutional Review Board and permission to conduct research within Nairobi County from the National Science and Technology Research Institute (NACOSTI)

Everything we discuss during this interview will be kept in strict confidence and your real name will not appear in any of our results. As such, please make every effort to be open and honest when responding to the questions. If at any time you feel uncomfortable and want to stop the interview, please feel free to. I will provide you with a consent form which you will read and sign if you find it agreeable with you. For data capture purposes, this interview will be recorded using a mobile phone device.

Sociodemographic characteristics of healthcare workers.

Characteristic	
Age in years	
20-29	
30-39	
40-49	
50+	
Marital Status	
Single	
Married	
Divorced /Widowed	
Years of Work Experience	
0-4	
5-9	
10-15	
15+	
Type of Health Facility	
Public Health Centre	
Private Health Centre	
Referral Hospital	
Maternity	
Other	

Questions with Healthcare workers and policy makers

Key questions	**Probes**
1. Birthing Experience- What are the things that make for a good birthing experience?	Describe your dream birthing experience. Who do you think needs to be present? What do you think needs to be present? What do you think are worries or concerns of the mothers? Are there cultural traditions that need to be followed judiciously? What makes a mother feel safe during the process? What would absolutely make it a bad experience?
2. Place to deliver- How did mothers and their families decide where to deliver?	**Facility staff** What are the hours of operation of the maternity ward? How many staff are working in your maternity ward? Is there electricity and water at your facility at all times? If not, explain Do you have a placenta pit? Are staff trained in: Newborn resuscitation? Emergency obstetric care? (placing IVs and dispensing Misoprostol for hemorrhage) Are your services completely free? Or do patients have to pay for some supplies (ex. gloves), use of an equipment, etc.? Is there periodic upgrade in capacity for maternity staff? When was the last upgrade and how many staff participated? Do you feel that mothers in your area deliver at your health center if available? If not, where do they deliver? Why?

	Are mothers treated nicely and with respect? Give examples. Who do you think is involved in the decision making process as to where a mother delivers? **Community leaders/Fathers:** What are the options for places to deliver? Who were involved in the decision making process as to where to deliver? Are you usually involved in deciding where to deliver? If so, what did you have to consider in making that decision? (cost, distance, risks, benefits) What makes the delivery place a good or bad experience? Were you treated nicely and with respect? Give examples
3. Recommendation to friends- What would you tell your friends about where they should deliver and why	Is it culturally appropriate to share your family's birthing experiences with your friends? Does your opinion have an impact on where your friends deliver their babies? Community leaders: Do you recommend/suggest pregnant mothers to deliver at certain places? Fathers: Does the Chief/leaders in your community recommend/suggest that your family deliver at certain places? Community leaders: If you hear something negative about a place to deliver, does it affect where you would recommend/suggest a family to deliver? Fathers: If you hear something negative about a place to deliver, does it affect where your family choose to deliver?

Attribute Level Development Questions

1. What do you think women accessing services from the health facilities where you work value most when they go to the facility for delivery?
2. What do you think is the most important characteristic of the health facility for women when they go to deliver?
   a. *Probe (cost of delivery services, distance to facility, equipment and supplies, attitude of healthcare worker, qualifications of health care workers)*

3. What do you think are barriers to health facilities from providing good quality delivery services?
    a. What do you think health facility in charges should do to promote good facility-based experiences for delivery services for women?
4. What is your opinion on the current free maternal health services policy under implementation since 2013? Is it encouraging utilization of health facilities for delivery services?
5. What do you think are the challenges that the Government and policy makers experiencing with respect to health policies concerned with delivery services in public health facilities? Private facilities? Tertiary facilities? And what should they do about the challenges?
6. What specific health policies do you think the Government should promote to improve access to high quality delivery services in public and private health facilities? Probe *(free ANC, increase access through NHIF, early focused ANC?)*

APPENDIX C. CODING FRAMEWORK FOR QUALITATIVE STUDY

Coding tree	Themes (from Bohren et al. 2014)	Sub-themes	Key findings
1.Birthing experience	1.1. Perceptions of pregnancy and	1.1.1. Traditional influences	**Theme: Presence of home deliveries in this setting** **Facilitator**: Some three women (two of them from the pastoralist settings) delivered at home. They mentioned that they did not perceive the need for a health facility delivery
		1.1.2. Medicalization of childbirth	**Barrier**: N/A
	1.2. Influence of sociocultural and care experiences	1.2.1. Influence of ANC	**Barrier:** Women who did not have the ANC clinic cards from public health facilities were barred from deliveries at the sub County hospital
		1.2.2. Previous birth experiences	**Barrier:** Multiparous women who had previously delivered at the sub County hospital and had bad experiences choose not to use the facilities based on their previous birth experience
		1.2.3. Influence of others on delivery location	**Facilitator & Barrier:** Women who had previously delivered in health facilities with good/bad services shared their experiences with others and influenced their decision on delivering at the sub County or primary health facility
		1.2.4. Ease of home births	**Barrier:** One of the three women who delivered at home in this setting claimed that because of her fast labor process she normally has a preference of home delivery
		1.2.5. Effects of policy	**Facilitator & Barrier:** The Free Maternity Policy in Kenya lead to many

			women delivering at the subCounty hospital and some women delivering at primary health facilities
2. Place of delivery	2.1. Resource availability and access	2.1.1. Transportation	**Barrier:** One of the women who delivered at home claimed that transportation to her primary health facility was difficult to access
		2.1.2. Cost of childbirth	**Facilitator**: Financial access to private health facilities
	2.2. Perceptions of quality of care	2.2.1. Perceived quality of care at facilities	**Facilitator and Barrier:** Interpersonal treatment at health facility was reported as both good and bad at both the sub County and primary health facility
			Facilitator: Availability of medical equipment for cesarean section at the sub County Hospital
			Barrier: Poor quality clinical services in some private low cost health facilities (private HF's)
			Barrier: Mistreatment of women during delivery (public HF's)
			Barrier: Inadequate staffing at the sub County Hospital
		2.2.2. Stigma	**N/A**

APPENDIX D: SOCIODEMOGRAPHIC AND MATERNAL HEALTH UTILISATION QUANTITATIVE SURVEY

Field	WOMEN'S HEALTH AND HOUSEHOLD QUESTIONAIRE
	DEMOGRAPHIC QUESTIONS
Age	1. What is your age?
Phone Number	2. What is your phone Number?
Residence	3. How long have you lived in Embakasi North/Naivasha sub county? A. I have lived here my whole life B. I just moved to Embakasi North/Naivasha C. Other
MovedWhen	4. How many years ago did you move here? A. 0-5 years B. 5-10 years C.11-20 years D. Over 20 years
ResidenceWhy	5. Why did you move to Embakasi North**?** A. I have family or friends here B. I heard there were business opportunities here C. To be close to Nairobi City Centre D. To look for work E. Other
Schooling	6. What is your level of education? A. Did not attend primary school B. Primary School C. Secondary School D. Tertiary E. University
Married	7. Are you married? A. No B. Yes
MarriedDuration	8. How long have you been married? A. 0-5 years B. 5-10 years C. 10-15 years D. 15-20 years
HOUSEHOLD MODULE	

HeadofHousehold(HoH)	9. Are you the head of the household? (If an important decision is to be made in the Household are you the one who gets to decide A. No B. Yes
Main Earner	10. Are you the main earner in your household? Do you contribute the most to household expenditures? A. No B. Yes
MainEarnerNo	11. How are you related to the person who earns most in your household? A. My Father/ My Husband/Boyfriend's father B. My grandfather/ My Husband/Boyfriend's grandfather C. My husband/Boyfriend D. My mother/My Husband/boyfriend's mother E. Another family member/ relative/ aunt/uncle
HoHMESame	12. Are the head of the household and the main earner the same person in your household? A. No B. Yes
Adults	13. How many people over the age of 18 live in your household?
adultswomen	14. How many of these are women?
adolescents	15. How many people aged between 14 and 18 live in the household
adolescentwomen	16. How many of these people are women?
Children	17. How many people under 13 live in your household?
childWomen	18. How many of these children are women?
employedadults	19. How many members of your household contributed to your household expenses last month? *(this includes things like rent, food, water, electricity fuel, cooking fuel)*
totalpublicexpenditure	20. How much did the employed adults contribute to your household expenses last month
	HOUSEHOLD ASSETS
Refrigerators	21. How many refrigerators does your household own?
Bicycles	22. How many bicycles does your household own?
Motorbikes	23. How many motorbikes does your household own?
Cars	24. How many cars does your household own?
Televisions	25. How many Televisions does your household own?
Radios	26. How many radios does your household own?
Stereos	27. How many stereos does your household own?
Mobiles	28. How many mobiles does your household own?
Mattresses	29. How many mattresses does your household own?
waterExp	30. How much did your household spend on water last month?
electricityExp	31. How much did your household spend on electricity last month?
fuelExp	32. How much did your household spend on fuel last month?

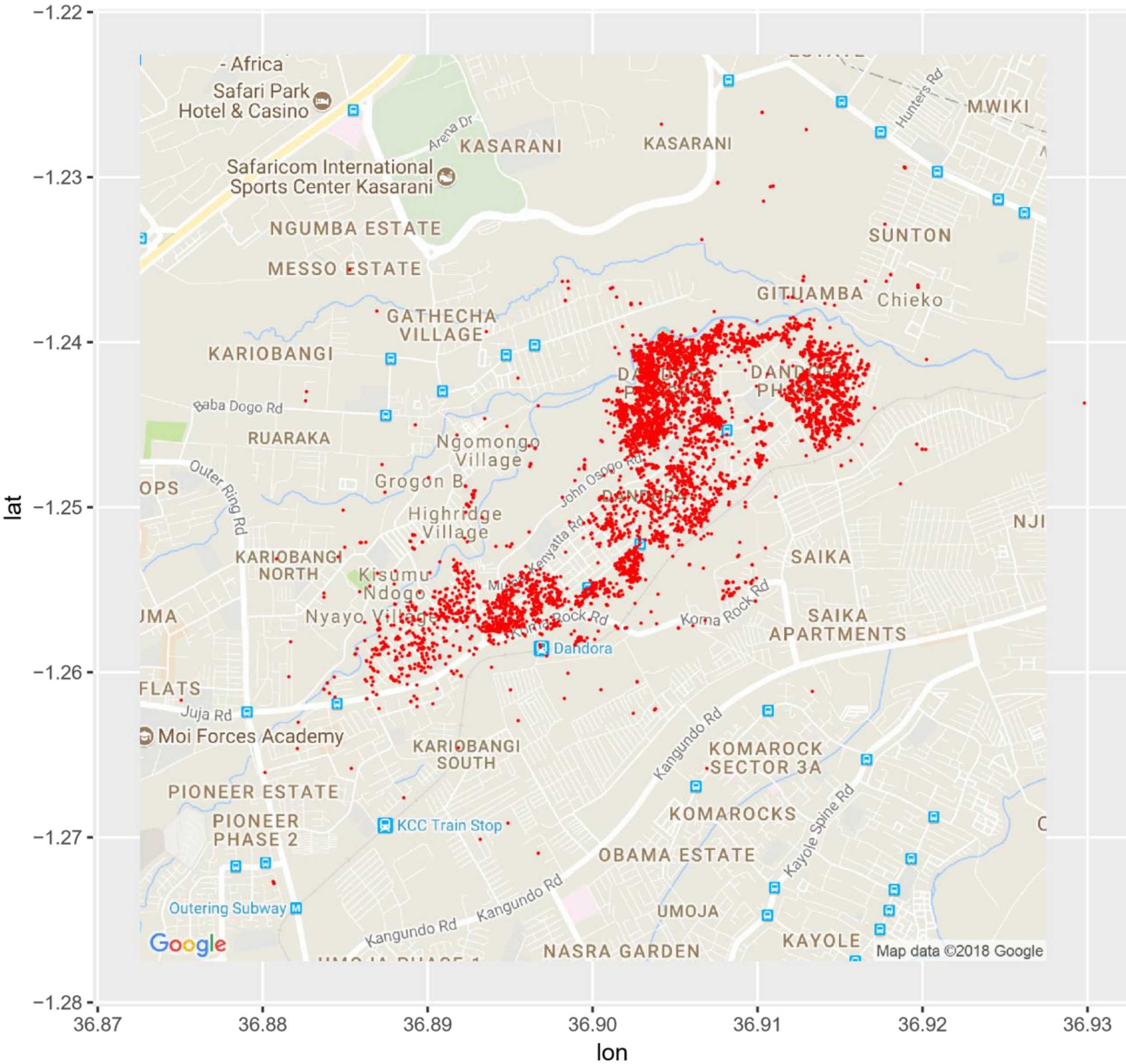
MOTHERHOOD AND FERTILITY MODULE	
insurance	33. Do you currently have health insurance? A. No B. Yes
insuranceType	34. What kind of insurance do you have? A. NHIF B. OBA C. Private Insurance D. Other
insuranceOther	35. The private insurance policy you have, what is the name of the company that provides it? Specify
insurancePrice	36. How much do you pay per month for insurance? (if the respondent doesn't pay monthly help them approximate the monthly rate)
generalHospital	37. Have you visited a clinic, hospital, or doctor in the last year to receive medical care unrelated to a pregnancy? A. No B. Yes
generalHospitalWhy	38. During the most expensive visit to a clinic, hospital, or doctor in the last year, what was the visit for? A. I was hurt in an accident and needed urgent care (example broken bones, stitches, allergic actions) B. I was very sick and needed to get medicine or another kind of treatment example malaria, pneumonia) C. I developed a condition and needed to sneak
generalHospitalPaid	39. How much did you spend in total on medical care received in the last year unrelated to pregnancy**?**
generalHospitalStill	40. Are you still seeking treatment for health conditions unrelated to pregnancy? A. No B. Yes
Anaemia	41. Do you suffer from anemia?
pregnantEver	42. Have you ever been pregnant?
pregnantAvoid	43. Have you ever used anything or tried in any way to delay or avoid getting pregnant?
timesPregnant	44. How many times have you been pregnant?
livebirths	45. How many livebirths have you had?
Deaths	46. Sometimes it happens that children die. It may be painful to talk about and I am sorry to ask you about such memories, but it is important to get correct information. Have you ever given birth to a son or daughter who was born alive but later died?
deathsBoys	47. How many of those were boys?

miscarriages	48. How many times have you had a pregnancy result in a miscarriage?
stillbirths	49. How many times have you had a pregnancy result in a stillbirth?
yearPreg	50. In what year did this pregnancy occur?
embakasinorthPreg	51. Were you living in Embakasi North sub County during this pregnancy?
nairobiPreg	52. Were you living in Nairobi during this pregnancy?
intended	53. Was this pregnancy planned?
marriedThen	54. Were you married to the father at the time?
monthsPreg	55. How many months were you pregnant before you gave birth?
antenatalcare	56. How many ante natal visits did you attend?
anc_first	57. How many months pregnant were you when you first went for an ante natal care visit?
ancSame	58. Did you get ante natal care at the same facility where you planned to give birth? A. No B. Yes
ancElseWhy	59. Why did you go somewhere different for ante natal care than the place you planned to give birth?
ancElseWhyMain	60. What was the main reason you when somewhere different for ante natal care than the place you planned to give birth? A. I was saving up to give birth in a nicer hospital than where I received ante natal care B. I could afford ante natal care at that hospital, but not a birth there C. Convenience: it was easier to go to the place where I received ante natal care than where I gave birth D. Complications: I needed to go to a special hospital like Kenyatta because of complications
insurancePr	61. Did you have health insurance during this pregnancy?
insuranceTypePr	62. What kind of insurance did you have?
insurancePricePr	63. How much did you pay per month for insurance?
talkPrice	64. Did anyone talk to you about how expensive it would be to give birth during ante-natal care?
contactHospital	65. Did you contact hospitals about prices before giving birth?
savingMonths	66. How many months before you gave birth did you begin putting aside money to pay for it?
Iron	67. During this pregnancy, did you take any iron tablets or iron syrup?
Folic acid	68. During this pregnancy, did you take any folic acid?
malarial	69. During this pregnancy, did you take any anti-malarial medication?

Tetanus	70. During this pregnancy, did you receive a shot in the arm to prevent the baby from getting tetanus (convulsions after birth)?
vitaminA	71. Did you experience any problems seeing during the daytime or at night?
specialist	72. Did you visit an OB/GNY or specialist before giving birth? A. No B. Yes
Referral	73. Were you referred to a larger hospital like Kenyatta National because a doctor determined that there might be complications with your pregnancy? A. No B. Yes
complicationExpected	74. What complication where you referred for? A. Sepsis B. Hemorrhage C. High blood pressure D. Other
whereBirth	75. Where did you give birth on this occasion? A. Hospital B. Home
plannedFacility	76. Is this where you originally planned to give birth, or did you have to change your plans? A. No B. Yes
whyChangePlans	77. Why did you change your plans? A. The baby came early and I had to go to the nearest facility B. I wasn't able to afford the facility I originally planned on C. I had more money that I expected when the baby was born so I could go to a nicer facility D. Other
outsideFacility	78. Why didn't you deliver in a health facility? A. It was too expensive B. I couldn't get to one in time once I went into labor C. I don't trust the Doctor and nurses at the facilities I can afford D. I don't trust health facilities E. Other
whyHere	79. What qualities of the Health Facility did you find important in making the choice of delivering there? A. Cost B. Cleanliness C. Distance from home D. Availability of supplies and equipment E. Qualification of health worker(nurse or doctor) F. Waiting time G. Staff attitude H. Referral by relative I. Other
whyHereMost	80. What was the most important quality of the Health Facility in making the choice of delivering there? A. Cost

	B. Cleanliness C. Distance from home D. Availability of supplies and equipment E. Qualification of health worker(nurse or doctor) F. Waiting time G. Staff attitude H. Referral by relative I. Other
birthTime	81. About how many hours did it take to deliver the baby, starting from when you first experienced contraction pains?
ceaserean	82. Was this a normal birth, or was the baby delivered by cesarean section? A. Normal birth B. Ceaserean
ceasereanEmergency	83. Was the cesarean planned or unexpected? A. Planned B. Unexpected
doctorAtAll	84. After you arrived at the hospital to give birth, did you see a doctor, or only nurses and birth attendants? A. No B. Yes
	Thank you for participating in our survey. We really appreciate your time, and are grateful for meeting with us today.

APPENDIX E: SAMPLING MAP OF EMBAKASI-NORTH SHOWING GEOGRAPHIC POSITIONING SYSTEMS



APPENDIX F: THE DCE EXPERIMENTAL DESIGN

Respondent	Choice task	Alternatives	Alternative Specific Constant	I.	II.	III.	IV.	V.	VI.
			A	B	C	D	E	F	G
1	1	1	1	0	0	0	1	1	3000
1	1	2	1	1	1	1	1	0	5000
1	1	3	0	0	0	0	0	0	0
1	2	1	1	1	1	0	1	1	3000
1	2	2	1	1	0	0	0	0	3000
1	2	3	0	0	0	0	0	0	0
1	3	1	1	1	0	0	0	1	3000
1	3	2	1	0	1	1	1	0	5000
1	3	3	0	0	0	0	0	0	0
1	4	1	1	0	1	1	0	0	5000
1	4	2	1	1	0	0	1	1	8000
1	4	3	0	0	0	0	0	0	0
1	5	1	1	1	1	1	1	1	8000
1	5	2	1	0	0	0	0	0	5000
1	5	3	0	0	0	0	0	0	0
1	6	1	1	0	0	1	0	0	3000
1	6	2	1	1	1	1	1	1	5000
1	6	3	0	0	0	0	0	0	0
1	7	1	1	1	0	1	1	0	8000
1	7	2	1	1	1	0	0	1	3000
1	7	3	0	0	0	0	0	0	0
1	8	1	1	1	1	1	1	1	8000
1	8	2	1	0	0	0	1	1	5000
1	8	3	0	0	0	0	0	0	0
1	9	1	1	0	1	1	1	0	8000
1	9	2	1	1	0	0	0	1	3000
1	9	3	0	0	0	0	0	0	0
1	10	1	1	1	1	0	0	0	5000
1	10	2	1	0	0	1	1	1	8000
1	10	3	0	0	0	0	0	0	0
1	11	1	1	0	1	0	1	0	3000
1	11	2	1	1	0	1	0	1	5000
1	11	3	0	0	0	0	0	0	0

1	12	1	1	0	0	1	1	1	3000
1	12	2	1	1	1	0	0	0	5000
1	12	3	0	0	0	0	0	0	0
1	13	1	1	0	1	0	1	1	8000
1	13	2	1	1	0	1	0	0	5000
1	13	3	0	0	0	0	0	0	0
1	14	1	1	0	1	0	1	0	3000
1	14	2	1	1	0	1	0	1	3000
1	14	3	0	0	0	0	0	0	0
1	15	1	1	1	1	1	1	1	3000
1	15	2	1	0	0	0	0	1	3000
1	15	3	0	0	0	0	0	0	0
1	16	1	1	1	1	0	1	1	3000
1	16	2	1	0	0	1	0	1	3000
1	16	3	0	0	0	0	0	0	0

APPENDIX G: THE DCE SURVEY QUESTIONNAIRE

A DISCRETE CHOICE EXPERIMENT(DCE) ON PREFERENCE FOR PLACE OF DELIVERY IN EMBAKASI-NORTH AND NAIVASHA SUB COUNTY

Improving maternal health has been a key commitment of the Kenyan Government through the Ministry of Health and County Governments. In 2013 a Free Maternity Services policy was initiated by a presidential decree to provide free delivery care and subsequently reduce barriers associated with receiving maternal health services.

Strathmore University Institute for healthcare Management is conducting research to evaluate utilization of healthcare facilities to attempt to determine women's preferences for place of delivery using a Discrete choice experiment methodology

This experiment is been conducted from women's perspective and your household has been randomly selected to participate in this survey. We want to know your preferences for place of delivery. There are no right or wrong answers. While your response is extremely important to us, your participation is voluntary. This questionnaire will take between 10 to 15 minutes to complete. Your responses will be confidential and will not be linked to you or shared with anyone.

For any question about the research kindly contact:
Jackline Aridi, Phone 0715961081; Email: Jackline.Aridi@strathmore.edu
OR Prof. Gilbert Kokwaro, Director, Institute for Healthcare Management, Strathmore Business School, Strathmore University, Phone: 0722323651 Email :gkokwaro@strathmore.edu or Dr. Francis Wafula, Tel. No: 0722679467: E-mail: fwafula@Strathmore.edu. Dr Mary. B Adams. Tel No0739579629 marybadams@gmail.com

Would like to receive the	Yes	□	No	□	

results of the study?				

If you prefer the report via email, please provide an email address here:_________________________

II.THE DISCRETE CHOICE EXPERIMENT ON PLACE OF DELIVERY

Our objective is to conduct a DCE experiment to explore the relative importance of health service characteristics to Kenyan women living in Naivasha sub-County, Nakuru County. This will be compared to a similar cohort of women in Embakasi North in Nairobi County to try and elucidate what women's preferences are when they are selecting a place of delivery.
You will be provided with a script (on a mobile phone/tablet) and you will be asked to imagine that you are pregnant and you are given a choice between the following two health facilities to deliver your baby in. Which one would you prefer? Facility A or Facility B? you also have an option of choosing none of the two health facilities as Option C. This implies delivering your baby at home. There is no right or wrong answers

SAMPLE CHOICE CARD

Attribute	Health Facility A	Health Facility B	Option C
Quality of services	Good quality services	Poor quality services	(None of the two health facilities/ Birth at home)
Attitude of healthcare workers	Kind attitude	Unkind attitude	
Cost of delivery services	3000Ksh	5000Ksh	
Availability of equipment and supplies	Equipment& supplies not available	Equipment & supplies available	
Distance to health facility	Facility is close to home	Facility is far from home	
Availability of referral services at health facility	Referral services not available	Referral services available	
Your choice (tick only one)	□	□	□
How certain are you about this choice? **Not Certain □ Slightly certain □ Moderately certain □ Certain □ Very certain □**			

You will see that each choice has different combination of attributes. In this example you can see Option A has good quality services, kind attitude , costing 3000Ksh and is close to home, it however lacks supplies & equipment and referral services. Option B has poor quality services, with unkind workers, is far from home and costs 5000ksh. However, it has equipment and supplies and referral services. Option C means no health facility / home delivery. You are required to make trade-offs with the attributes presented.

THANK YOU FOR YOUR HELP!

APPENDIX H: APPROVAL FOR DATA COLLECTION IN NAIVASHA SUB COUNTY

REPUBLIC OF KENYA
NAKURU COUNTY GOVERNMENT
DEPARTMENT OF HEALTH SERVICES

Telegrams "PROVMED"Nakuru
Tele: Nakuru 2216710 Fax 22
EMAIL:
When replying please quote

COUNTY DIRECTOR ADMINISTRATION & PLANNING
NAKURU COUNTY
P.O. BOX 2060
NAKURU

NCG/PSM/4/14/VOL I/156

2nd June 2016.

RE: **PERMISSION TO CARRY OUT RESEARCH ON UNDERSTAND DELIVERY OF DECISIONS OF NAIVASHA SUB COUNTY MOTHERS**

This office is in receipt of your request to undertake the above named research.

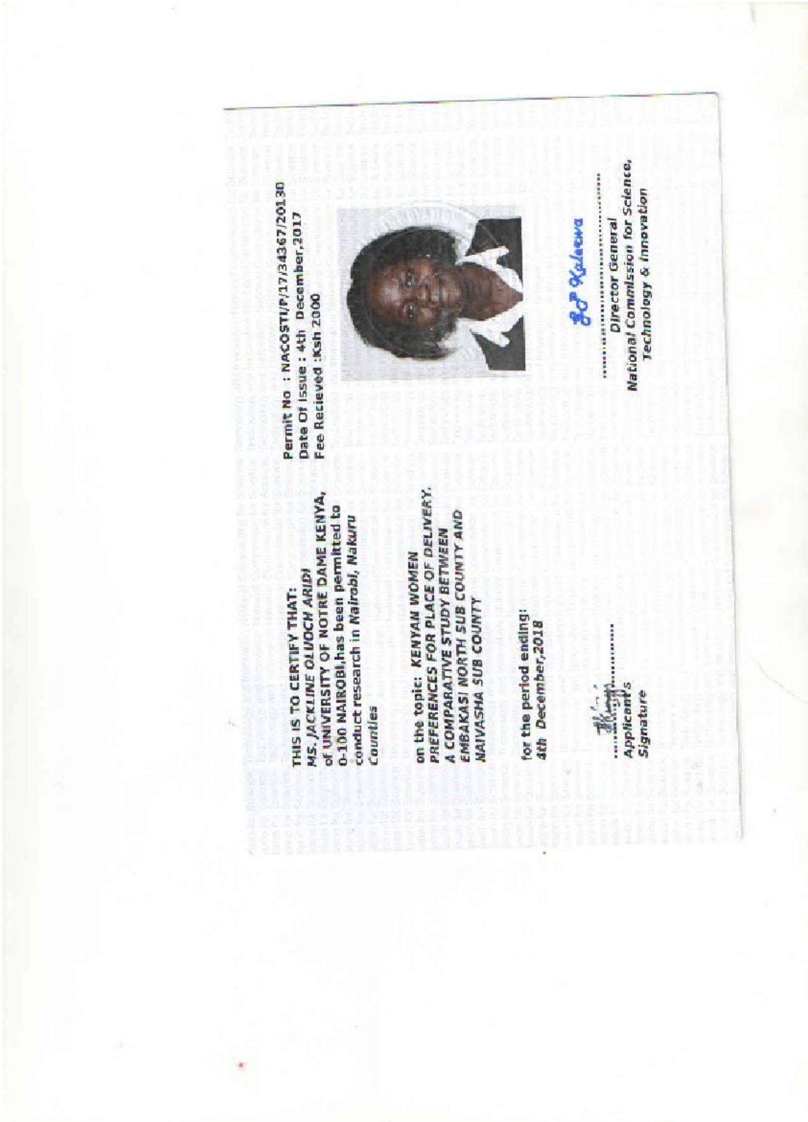
We have received your proposal and find it in order

Your are granted the same and report to the Sub County Medical Officer of Health for the same

DR. BENEDICT OSORE
COUNTY DIRECTOR OF ADMINISTRATION & PLANNING
NAKURU COUNTY.

cc. CDHS
SC MOH NAIVASHA

APPENDIX I: NACOSTI PERMIT TO CONDUCT THE RESEARCH STUDY



THIS IS TO CERTIFY THAT:
MS. JACKLINE OLUOCH ARIDI
of UNIVERSITY OF NOTRE DAME KENYA, 0-100 NAIROBI, has been permitted to conduct research in Nairobi, Nakuru Counties

on the topic: KENYAN WOMEN PREFERENCES FOR PLACE OF DELIVERY. A COMPARATIVE STUDY BETWEEN EMBAKASI NORTH SUB COUNTY AND NAIVASHA SUB COUNTY

for the period ending:
4th December,2018

Applicant's Signature

Permit No : NACOSTI/P/17/34367/20130
Date Of Issue : 4th December,2017
Fee Recieved :Ksh 2000

Director General
National Commission for Science, Technology & Innovation

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 020 400 7000, 0713 788787 0735404245
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/17/34367/20130**

Date: **4th December, 2017**

Jackline Oluoch Aridi
University Of Notre Dame
USA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "***Kenyan women preferences for place of delivery, a comparative study between Embakasi North Sub County And Naivasha Sub County***" I am pleased to inform you that you have been authorized to undertake research in **selected Counties** for the period ending **4th December, 2018.**

You are advised to report to **the County Commissioners, the County Directors of Education and the County Directors of Health Services, selected Counties** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

G.P. Kalerwa

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioners
Selected Counties.

The County Directors of Education
Selected Counties.

APPENDIX J: AMREF ESRC ETHICAL REVIEW BOARD APPROVAL FOR RESEARCH

amref
health africa

Amref Health Africa in Kenya

REF: AMREF – ESRC P388/2017

October 30, 2017

Jackline Olouch,
Strathmore University,
Tel. No. 0715961081
Email: Jackline.A.Oluoch-Aridi.1@nd.edu

Dear Jackline Olouch,

RESEARCH PROTOCOL: KENYAN WOMEN'S PREFERENCES FOR PLACE OF DELIVERY: A COMPARATIVE STUDY BETWEEN EMBAKASI NORTH SUB-COUNTY AND NAIVASHA SUB-COUNTY, KENYA

Thank you for submitting your protocol to the Amref Ethics and Scientific Review Committee (ESRC).

This is to inform you that the ESRC has approved your protocol. The approval period is from October 30, 2017 to October 29, 2018 and is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc.) will be used.
b) All changes (amendments, deviations, violations etc.) are submitted for review and approval by Amref ESRC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the ESRC immediately.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to Amref ESRC immediately.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period (attach a comprehensive progress report to support the renewal).
f) Clearance for export of biological specimen or any form of data must be obtained from Amref ESRC, NACOSTI and Ministry of Health for each batch of shipment/export.
g) Submission of an executive summary report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

Please do not hesitate to contact the ESRC Secretariat (esrc.kenya@amref.org) for any clarification or query.

Yours sincerely,

AMREF - ESRC
P.O. Box 30125 - 00100 NAIROBI

Prof. Mohamed Karama
Chair, Amref ESRC

CC: Dr. George Kimathi, Director Institute of Capacity Development, Amref Health Africa and Vice Chair Amref ESRC
Samuel Muhula, Monitoring & Evaluation and Research Manager, Amref Kenya

P O Box 30125- 00100 Nairobi Tel: 254 - 020 699 4000 Fax: +254 020 6006340 / 6002531, www.amref.org

Winner of the Gates Award for Global Health

APPENDIX K: PUBLICATIONS

1. **Oluoch-Aridi J**, Wafula F, Adam B. M, & Kokwaro G, 'We just look at the well-being of the baby and not the money required': A qualitative study exploring experiences of quality of maternity care among women in Nairobi's informal settlements in Kenya. https://bmjopen.bmj.com/content/10/9/e036966.info

2. **Oluoch-Aridi J**, Wafula F, Adam B.M & Kokwaro G, et al. Understanding what women want: eliciting preference for delivery health facility in a rural sub-County in Kenya, A Discrete Choice Experiment. Submitted to BMJ Open 2020 036965

3. **Oluoch-Aridi J,** Wafula F, Adam B. M., & Kokwaro G, Eliciting women's preferences for place of delivery in a peri-urban setting in Kenya. A Discrete Choice Experiment. Submitted to PLOS ONE. PONE-D-19-31801

APPENDIX L: TURNITIN REPORT

PhD Thesis March

ORIGINALITY REPORT

18%	13%	9%	12%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.globalfinancingfacility.org Internet Source	1%
2	Mandy Ryan. "Discrete Choice Experiments in a Nutshell", The Economics of Non-Market Goods and Resources, 2007 Publication	1%
3	Submitted to International Health Sciences University Student Paper	<1%
4	eprints.bournemouth.ac.uk	<1%