

**FACTORS ASSOCIATED WITH CONTINUUM OF MATERNAL
HEALTH CARE IN KENYA**

**BY
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DECLARATION

This project is my original work and has not been presented for a degree in any other University

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DEDICATION

I dedicate this research work to my beloved father John Otindu, my mother Valerian Gicuku, and my siblings Joyce Mmbone, Doris Jatia and Sarah Njeri. God bless you all for your continued support and prayers.

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I am indebted to the almighty God who has given me the grace to go through the course work and undertake the research to this far.

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ABBREVIATIONS

ANC	Antenatal Care
HIV	Human Immunodeficiency Virus
KDHS	Kenya Demographic Health Survey
MDG'S	Millenium Development Goals
MNCH	Maternal Neonatal Child Health
PNC	Postnatal Care
RMNCAH	Reproductive Maternal Newborn Child Adolescent Health
SDG'S	Sustainable Development Goals
UHC	Universal Health Coverage
WHO	World Health Organization

ABSTRACT

This study focuses on uptake of maternal health care among pregnant women that is adequate antenatal care services use, health facility delivery and timely postnatal care of the mother. The aim of the study was to determine factors associated with the continuum of maternal health care in Kenya. It examined the predisposing, enabling and need factors related with the use of maternal health care services.

The study used data from Kenya Demographic and Health Survey 2014 and focused on women in the reproductive age 15-49 years with a live birth in the five years preceding the survey. To determine factors associated with the use of adequate antenatal care (attending one ANC visit within the first three months of pregnancy and at least four ANC visits throughout the pregnancy), delivery in the health facility and timely postpartum care (not more than 48 hours after delivery) logistic regression model was used.

Education, household wealth, health insurance and parity were found to determine uptake of maternal health care in Kenya. Women with higher education, women in the rich wealth quintile, women covered by health insurance and women with low parity had significantly higher odds for adequate ANC. Women with above secondary education, married women, women who live in the urban areas, rich wealth quintile women, employed women, women with only one child and women who received adequate ANC were more common in health facility delivery. Receiving timely postnatal care services is significantly associated with women in the rich wealth quintile, women's level of education, women with low parity, women who received ANC and women who delivered in a health facility.

From the study, we can see a link in the three outcomes, from the multivariate analysis, through a set of common factors. Women's education is the common predisposing factor, enabling factor is wealth and residence and parity is the need factor.

Education intervention approaches and health promotion should be provided in regions with low literacy levels. It is also important for government to increase household wealth in order reduce poverty and also to achieve maternal health coverage. And finally, maternal mothers should be encouraged to effectively attend postnatal health care services.

Ethnographic and qualitative studies should be undertaken to help understand how cultural factors affects maternal health utilization.

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CHAPTER ONE: INTRODUCTION

1.1 Background Information

Maternal health entails health of women in pregnancy, childbirth as well as postpartum period. It includes aspects of contraception, before conception, antenatal as well as post-delivery care in ensuring a fulfilling, positive experience during pregnancy while reducing maternal illness and death (WHO & UNICEF, 2010).

WHO ascribes maternal mortality as death of a woman due to pregnancy-related reasons irrespective of the place and period of pregnancy (in the course of pregnancy or in 42 days of the end of pregnancy) (WHO, 2010). To prevent and reduce most maternal deaths, basic services for maternal health care should be accessible. However, advancements in decreasing maternal death has been relaxed despite worldwide emphasis of need to address unmet health requirements of pregnant women and children (Oakley et al., 2009).

Maternal mortality ratio declined from 342 deaths in the year 2000 to 211 deaths in the year 2017 globally (Nikiema et al., 2009). To accomplish SDG goal of 70 maternal deaths per 100,000 live births, a 6.4% annual rate of reduction is required. Globally, we are at 2.9% average annual rate of reduction which is half of what is required for SDGs. Sub-Saharan Africa has a peak MMR at 546 deaths per 100,000 live births though it realized a significant decrease of 39 per cent of maternal death between 2000-2107 (Nikiema et al., 2009).

Sub-Saharan Africa hosts 66 percent of maternal deaths globally (Kerber et al., 2007). This demonstrates that maternal mortality is higher in comparison to different areas globally. Some reasons for higher maternal deaths in SSA include: inaccessibility to ANC services, poorer nutrition among women, higher fertility rates, higher prevalence of HIV infection and greater incidence of susceptible problems like poverty. For poor and middle-incomes states, maternal deaths among girls aged 15-19 years are caused by complications in pregnancy and childbirth. The significance of receiving adequate ANC services especially in pregnant adolescents is to detect and manage any complications and prevent deaths during pregnancy and this can be attained by receiving quality services by a skilled health worker (Kerber et al., 2007).

Compared to high-income countries, developing countries have fourteen times higher maternal mortality rates. These states comprise 99% of universal maternal deaths (242 per 100,000 live births). For Africa, maternal mortality ratio is highest within East Africa community that is Burundi, Tanzania and Kenya at 740, 410, and 400 deaths per 100,000 respectively (Freedman et al., 2007). Many pregnancy-related losses in Kenya are linked to delivery minus expert birth attendance as only 61.2% of the deliveries are conducted in a health facility (KNBS, 2014).

Through presidential decree in 2013, Kenya, like other African nations, abolished delivery charges for public health amenities (MOH, 2013). Eradicating these charges is a laudable intervention. Apart from cost, maternal health utilization is hindered by other issues like inadequate equipment in health facilities, distance between the health facility and where woman stays, lack of transportation to the health centers, poor healthcare quality and cultural and traditional activities (Wubs et al., 2016). According to McCarthy and Maine (1992), delays in deciding to seek skilled delivery services, delayed arrival to the health facility as well as in receiving adequate treatment and referral remains concerns in maternal mortality.

Therefore, financial obstacles to maternal health care use were partially addressed by free maternal care program in public health facilities. Factors like political, religious, environmental, religious, service quality in health facilities, other obstacles as well as health gaps have not been addressed yet they are part of the aspects associated with utilization of maternal health (Cheptum et al., 2014). This calls for a better intervention to lower the proportion of deaths related to pregnancy in the country.

Excellent maternal health services usage is key to achieving decreased maternal deaths as well as widespread access to these services. Improving access to skilful attendance in delivery and post-delivery services are crucial measures which have proven effective in decreasing maternal mortality (Cayemittes et al., 2012). Health systems needed should offer available, accessible and satisfactory care. It entails contraception, safer pregnancy terminations, expert delivery and post-delivery care. Accountable and responsive emergency obstetric services should be connected to all of the reproductive health services for consultation, referral and transportation.

1.2 Problem Statement

The number of females who yearly from difficulties of pregnancy and childbirth decreased from 532,000 to 303,000 between 1990-2015. Over 800 women perish every day due to pregnancy related difficulties and for each death, approximately twenty others suffer from infections, disabilities and injuries associated with pregnancy. Poor nations accounts for almost all maternal deaths (99%) leading with Sub Saharan Africa and South Asia which comprise 88% of maternal demises globally. African countries have the greatest mortality ratios accounting for 66% of all maternal deaths yearly all over. South Asia follows with 22 per cent of global total maternal demises with death ratios of 182 per 100,000 live births (Alkema et al., 2016).

In Kenya, maternal mortality ratio reduced from 488 to 362 deaths per 100,000 live births for years 2009- 2014. This is above universal average of 210 deaths in 2013. Neonatal mortality rates are still high at 22 deaths per 1000 live births despite major reforms by national and county governments in the health sector (Gitobu et al., 2018). However, disparities in maternal mortality persist within counties ranging from 189/100,000 in Elgeyo-Marakwet to over 1000/100,000 in Mandera, Wajir, Marsabit and Turkana counties (KDHS, 2014). The problem of maternal and neonatal mortality can be addressed by refining coverage and quality of prenatal, delivery and postpartum care.

According to WHO (2010), expectant women must receive the first prenatal care visit in first trimester and attend more than four ANC appointments throughout pregnancy. According to the KDHS 2014, almost all expectant women (96%) had ANC visits but only 58% made the endorsed number of ANC visits. It's very low compared to the UHC target of 100%. Achieving the 100% ANC coverage comprising at least four visits will reduce maternal mortality and morbidity as many women will deliver in a health facility through skilful attendants and get checked within 48 hours after delivery to ensure there are no complications.

Deaths that occur around labor and during delivery can be prevented by women delivering in health facility by experts since it guarantees proper as well as timely care while giving birth (Bua et al. 2015).

KDHS 2014 showed that more than half of the women (61%) who delivered five years preceding the survey delivered in a health facility and 53% of them got timely PNC (KNBS et al. 2015). The study purposes to determine issues which impact uptake of maternal health care in Kenya.

1.3 Research Question

- What factors influence the utilization of antenatal care services in Kenya?
- What factors influence the utilization of health facility delivery care services in Kenya?
- What factors influence the utilization of postnatal care services in Kenya?

1.4 Research Objectives

Main objective in the study is to determine issues associated with use of maternal health care services in Kenya

1.4.1 Specific Objective

- To determine factors associated with antenatal care utilization
- To determine factors associated with health facility delivery utilization
- To determine factors associated with postnatal care utilization

1.5 Justification of the Study

Kenya has high maternal death rates; this study aims at understanding the issues pertaining usage of maternal health care services by expectant women. Women are informed on how to care for themselves and the babies, and also detection of complications during pregnancy when they seek the antenatal care services on time. Maternal and neonatal deaths are reduced by delivering in a health facility by a skilled birth attendance.

In formulating appropriate policies for maternal mortality reduction, patterns of maternal health care use may be analyzed and therefore this paper is also beneficial to policy makers. The focus of Government policy has been to eliminate fees while accessing delivery services in public hospitals. This will ensure a big percentage of pregnant females are not disadvantaged due to the

delivery fees. Other important considerations should be accountable to achieve 100 percent delivery in a health facility

Vision 2030 and numerous approaches have been enacted in achievement of SDG 3.1. To be able to attain national maternal mortality goals as articulated in these documents, the population needs to comprehend the importance of usage of maternal health care services.

1.6 Limitations of Study

Cultural practices and belief information is not available in the KDHS data. It provides data on characteristics of available data.

Other services such as contraception are excluded since a key focus on the study is on services in pregnancy, delivery and after delivery.

Findings explanations are not available since the data is of quantitative nature. For example, a number of the essential aspects like remoteness of health facility, quality of care and transportation.

Demographic outcome on child and maternal mortality contained in the conceptual framework applied was not analyzed due to missing maternal health care information pertaining to dead children in the dataset.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

The chapter summaries literature available that concerns timing and number of prenatal care, health facility delivery by a trained birth attendant and the timely postpartum care services amongst women in the world and later narrows it to Kenya.

2.1 Maternal Health

A major problem pertaining health in developing countries is maternal health. This is the health of children and women in pregnancy, delivery and after delivery period including antenatal and postnatal care, contraception and care given before conception so as to reduce deaths among women in the reproductive age. Health services usage depends on availability, quality and financial costs as well as personal characteristics, social structure and individual health cultures (WHO & UNICEF, 2010). Income differentials exists in developing countries and to be able to access better health, one should have higher income and better social status hence slow progress in achieving the low maternal mortality rates.

A study by Khan (1987) showed the relationship between maternal health and child health during early infancy. From the study, there is a positive health impact on the newborn when women receive these services. Major causes of maternal and neonatal death can be addressed through prenatal care and trained birth attendance.

The WHO advocates for women without complications to have at least four ANC visits and this is one visit after every three months of gestation and a final visit before giving birth. Recently, the WHO guidelines have changed to eight ANC visits and this is a challenge because most women do not make the four visits during pregnancy.

Worldwide, underutilization of maternal health services is a main reason of maternal illness and deaths. For poor nations majority of women do not receive prenatal care and if they do, they go for the services in the late months of their pregnancy and prefer homebirths (Mekonnen and Mekonnen, 2003). Hence pregnant women miss out on vital information on healthcare and

nutrition of the child, it is impossible to identify high-risk pregnancies, transmitting information on the importance of family planning are missed and obstetric histories are ignored. In developing countries, use of maternal healthcare and infant survival indicate rural-urban dichotomy from most studies (Kausar, Griffiths and Matthews, 1999).

An association exists between health-delivery system organization and health care utilization which is influenced by the if the care provided is of quality, financial costs, continuity, resources and services availability, health beliefs by the community, comprehensiveness of services and social structures (Fiedler, 1981).

Kenya has a significant maternal death at 362 per 100,000 live births and most of these deaths can be stopped by proper maternal health care use (KDHS, 2014). In 2014 according to the KDHS, only 61% of women gave birth in a health facility and 62% were assisted by skilled healthcare providers. This is not indicative of fit and well-functioning systems.

In the year 2003, the government of Ethiopia established a Health Extension Programme in primary health care facilities. This was due to high death ratio in Ethiopia at 673 deaths per 100,000 live births. This programme had 33,000 health extension workers were taught various responsibilities being expected to provide services to the women while pregnant, during delivery and also check them after delivery for any minor or major complications and those with complications to be referred to better health facilities with the available resources. The trained health workers also supervised lay midwives and volunteers in the health sector that supported health education in the communities. Ethiopia's maternal health consumption study found a relationship between delivery by skilled health workers and decrease in maternal mortality (Tsegay et al., 2013).

In promoting safe maternity and child survival, Kenya launched National Reproductive Health Services Delivery Strategy, 1997-2010, which had the following important components; contraception, prenatal care, safe delivery, as well as important obstetric, prenatal, neonatal and post-abortion care. Integrated Management of Childhood Illnesses (IMCI) strategy was developed by 1998 and set in motion in the year 2000. Since the 2010 WHO Report and 58th

WHO Assembly resolve Universal Health Coverage has been the target (Evans and Etienne, 2010) and it has been part of SDG 3.8 stating “Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all” (Un.org, 2019).

UHC has become a priority after we failed to achieve the MDGs. To be able to attain the UHC goals, monitoring and evaluation should be done at both the global and country level, though Kenya does not yet have an official order about the goals, objectives and observing, and assessing performance.

UHC ensures each citizen accesses quality healthcare services needed without facing financial difficulties or, getting further into poverty. In achieving UHC, the health system delivery challenges and health financing reforms need to be addressed. According to WHO (2010) there are three key areas that are essential for health reforms; raising health funds to offer health services, refining proficient and equitable use of the existing health resources and shifting to viable pre-payment methods (Obare, Brolan& Hill, 2014).

There is a decline in maternal, newborn and child mortality but it has been slow and this led to the initiation of Beyond Zero campaign by the First Lady hence the declaration of free maternal health policy in 2013 (Beyond Zero Campaign, 2014).

In Kenya, UHC involves scaling up immunization, improving maternal and child health deterrence of water-borne illnesses, vector-borne diseases, HIV and STIs, Tuberculosis as well as prevention of non-communicable diseases among women in the reproductive ages (Vision 2030).

A crucial component of UHC that affects women is the accessibility to maternal healthcare. There are 16 essential health services across four categories that are used to measure the intensity and equity of UHC in countries. The indicators in reproductive, maternal, child health include contraception, antenatal as well as delivery care, health-seeking behavior for pneumonia and full child immunization (Vision 2030).

Improvement in maternal health services in developing countries is done through understanding the community practices about maternity care, elimination health utilization inequalities care and health services development is needed (Esamai et al., 2017).

Countries that are successful in improving maternal health have population inequalities as a major challenge. There is a high tendency of illness and deaths in disadvantaged women, and low provision in maternal health services which are unaffordable to increase safe pregnancy and delivery (Who.int, 2019).

2.2 Continuum of Maternal Health

i. Antenatal Care

The good health of the women can be promoted during pregnancy and this prepares them emotionally and psychologically for parenthood. Prenatal care is the care provided to expectant females for better health outcomes for the mother and the baby by skilled healthcare providers. Key aspects of ANC entail sporadic preventive treatment for malaria in pregnancy (IPTp), identification and management of obstetric complications and other diseases like HIV, syphilis and other STIs. Survival of mother and babies is improved through good quality service of antenatal care. ANC also increases chances of health facility delivery by able attendant (UNICEF DATA, 2019).

Health professionals recommend that a pregnant woman should have her first prenatal visit in first trimester and carry on every month through 28th week then fortnightly until 36th-week or till delivery. Getting better maternal health services helps in discovery and management of pregnancy-related problems and reduces maternal and new born mortality rates. Discovery and management of diseases does not mean the prevention of all causes of maternal and infant demises (Mbuagbaw and Gofin, 2010).

The several factors which influence utilization of antenatal care are; reproductive characteristics, socioeconomic, husband's attitude towards maternal health, family income, remoteness of the health facility, females' autonomy, accessibility as well as availability of the healthcare services.

To be able to achieve a high quality of ANC all pregnancies should be treated as high-risk pregnancies and monitored for complications (Tekelab, Chojenta, Smith & Loxton, 2019).

Women in Ethiopia who attended four plus prenatal care visits had higher probability of delivering in a health facility and receive timely PNC (Fekadu et al., 2019). Mothers are knowledgeable on significance of this delivery when they attend required ANC visits.

In Africa, a high proportion of women attended at least one ANC visit. Those who get ANC services in their last trimester were advised on the importance of early check-up for the mother and the baby and also health facility delivery. Women who receive good ANC services have high chances of getting skilled attendants in childbirth, and if they have that, they are more likely to receive timely PNC (Warren et al., 2017).

ii. Delivery Care

As much as 90% of Kenyan women access antenatal care from professionals, slightly more than half of all births (52%) happen in health facility, as per 2014 Kenya Demographic Health Survey. Occurrence of home births contributes to higher death rates which have been increasing consistently (van den Broek and Graham, 2009).

Study done in South Ethiopia by Asefa et al., (2019) found a mismatch in antenatal care attendance and delivery. Almost 75% of women had home deliveries yet they had attended antenatal visits. This highlights that in Southern Ethiopia even if the women received ANC services they preferred home delivery.

Timely PNC is associated with location of delivery. A study in Zambia revealed that women who delivered in health facilities by expert attendants were two times as much to receive timely PNC in comparison to those who did not. This is because in the health facility the health personnel would ensure a woman is checked for any complications before being allowed to go home (Chungu et al., 2018).

iii. Postnatal Care

This is the care availed to mother and baby instantly after delivery and the first six weeks. It includes monitoring, counseling and providing healthcare services to the mother and infant. The emotional and physical wants of the mother are provided by a skilled health worker together with obstetrician, pediatricians and community health workers. The most dangerous period in the lives of the mothers and newborn is during postpartum because many maternal and infant deaths happen in this period and yet it is the least prioritized in the quality of care (World Health Organization, 2019).

Majority of population aren't concerned about postnatal care because they assume that when pregnancy and childbirth are smooth and do not have complications then physical recovery is guaranteed but unfortunately during this time maternal and neonatal morbidity and mortality occur due to preventable complications (Roets et al, 2018). Globally, 830 women die daily due to postpartum infection and postpartum hemorrhage and if postpartum care is provided then it can be prevented. In 2004 Kenya established guidelines to advance and reinforce postnatal care by increasing the assessment and timing within six weeks after delivery but despite all this, only 19% of the mothers received postpartum care services (Roets, Chelagat and Joubert, 2018).

Women more likely to access PNC services had histories of ANC appointments. The probable explanations for this positive impact was that ANC offered women access to healthcare system including providing therapy and mindfulness about importance of PNC. Furthermore, if this experience was positive, women become prepared to have PNC visits (Sisay et al., 2019)

Compared to home births, timely PNC is higher in facility births. Study findings by Singh et al., (2012) based on concentration indices suggest that compared to health facility births, in selected postnatal care components, there exists high economic disparities in case of home delivery hence PNC services limited for women with home births.

2.3 Factors Pertaining Access to Maternal Healthcare

i. Access to finance

Financial affordability is essential in maternal health use. It is similarly linked to dimensions of poverty. Study by Collins et al., (1996) shows that introducing user fees in Kenya led to reduced utilization of health care and this effect was more significant to the poor. In Uganda, a study was

carried out in abolition of user fees and the results showed rising use of health services (Burnham, 2004). Financial accessibility includes cost of transportation, direct costs of treatment and opportunity cost of time for mother and her companion. Financial accessibility can be both a barrier and a facilitator, and a distinction between choosing access to public over private maternal-child health services (Shihaji et al., 2011).

Because of insufficient progress towards refining maternal health, while aiming to decrease maternal deaths many countries have come up with various interventions of reproductive health. One such key intervention in Kenya is the introduction of Free Maternity Care Program to enable mothers have free health facility delivery. The Free Maternity Care Program increases access and improves use of these services with the aim to reducing maternal deaths (Beatrice and Mukaka, 2017).

ii. Geographical factors

There is an inverse relationship between time to travel and use of health care services (Peters et al., 2008). Geographical accessibility includes components such as user's location, health care location (distance between the two), quality of communication systems and roads. It is inextricably linked to financial accessibility. For example, a low-income household woman who is closer geographically to a private facility may be forced to travel further for more affordable services (Shihaji et al., 2011).

Study by Essendi et al., (2015) on challenges on infrastructure to better maternal health facilities in Kenya in relation to the community and skilled health workers found that the main problem in accessing maternal healthcare services was poor infrastructure. Majority of the healthcare facilities were far from the community hence risky for mothers.

iii. Availability and access to health providers

This is assessable in terms of opportunity to access health care when desired. Long waiting periods, absentee workers, inadequate drug supply in public facilities and limited hours are some of the problems documented in developing countries leading to prevalent use of informally trained healthcare workers (Peters et al., 2008).

A significant factor in maternal health is access to health providers since they are a requirement for delivery of better health outcomes. Despite growing numbers of health workers in Kenya, we have not achieved the 3 health workers per 10,000 populations according to the National Human Resource (Mugo et al., 2018).

iv. Education Level

Education status is attributed towards the level of knowledge attained which enables them to make informed decisions. They are also likely to have information and knowledge to recognize specific illness and modern medical treatment. Females having low education in comparison to those having high education level have low use of maternal health services (Cheptum et al., 2014).

Though education is a strong independent aspect in the usage of maternal health care services, Gage and Calixte (2006) claim this strong association is diluted when factors like habitation and socio-economic setting are put in place. In Nigeria, education level did not have a significant association with access to maternal health. This were outcomes of a study to establish the socio-cultural factors that determine maternal health (Ugal et al., 2008).

v. Marital Status

A cross-sectional survey assessment by Amrita et al. (2012) on role of gender inequalities on women access to maternal healthcare services in Namibia, Kenya, Nepal and India found that those in early marriages do not fully use maternal health amenities as they lack knowledge on their significance and also decisions concerning their health are made by someone else (Grown et al. 2005).

Study on factors affecting the utilization of antenatal care in developing countries (Simkhada et al., 2008) found that married women were more likely to attend antenatal clinics than the unmarried. This is because of support from their partners and also social acceptability of the pregnancy compared to the adolescents and unmarried younger women hid their pregnancy to avoid social embarrassment. However, single and divorced mothers in Ethiopia were more likely to attend antenatal care compared to married mothers (Gitonga, 2017)

vi. Maternal Age

Age is a key determinant in maternal health utilization. For example, in Bangladesh, younger women had lower rates of maternal health use as compared to the older women (Chakraborty et al 2003). In Tanzania, there is an inverse relationship between the age of the woman and delivery by skilled health attendance (Mpembeni et al (2007). These findings were similar to studies in Kenya, Jordan as well as China among other countries (Ikamari, 2005; Short & Zhang, 2004; Obermeyer and Potter, 1991).

vii. Income/ Employment status

Cost of maternal health services is another dimension to its accessibility. Employed women have health facility delivery and this is because poor women cannot afford to pay for the services even if there are many health facilities near them (Buor, 2004). A study in Tanzania concluded that existence of high maternal deaths among the unemployed women than those who are employed (Gwamaka, 2012). Employed women are able to save and so will have money to spend at the health facility. Sharma et al (2007) findings indicated that employment may not be related to better use of maternal healthcare since non-working women are better compared to working ones.

viii. Residence

Urban residents have a high odds of access to maternity care through trained professionals (Letamo et al, 2003). Poor road infrastructure and inadequate transportation to health amenities explain why there is low use of maternal health care for remote areas of Western Kenya (Letamo et al, 2003). Women living close to health facilities and t urban residents have greater probabilities of health facility delivery in comparison to those who don't. (Letamo et al, 2003).

ix. Parity

This entails number of times a female has delivered a fetus above conception period of 24 weeks. Females seek maternal healthcare for first births paralleled to mothers with more than four children (Kaupova et al., 1998). Women with high parity start their first ANC visit after three months and have lesser probability of delivering using skilled health professional, because they feel knowledgeable and experienced from previous experiences (Ochako et al., 2011).

x. Decision making at home

Culture has restricted decision-making abilities of women in developing countries. This is a consequence of diverse gender roles and family social hierarchy (Ashraf, 2009). (Tsegay et al., 2013) in his study found out that the husbands and the mothers'-in-law make final decision pertaining their wives maternal health utilization. However, Fotso et al. (2008), showed women's decision making as a weak determinant in maternal health utilization among women in Nairobi, Kenya.

xi. Religion

As certain beliefs don't accept modern medicine, their supporters do not seek health care, and is chiefly attributable to fear of probable outcomes if these traditions are not followed (Cheptum et al., 2014). People are expected to behave in a certain manner in different communities. A literature review of twenty-eight papers established that ideas and cultural beliefs on pregnancy affected the use of antenatal care (Simkhada et al., 2008).

xii. Health Insurance

This has a part in refining MMR and associated health issues. When a woman is covered by health insurance, catastrophic payments are reduced and health-seeking and usage behaviors improved. Also, it's related with ANC attendance and may possibly raise deliveries in health facilities attended by skilled health workers (Feijen-de Jong et al., 2011).

However, studies carried in Tanzania showed low coverage of health insurance was linked to low use in maternal services such as adequate ANC visits including deliveries by expert attendants (Kibusi et al., 2018).

xiii. Wealth Index

Wealth and health have long been considered as significant factors that affect the development of human capital, hence, the improvement of the standard of living of an individual. Woolf et al., (2015) establishes that "though it is easy to imagine how health is tied to wealth for the very poor or the very rich, the relationship between wealth and health is a gradient such that they are connected step-wise at every level of the economic ladder".

A study by Yaya et al., (2016) aimed to assess how household wealth disparity and education impacted use of maternal health services among Malawian women indicating wealth status had substantial effect on usage of all types of maternal health services. Women of higher quintile pose significantly greater odds of getting at least four ANC visits, expert birth attendance and attending PNC (Yaya et al., 2016).

xiv. Fertility Risk

Women with previous births who had complications or younger and elder women at risk of pregnancy and its outcome are explained by fertility risk. They have greater likelihood of using maternal health care services because of heightened risk of fertility according to external criteria (Letamo and Rakgoasi 2003).

xv. Use of prior services in the continuum of care

Women who receive ANC services have better likelihood of delivering in health facility and also women who receive ANC services and have health facility births have higher chances of receiving timely post-delivery services. It's because an essential component for quality ANC is counselling on importance of health facility delivery. Antenatal care and health facility delivery also offer chances for additional health concerns to be identified hence may serve as proxies for medical diagnosis (Mbugua and MacQuarrie 2018).

2.4 Relationship between Maternal Health and Maternal and Child Mortality

Ensuring availability of trained health workers and their access to a 24-hour emergency obstetric care by improving the health systems and primary healthcare is a chief essential way of averting maternal deaths. Annually, more than 68,000 women die from unsafe abortion, by making family planning services affordable and accessible the maternal morbidity and mortality can be reduced by 30%. Family planning services prevents unwanted pregnancies. Also, safe abortion should be allowed by the law and post-abortion care services to reduce the deaths and injuries caused by unsafe abortion (Berhane, 2005).

Maternal health is a key pointer of overall health in any environment. Expectant women, infants as well as younger children are more vulnerable to infections compared to any other

demographic. However, they are also the most needy and least influential members of society, therefore having more need of care and devotion compared to others. (Us et al., 2019).

2.5 Conceptual Framework

Andersen and Newman Framework of Health Services Utilization (Andersen and Newman, 2005) was employed in the study. The framework's purpose is to determine situations which either enable or deter health care use.

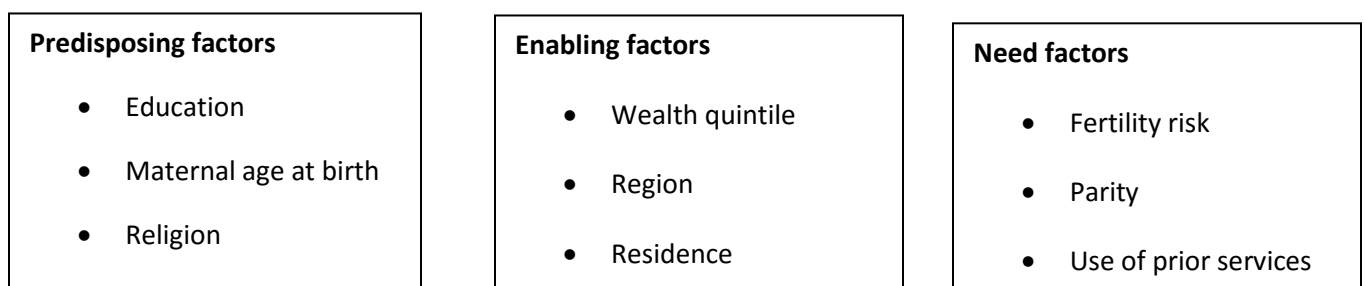
The model considers three characteristics: predisposing, need and the enabling factors to be an individual's usage and access of health services. Predisposing factors are socio-cultural features of people present before their disease. They are such as; culture, ethnicity, education, occupation, age, gender, knowledge on health care systems, values and attitudes.

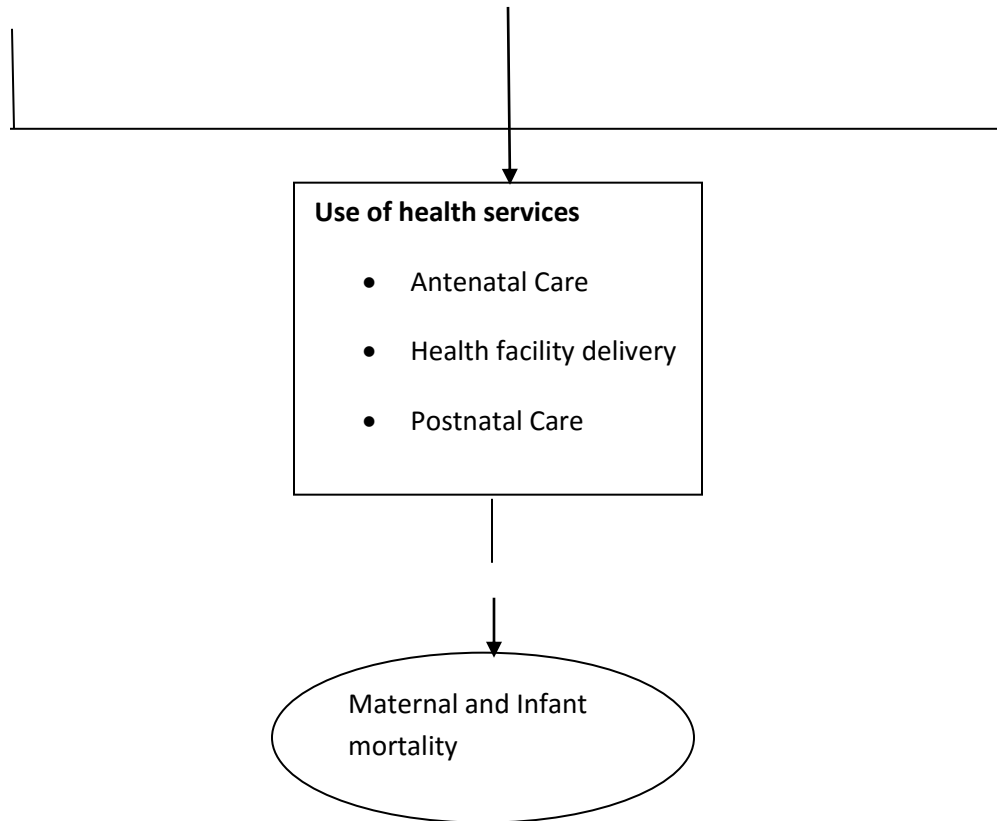
Enabling factors are aspects of attaining care logistically. In this study the enabling factors are wealth quintile, residence, health insurance and employment status. Urban and rural communities have inequalities in health provision due to physical ease of access of health services. For most cases, urban areas have more services in comparison to rural since they are closer to the good quality health services (Mbugua and MacQuarrie 2018).

Need factors are the main reasons as to why to use the health services. The perceived needs and evaluated needs are the need factors. Perceived needs are magnitude of the health concern and self-judgments of the urgency to pursue health care. Need of medical care based on objective criteria, physical exam and clinical diagnosis are the valuated needs.

The Andersen model is adopted and modified and the framework is applied to understand maternal health use as well as issues related to them. Using adjusted and unadjusted odds ratio analysis, this study will look at these factors and their relationship with adequate prenatal, delivery and postpartum care services.

Figure 2. 1 Conceptual framework





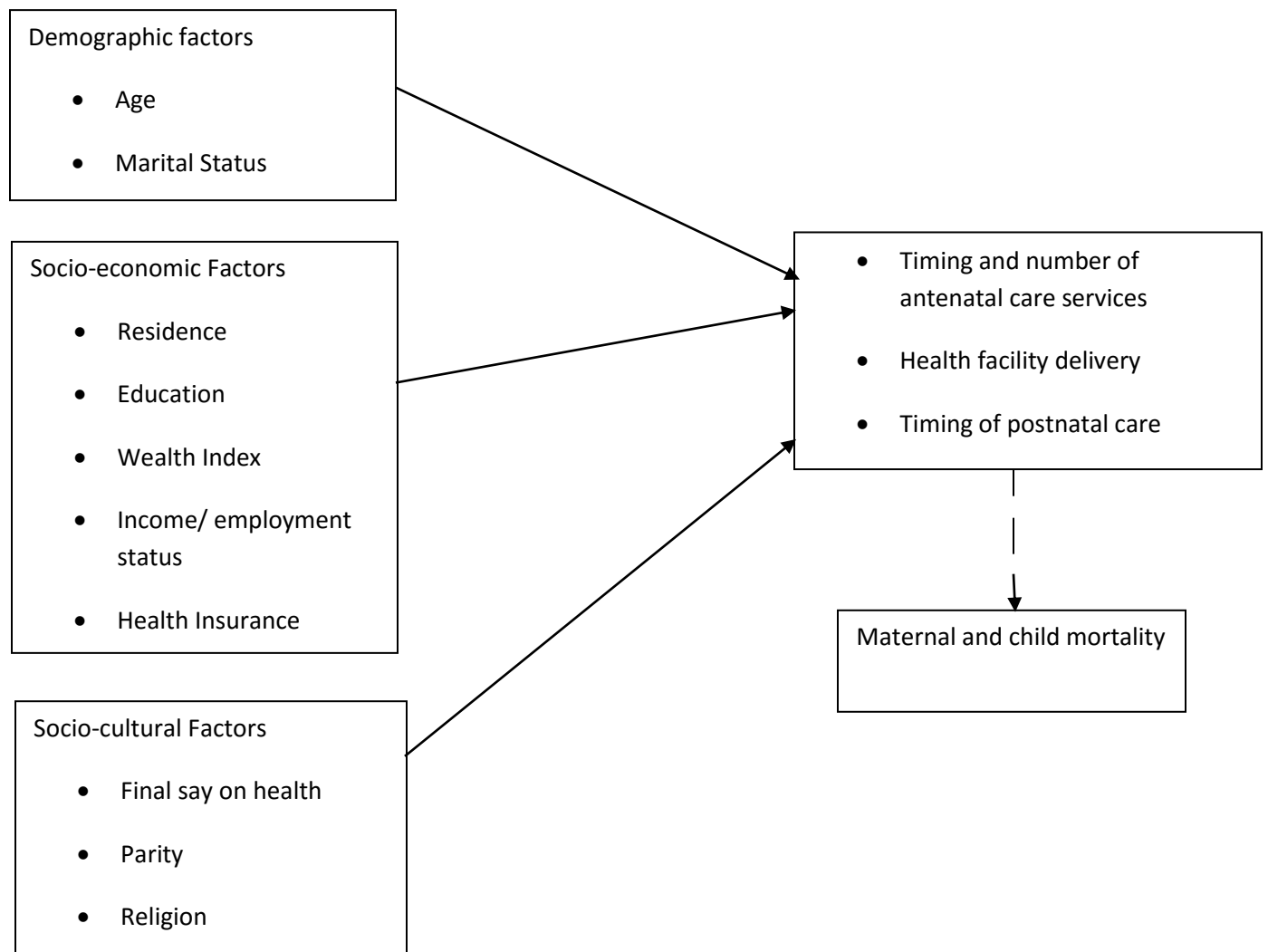
Adapted from Andersen and Newman Framework of Health Services Utilization (2005)

2.6 Operational Framework

This study will use operational framework as modified from Andersen and Newman (2005). The dependent variables are timing and of frequency of prenatal care visits, delivery in the health facility and timely post-delivery care services within two days after delivery.

The predictor variables will be grouped under socio-economic, demographic and socio-cultural. The demographic factors are age and marital status. The socio-economic variables are residence, education, wealth index, employment status and health insurance and the socio-cultural factors are final say on health, religion and parity.

Figure 2. 2 Operational framework of the study



CHAPTER THREE: METHODOLOGY

3.1 Introduction

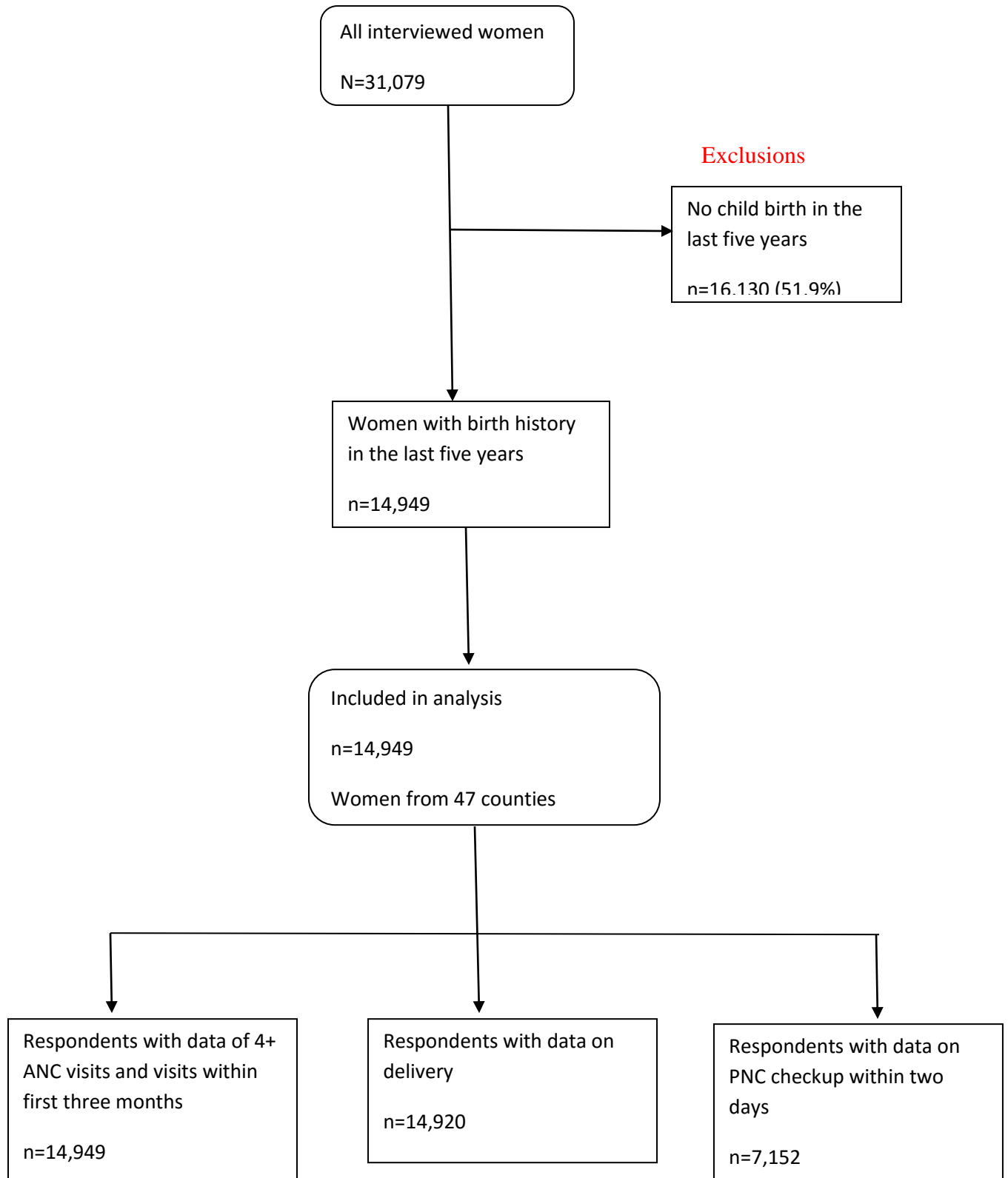
The chapter sketches the data for use in the study as well as methodology to be used for analysis. It also contains data's characteristics and quality.

3.2 Data Source

Data from Kenya Demographic and Health Survey (2014) was utilized in the study. The respondents were females aged 15-49 years with live birth for five years preceding the study who were 14,949 women in total.

Data was screened for both sampling and non-sampling errors. The latter arise mainly because of challenges in administering the questionnaire. Some of the examples of non-sampling errors include: Not being able to find and interview the right household, misunderstanding of the interview question among others. On the other hand, sampling errors arise due to challenges in sample selection process. For instance, the selected sample for the 2014 KDHS is one among many possible samples with equal likelihood of selection. This type of error is best evaluated statistically using statistical tools. Depending on the actual sample selected, other equally likely samples would yield different results but the findings are expected to be the same.

Figure 3. 1 Sample selection flow diagram



3.3 Variables

Adequate ANC use, health facility delivery and timely PNC are the outcome variables. Table 3.1 shows definition of dependent variables as well as population base.

Table 3. 1 Definition of dependent variables

Indicator	Description	Population
Prenatal care use	Proportion of females who received at least four ANC visits throughout their pregnancy including the first three months.	Women age 15-49 with a live birth in the five years preceding the survey
Health facility delivery	Proportion of women who delivered in a health facility	Women age 15-49 with a live birth in the five years preceding the survey
Timely PNC	Proportion of women who within 48 hours after delivery received a PNC checkup.	Women age 15-49 with a live birth in the five years before the survey

Table 3. 2 Independent variables and their measurement

VARIABLE	VALUES	Variable Type
Maternal age	1=15-19 2=20-29 3=30-39 4=40-49	Independent
Type of place of residence	1= Urban 2= Rural	Independent
Education level	1= No education 2= Primary 3= Secondary+	Independent
Wealth Index	1= Poor 2= Middle 3= Rich	Independent
Covered by health insurance	1= Yes 2=No	Independent
Health care final say	1= Respondent 2= Respondent and partner 3= Respondent and other person 4=Husband/ partner 5= Other	Independent

Marital status	1= Never married 2= Married 3=Living together 4= Widowed 5= Divorced 6= Not living together	Independent
Employment Status	1= Yes 2= No	Independent
Parity	1=<2 2=2+	Independent
Religion	1= Catholic 2= Protestant 3= Other	Independent

3.4 Method of Analysis

Data was analyzed using IBM SPSS Statistics 22 tool. Since most of the variables are categorical, frequencies and percentages was used to present the descriptive statistics alongside 95% confidence intervals.

The test of association between the outcome variables and predictor variables was done through fitting an unadjusted logistic regression model. In the multivariate analysis, while controlling for each factor, an adjusted binary logistic regression model was fit. Models of every outcome specified similar sets of predisposing factors (maternal age, education, marital status and religion), enabling factors (wealth, residence, employment status and health insurance), and need factors (parity, final say on health).

This is an additive model for the three outcomes. For example, birth in a health facility model includes measurement of adequate prenatal care and also the model of timely postpartum care services includes the measurement of adequate prenatal care services and delivering in a health facility. We can assess the contribution of experience with the preceding stages of health care use—which is also a need factor variable—but also to indirectly evaluate magnitude to which consequences have similar sets of socio-demographic determinants or extent to which those factors act indirectly through their effect on prior steps of care seeking.

$$Y = e^{(\beta_0 + \beta_1 X + \dots)} / (1 + e^{(\beta_0 + \beta_1 X + \dots)})$$

Whereby, Y is the outcome to be predicted, β_0 is the intercept/bias term and β_1 is the coefficient for the single input value of the characteristic/predictor X.

For this study, the logistic regression equation will be represented as:

$$M = \frac{e^{(\beta_0 + \beta_1 D + \beta_2 A + \beta_3 R + \beta_4 E + \beta_5 W + \beta_6 S + \beta_7 P + \beta_8 H + \beta_9 I + \beta_{10} Re)}}{1 + e^{(\beta_0 + \beta_1 D + \beta_2 A + \beta_3 R + \beta_4 E + \beta_5 W + \beta_6 S + \beta_7 P + \beta_8 H + \beta_9 I + \beta_{10} Re)}}$$

Where:

- M = maternal health,
- D = Decision making on own Health,
- R = Residence,
- A = Maternal age
- E = Education level,
- W = Wealth index
- S = Marital status
- P = Parity
- H = Health Insurance
- I = Income/ employment status
- Re = Religion
- β_0 = Intercept/bias term, and
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = weights/coefficients for the respective predictor variables

CHAPTER FOUR: RESULTS

4.1 Sample Characteristics

According to table 4.1, more than half (63.3%) of the respondents are aged between 20-29 years and over three-quarters (86.5%) have above primary level of education. Majority of the women are married (61.3%) and belong to the Protestant religion (63.4%). More than half of these women reside in rural areas (65.5%) and half of them belonging to poor wealth quintile (50.6%). Slightly more than half of the women are employed (61%) and are not covered by health insurance (85.8%). Over three-quarters (84.4%) of the respondents have more than one child. Majority of the women (75.2%) are entangled in making choices concerning their health.

Table 4. 1 Characteristics of respondents

Characteristics	Number	Percentage
Predisposing Factors		
Maternal age		
15-19	889	5.9
20-29	7779	52
30-39	5021	33.6
40-49	1260	8.4
Education level		
None	2790	18.7
Primary	7843	52.5
Secondary+	4316	28.9
Marital status		
Never married	1164	7.8
Married	12332	82.5
Widowed	378	2.5
Divorced/separated	1075	7.2
Religion		
Catholic	2873	19.2
Protestant	9474	63.4
Other	2602	17.4
Enabling Factors		
Residence		
Urban	5164	34.5
Rural	9785	65.5
Wealth quintile		
Poor	7562	50.6
Middle	2628	17.6

Rich	4759	31.8
Employment status		
Employed	4369	61
Not employed	2798	39
Health Insurance		
Covered	1017	14.2
Not covered	6157	85.8
Need Factors		
Parity		
1 Child	3235	21.6
2-3 Children	5468	39.6
4+ Children	6246	44.8
Health decision		
Respondent alone	2075	35.1
Respondent and partner/someone else	2366	40.1
Partner alone	1446	24.5
Someone else	18	0.3

4.2 Factors Associated with Antenatal care Usage

Females who accessed adequate prenatal care is represented in Table 4.2. Only 18% of the women received ANC services in first trimester and at least four visits in the pregnancy. By predisposing characteristics, women aged between 20-29 years (20%), women with secondary plus education (26%), who were married (47%) and belong to the catholic religion (20%) have the highest ANC usage. Regarding enabling factors, women in the urban areas (24%) who belonged to the rich wealth quintile (48%) had high rates of ANC usage. Employed women (17.1%) covered by health insurance (28.1%) used ANC services. According to need factors, women with less than two births (23%) and women whose health decision was made by someone else (33%) had high proportions of women using ANC services.

Table 4. 2: Predisposing, enabling and need factors characteristics of ANC users

Characteristics	Number	Percentage	Pearson chi-Square	P-value
Total	14949	18.1		
Predisposing Factors				
Maternal age			20.869	0.000
15-19	2264	16.9		
20-29	7573	19.7		
30-39	4128	16.3		
40-49	584	14.2		
Education level			266.553	0.000
None	2790	10.7		
Primary	7843	14.4		
Secondary+	4316	25.7		
Marital status			2.401	0.493
Never married	4731	31.6		
Married	8969	46.7		
Widowed	349	4.9		
Divorced/separated	900	12.6		
Religion			65.369	0.000
Catholic	2873	19.6		
Protestant	9474	18.4		
Other	2576	13.5		
Enabling Factors				
Residence			130.548	0.000
Urban	5164	23.8		
Rural	9785	14.5		
Wealth quintile			253.698	0.000
Poor	7562	25.6		
Middle	2628	15.0		
Rich	4759	48.2		
Employment status			6.824	0.009
Employed	8753	17.1		
Not employed	6196	14.7		
Health Insurance			125.648	0.000
Covered	2290	28.1		
Not covered	11959	14.2		
Need Factors				
Parity			133.004	0.000
1 Child	3235	22.6		
2-3 Children	5468	17.5		
4+ Children	6246	13		

Health decision			7.381	0.061
Respondent alone	4488	15.2		
Respondent and partner/someone else	5980	17.2		
Partner alone	2990	15.6		
Someone else	1491	33.3		

4.2.1 Bivariate logistic regression analysis (unadjusted)

Findings in bivariate distributional analysis are echoed by the unadjusted odds ratio analysis as presented in table 4.3. Using separate bivariate models, the predisposing factors significantly relating to ANC services are mother age, learning status, marital status as well as religion. Adequate use of ANC is found to be high among women 20-29 (OR 1.7, CI 1.2-2.2) relating to the older ones. There is no significant difference in ANC care-seeking behavior among women aged below 20 years, women aged between 30-39 and women aged 40-49.

A significant affirmative link exists between learning and ANC use: Greater odds of adequate ANC utilization is among women with basic (OR 1.5, CI 1.2-1.8) and tertiary education (OR 2.7, CI 2.1-3.3) in relation to those without.

Compared to other religions, women who belong to the catholic (OR 1.8, CI 1.4-2.2) and protestant (OR 1.5, CI 1.2-1.8) religion have greater odds of adequate ANC usage.

Rural residents may not use ANC services in relation to women in town residence (OR 1.8, CI 1.6-2.1). Wealth quintile are three times as much to utilize enough ANC services in comparison to those in poor quintile. Unemployed women who are not insured have greater odds of adequate ANC in relation to working women (OR 0.9, CI 0.8-1.1) and covered by health insurance (OR 0.4, CI 0.4-0.5).

Women with low parity are 1.3 times likelier to use these services (OR 1.3, CI 1.4-1.9) in comparison to with two or more children. Women who involve their partners or someone else in making decisions about their health are 1.7 as much to utilize ANC services (OR 1.7, CI 1.3-2).

Table 4. 3: Antenatal care use unadjusted odds ratio

Characteristics	B	S.E	Sig	Exp (B)	95% CI	
					Lower	Upper
Predisposing Factors						
Maternal age						
15-19	0.18	0.25	0.32	1.2	0.98	1.81
20-29	0.41	0.16	0.62	1.7	1.23	2.18
30-39	0.18	0.15	0.48	1.2	0.90	1.60
40-49	RC		0.73			
Education level						
None	RC		0.03			
Primary	0.34	0.13	0.02	1.5	1.22	1.83
Secondary+	1.06	0.15	0.00	2.7	2.06	3.27
Religion						
Catholic	0.47	0.14	0.01	1.8	1.35	2.20
Protestant	0.34	0.13	0.02	1.5	1.18	1.95
Other	RC		0.02			
Enabling Factors						
Residence						
Urban	0.59	0.09	0.00	1.8	0.634	0.89
Rural	RC					
Wealth quintile						
Poor	RC					
Middle	0.43	0.11	0.83	1.4	1.24	1.71
Rich	1.19	0.10	0.00	3.3	2.85	4.91
Employment status						
Employed	-0.11	0.08	0.73	0.9	0.878	1.21
Not employed	RC					
Health Insurance						
Covered	-0.92	0.10	0.00	0.4	1.312	1.92
Not covered	RC					
Need Factors						
Parity						
1 Child	0.41	0.13	0.00	1.5	0.403	0.67
2-3 Children	-0.11	0.10	0.17	0.9	0.716	1.06
4+ Children	RC		0.00			

4.2.2 Multivariate logistic regression analysis (adjusted)

Issues which remain statistically significantly associated with adequate use of ANC after adjusting for other factors are; education level, wealth quintile, health insurance and parity. This has been illustrated in table 4.4 below.

Women with secondary plus level of education are 1.5 times as likely to receive adequate prenatal care (AOR 1.5, 1.1-2.0) compared with women who have no education. Females with primary education level and women with no education have no significance difference in attaining adequate ANC.

Women in rich households are twice as likely to receive adequate ANC services (AOR 2.1, 1.7-2.8) in comparison to those in the poor wealth quintile. There is almost a similarity between middle class women (AOR 1.1, CI 0.9-1.4) and those in the poor wealth quintile. Women covered by health insurance are two times more likely (AOR 2.3, CI 2-2.7) to utilize ANC services compared to women with no insurance.

Compared with those who have more than two children, women with one child receive adequate ANC (AOR 1.3, CI 1.1-1.5).

In the multivariate model, some factors such as maternal age, marital status, religion, residence, employment status, and final say on health lost their statistical significance.

Table 4. 4: Antenatal care use adjusted odds ratios

Characteristics	B	S.E	Sig	Exp (B)	95% CI	
					Lower	Upper
Predisposing Factors						
Maternal age						
15-19	-0.22	0.25	0.01	0.8	0.5	1.1
20-29	-0.11	0.16	0.60	0.9	0.7	1.3
30-39	-0.11	0.15	0.00	0.9	0.7	1.3
40-49	RC		0.01			
Education level						
None	RC		0.00			
Primary	0.02	0.13	0.00	1.0	0.8	1.3
Secondary+	0.41	0.15	0.00	1.5	1.1	2.0
Religion						
Catholic	0.04	0.14	0.00	1.0	0.7	1.4
Protestant	0.03	0.12	0.07	1.0	0.7	1.4
Other	RC		0.06			
Enabling Factors						
Residence						
Urban	0.04	0.09	0.00	1.0	0.9	1.2
Rural	RC					
Wealth quintile						
Poor	RC		0.00			
Middle	0.10	0.11	0.07	1.1	0.9	1.4
Rich	0.74	0.10	0.00	2.1	1.7	2.8
Employment status						
Employed	0.13	0.08	0.16	1.1	0.9	1.2
Not employed	RC					
Health Insurance						
Covered	0.83	0.10	0.00	2.3	2.0	2.7
Not covered	RC					
Need Factors						
Parity						
1 Child	0.26	0.13	0.00	1.5	1.3	1.7
2-3 Children	-0.36	0.10	0.00	0.7	0.6	0.8
4+ Children	RC		0.00			

4.3 Facility Delivery

According to 2014 KDHS, 66% of women gave birth in a health facility (Table 4.5). Compared with all other age groups, the lowest rates of delivering in a health facility are among women older than 40 years (48%). More than three-quarters (86%) of women with secondary plus level of education delivered in a health facility. Women who have never been married have the highest rates (69.3%) of health facility delivery compared to married, widowed or separated women. The women belonging to the catholic and protestant religion have higher rates of facility delivery (69.7% and 67.6% respectively) compared to other religions.

For the enabling factors, a higher percentage of urban residents (84.3%) delivered in a health facility in comparison to the rural women. This is similar those who belong in the rich wealth quintile where 93% had health facility delivery. Women who are employed (60.9%) and are covered by health insurance (86.2) have higher rates of facility delivery.

For need factors, women with low parity (84%) and women who obtain adequate ANC (80%) delivered in a hospital in comparison to others.

Table 4. 5: Distribution of hospital birth across predisposing, enabling, and need factors

Characteristics	Number	Percentage	Pearson chi-Square	P-value
Total	14949	66.1		
Predisposing Factors				
Maternal age			142.167	0.000
15-19	2664	68.5		
20-29	7573	69.2		
30-39	4128	60.5		
40-49	584	48		
Education level			2441.747	0.000
None	2790	27.7		
Primary	7843	59.6		
Secondary+	4316	86.4		
Marital status			114.318	0.000
Never married	4731	69.3		
Married	8969	55.8		
Widowed	349	40.9		
Divorced/separated	900	58		
Religion			455.177	0.000
Catholic	2873	69.7		
Protestant	9497	67.6		

Other	2576	47.1		
	Enabling Factors			
Residence			1053.137	0.000
Urban	5164	84.3		
Rural	9785	54.7		
Wealth quintile			2519.942	0.000
Poor	7562	53.3		
Middle	2628	65.4		
Rich	4759	93		
Employment status			68.409	0.000
Employed	8753	60.9		
Not employed	6196	50.7		
Health Insurance			369.625	0.000
Covered	2290	86.3		
Not covered	11959	52.3		
	Need Factors			
Parity			1894.407	0.000
1 Child	3235	78.6		
2-3 Children	5468	61.2		
4+ Children	6246	38.3		
Health decision			61.947	0.000
Respondent alone	4488	59.9		
Respondent and partner/someone else	5980	58		
Partner alone	2990	47.2		
Someone else	1491	76.5		
ANC Use			204.952	0.000
Yes	2341	79.7		
No	12579	63		

4.3.1 Bivariate logistic regression analysis (unadjusted)

Table 4.6 shows an inverse relationship between the age of the woman and health facility delivery. Women aged 15-29 are two times as likely to deliver in a health facility (OR 2.4) and women aged 30-39 have 1.7 higher odds of health facility delivery compared to older women (40-49 years). Women with more than secondary level of education are sixteen times more likely to deliver in a health facility (OR 16.7, CI 13.5-20.6) compared to women who have no education. Catholic (OR 2.6, CI 2.1-3.2) and protestant (OR 2.3, CI 2.0-2.8) religion women have two times greater odds of health facility delivery.

In enabling factors, women in urban residents are four times more likely to deliver in a health facility (OR 4.4, CI 3.9-5.1) compared to those living in the rural. The household wealth index and the hospital odds increases significantly. The household wealth index and the hospital odds increases significantly. The rich wealth quintile have the highest odds of health facility delivery (OR 28.9, CI 20.7-33.7). Employed women have three times greater odds of facility delivery (OR 3.3, CI 0.6-0.8) and women covered by health insurance have twenty times greater odds to deliver in a health facility compared to those not covered by health insurance (OR 20.9, CI 15.6-25.8).

Women with low parity have 3.6 greater odds of health facility delivery (OR 3.6, CI 3.5-4.4) compared with women with two or more children Women who are involved in decision making about their health are two times more likely to deliver in a health facility (OR 2.4, CI 1.9-3.9). Women who obtain adequate ANC during pregnancy are two times more likely to deliver in a health facility (OR 2.3, CI 2.0-2.6) compared with those who did not receive adequate ANC.

Table 4. 6: Health facility delivery unadjusted odds ratios

Characteristics	B	S.E	Sig	Exp (B)	95% CI	
					Lower	Upper
Predisposing Factors						
Maternal age						
15-19	0.88	0.22	0.03	2.4	1.93	3.08
20-29	0.88	0.13	0.01	2.4	1.92	3.15
30-39	0.53	0.12	0.12	1.7	1.34	2.10
40-49	RC		0.02			
Education level						
None	RC		0.00			
Primary	1.34	0.10	0.00	3.8	3.24	4.60
Secondary+	2.82	0.13	0.00	16.7	13.52	20.2
Religion						
Catholic	0.96	0.12	0.77	2.6	2.13	3.23
Protestant	0.83	0.10	0.61	2.3	2.04	2.82
Other	RC		0.87			
Enabling Factors						
Residence						
Urban	1.48	0.08	0.00	4.4	3.94	5.13
Rural	RC					
Wealth quintile						
Poor	RC		0.00			

Middle	1.31	0.08	0.00	3.7	3.20	4.40
Rich	3.36	0.10	0.00	28.9	20.71	33.71
Employment status						
Employed	1.19	0.07	0.04	3.3	0.59	0.81
Not employed	RC					
Health Insurance						
Covered	3.04	0.12	0.00	20.9	15.61	25.78
Not covered	RC					
Need Factors						
Parity						
1 Child	1.13	0.13	0.00	3.6	3.54	4.43
2-3 Children	0.59	0.08	0.00	1.8	0.87	1.28
4+ Children	RC			0.00		
Health decision						
Respondent alone	0.53	0.69	0.00	1.7	1.31	2.10
Respondent and partner/someone else	0.88	0.69	0.03	2.4	1.89	3.13
Partner alone	-0.22	0.69	0.07	0.8	0.61	1.48
Someone else	RC		0.02			
ANC Use						
Yes	0.83	0.09	0.00	2.3	2.02	2.59
No	RC					

4.3.3 Multivariate logistic regression analysis (adjusted)

Among the predisposing factors, maternal age and religion lose their significance in the multivariate analysis (Table 4.7). The level of education increases significantly with health facility delivery. Women with primary education (AOR 2.3, CI 1.9-2.9) and women with higher than secondary education (AOR 4, CI 3.1-5.1) have two and four times higher odds of health facility delivery respectively.

Among enabling factors, wealth, residence, employment status and health insurance coverage remain significantly associated with facility delivery. There is positive association among urban residents compared with rural residents in health facility delivery (AOR 1.6, CI 1.7-2.2). Increasing levels of household wealth also increases with the odds of health facility delivery systematically. Women in the rich households have 8.3 greater odds of health facility delivery (AOR 8.3, CI 4.4-8.8). Compared to unemployed women, employed women are 5.7 more likely to have health facility births (AOR 5.7, CI 1.4-1.7) and women covered by health insurance are

six times more likely to give birth in a health facility (AOR 6.9, CI 4.7-8.5) compared to those with no insurance.

Women with one child (AOR 2.1, CI 1.4-1.8) and women who receive adequate prenatal care services (AOR 1.9, CI 1.7-2.2) have higher odds of health facility delivery compared with their referent group.

Table 4. 7: Adjusted odds ratios for health facility delivery

Characteristics	B	S.E	Sig	Exp (B)	95% CI	
					Lower	Upper
Predisposing Factors						
Maternal age						
15-19	-0.11	0.22	0.66	0.9	0.7	1.2
20-29	0.18	0.13	0.50	1.2	0.9	1.5
30-39	0.18	0.12	0.18	1.2	0.9	1.5
40-49	RC		0.06			
Education level						
None	RC		0.00			
Primary	0.74	0.10	0.00	2.3	1.9	2.9
Secondary+	1.39	0.13	0.00	4	3.1	5.1
Religion						
Catholic	0.19	0.12	0.21	1.2	0.9	1.5
Protestant	0.10	0.10	0.12	1.1	0.9	1.4
Other	RC		0.09			
Enabling Factors						
Residence						
Urban	0.34	0.08	0.00	1.6	1.7	2.2
Rural	RC					
Wealth quintile						
Poor	RC		0.00			
Middle	0.79	0.08	0.00	2.2	1.9	2.6
Rich	1.99	0.10	0.00	8.3	4.4	8.8
Employment status						
Employed	1.74	0.07	0.00	5.7	1.4	1.7
Not employed	RC					
Health Insurance						
Covered	1.90	0.12	0.00	6.9	4.7	8.5
Not covered	RC					
Need Factors						
Parity						
1 Child	0.69	0.13	0.00	2.1	1.4	1.8

2-3 Children	0.26	0.08	0.00	1.3	1.1	1.4
4+ Children	RC		0.00			
Health decision						
Respondent alone	0.10	0.69	0.11	1.1	0.8	1.4
Respondent and partner/someone else	0.18	0.69	0.09	1.2	0.9	1.5
Partner alone	-0.92	0.69	0.06	0.4	0.7	1.2
Someone else	RC		0.08			
ANC Use						
Yes	0.47	0.09	0.00	1.9	1.7	2.2
No	RC					

4.4 Postnatal Care

According to Table 4.8, the percentage of females who received timely PNC is 55%. Among the predisposing factors, women aged 15-19 and age 20-29 had higher proportions of women (57%) who received PNC services within 48 hours after delivery compared with women of age 40-49 (42%). Women with secondary plus education (71%), married women (82%) and women in the protestant religion (57%) received timely PNC.

Regarding enabling factors, (67%) of urban resident women and women in the rich wealth quintile (74%) received timely PNC. Employed women (41.1%) have higher use of PNC unemployed women and also women who are covered by health insurance have higher use of PNC (76%).

Among need factors, women with less than two children (62%), women who receive adequate prenatal care services (64%) and females who gave birth in a hospital (74%) received timely PNC.

Table 4. 8: Predisposing, enabling and need factors distribution of timely postnatal care services

Characteristics	Number	Percentage	Pearson chi-Square	P-value
Total	7152	54.9		
Predisposing Factors				
Maternal age			5.917	0.116
15-19	1237	57		
20-29	2639	56.2		
30-39	2007	52.9		
40-49	279	41.7		
Education level			156.841	0.000
None	1327	24.4		
Primary	3779	50.5		
Secondary+	2046	70.1		
Marital status			12.065	0.007
Never married	1756	79.6		
Married	2757	82.4		
Widowed	971	80.4		
Divorced/separated	1668	79.3		
Religion			33.886	0.000
Catholic	1400	55.9		
Protestant	4501	56.7		
Other	1249	39.7		
Enabling Factors				
Residence			45.99	0.000
Urban	2507	67		
Rural	4645	47.2		
Wealth quintile			158.375	0.000
Poor	3594	49.9		
Middle	1257	52.1		
Rich	2301	74.2		
Employment status			58.013	0.000
Employed	4369	41.1		
Not employed	2783	32.1		
Health Insurance			104.614	0.000
Covered	2240			
Not covered	4912			
Need Factors				
Parity			50.796	0.000
1 Child	1535	61.8		

2-3 Children	2240	54.8		
4+ Children	3377	48		
Health decision			20.045	0.000
Respondent alone	919	53		
Respondent and partner/someone else	4780	58		
Partner alone	870	33		
Someone else	583	41		
Antenatal care			41.234	0.000
4+ ANC visits	1147	63.9		
Less than four visits	6005	52.9		
Place of delivery			375.291	0.000
Health facility	4209	73.5		
Other	1249	39.7		

4.4.1 Bivariate logistic regression analysis (unadjusted)

There is a significant association between all the predisposing factors and timely PNC (Table 4.9). Relating to women aged 40 and above, women aged 15-19 are 1.9 times more likely to receive timely PNC (OR 1.9, CI 1.3-2.6). Women with primary (OR 3.2, CI 2.6-3.9) and secondary+ education (OR 7.3, CI 5.7-9.3) have higher odds of receiving postpartum services within 48 hours after delivery than women without education. Widowed women (OR 2.0, CI 1.6-2.4) are two times more likely to get timely PNC relating with women who are not in union. Also, double the women in the protestant religion (OR 2.0, CI 1.6-2.4) receive timely PNC compared to other religion.

Timely PNC is associated with wealth quintile, residence, employment status and health insurance among the enabling factors. Urban resident women are twice more likely to receive timely PNC compared to rural residents women (OR 2.3, CI 1.9-2.7). Females in the rich wealth quintile have 6.1 greater odds of well-timed PNC (OR 6.1, CI 4.8-7.6) compared to women from poor households. Employed women (OR 6.5, CI 4.7-8.1) and those covered by health insurance (OR 2.6, CI 1.9-2.3) have higher odds of receiving timely PNC.

Among the need factors, women with at most one child (OR 1.9, CI 1.6-2.2), women who received adequate prenatal care services (OR 1.6, CI 1.3-1.9) and women had health facility births (OR 14.1, CI 11.5-15.5) have higher odds of receiving post-delivery services within 48 hours.

Table 4. 9: Unadjusted odds ratios for postnatal care use

Characteristics	B	S.E	Sig	Exp (B)	95% CI	
					Lower	Upper
Predisposing Factors						
Maternal age						
15-19	0.64	0.25	0.00	1.9	1.32	2.64
20-29	0.59	0.16	0.01	1.8	1.34	2.53
30-39	0.47	0.14	0.00	1.6	1.13	2.22
40-49	RC		0.04			
Education level						
None	RC		0.00			
Primary	1.16	0.13	0.00	3.2	2.61	3.90
Secondary+	1.99	0.15	0.00	7.3	5.74	9.34
Religion						
Catholic	0.64	0.14	0.04	1.9	1.53	2.53
Protestant	0.69	0.12	0.01	2.0	1.64	2.41
Other	RC		0.02			
Enabling Factors						
Residence						
Urban	0.83	0.09	0.00	2.3	1.90	2.73
Rural	RC					
Wealth quintile						
Poor	RC		0.01			
Middle	0.83	0.11	0.00	2.3	1.94	2.82
Rich	1.81	0.11	0.00	6.1	4.83	7.63
Employment status						
Employed	1.87	0.08	0.00	6.5	4.73	8.13
Not employed	RC					
Health Insurance						
Covered	0.64	0.11	0.01	2.6	1.93	2.31
Not covered	RC					
Need Factors						
Parity						
1 Child	0.64	0.14	0.00	1.9	1.55	2.22
2-3 Children	-0.11	0.10	0.03	0.9	0.74	1.14
4+ Children	RC		0.05			
Health decision						
Respondent alone	-0.92	0.73	0.04	0.4	0.34	0.73
Respondent and partner/someone else	-0.69	0.72	0.01	0.5	0.30	0.72

Partner alone	-1.61	0.73	0.05	0.2	0.14	0.41
Someone else	RC		0.03			
ANC Use						
Yes	0.47	0.10	0.00	1.6	1.30	1.91
No	RC					
Place of delivery						
Health facility	2.52	0.09	0.00	14.1	11.51	15.53
Other	RC					

4.4.2 Multivariate logistic regression analysis (adjusted)

Only one predisposing factors, few enabling factors and one need factors stayed statistically significant with receiving PNC within 48 hours after delivery. This is illustrated in Table 4.10 below.

As the education level increases, the odds of receiving PNC within 48 hours after delivery also increases. Women with primary (AOR 1.9, CI 1.6-2.6) and secondary plus (AOR 2.9, CI 2.2-3.8) have higher odds of receiving timely PNC compared to women with no education. When controlling for other variables, maternal age, marital status and religion are no longer associated with timely PNC.

Relative to those living in rural, women in towns (AOR 1.2, CI 2-1.4) have higher odds of timely PNC. Women in rich wealth quintile have 3.7 greater odds (AOR 3.7, CI 3.0-4.6) of timely PNC compared with poor wealth quintile. Employed women are two times greater likely to get PNC services within 2 days after birth (AOR 2.4, CI 1.9-3.5) compared to unemployed women.

Women with only one child have 1.5 greater odds of timely PNC (AOR 1.5, CI 1.3-1.9) compared to high parity women. Women delivered in hospital have highest odds (AOR 10.9, CI 8.9-12.6) of timely PNC in relation to those who gave birth somewhere else.

Table 4. 10: Unadjusted and adjusted odds ratios for postnatal care use

Characteristics	B	S.E	Sig	Exp (B)	95% CI	
					Lower	Upper
Predisposing Factors						
Maternal age						
15-19	0.12	0.25	0.04	1.1	0.7	1.6
20-29	0.10	0.16	0.14	1.1	0.7	1.6
30-39	0.28	0.14	0.79	1.3	0.8	1.8
40-49	RC		0.05			
Education level						
None	RC		0.00			
Primary	0.53	0.13	0.00	1.9	1.6	2.6
Secondary+	0.99	0.15	0.00	2.9	2.2	3.8
Religion						
Catholic	-0.22	0.14	0.04	0.8	0.6	1.2
Protestant	-0.11	0.12	0.02	0.9	0.7	1.2
Other	RC		0.02			
Enabling Factors						
Residence						
Urban	0.18	0.09	0.00	1.2	2	1.4
Rural	RC					
Wealth quintile						
Poor	RC		0.00			
Middle	0.47	0.11	0.03	1.6	1.3	1.9
Rich	0.1	0.11	0.00	3.7	3.0	4.6
Employment status						
Employed	0.88	0.08	0.00	2.4	1.9	3.5
Not employed	RC					
Health Insurance						
Covered	0.18	0.11	0.00	1.2	1	1.4
Not covered	RC					
Need Factors						
Parity						
1 Child	0.29	0.14	0.00	1.5	1.3	1.9
2-3 Children	0.13	0.10	0.02	1.1	0.7	0.9
4+ Children	RC		0.00			
Health decision						
Respondent alone	-0.09	0.73	0.15	0.9	0.6	1.5
Respondent and partner/someone else	0.66	0.72	0.07	1.9	0.6	1.4
Partner alone	-0.51	0.73	0.00	0.6	0.4	1
Someone else	RC		0.00			

ANC Use						
Yes	0.21	0.10	0.00	1.2	1	1.4
No	RC					
Place of delivery						
Health facility	2.32	0.09	0.00	10.9	8.9	12.6
Other	RC					

4.5 Summary of Findings

Maternal health is crucial for motherly and newborn survival however in Kenya the use of maternal health services is still low. In this study, we used the 2014 KDHS to look at the different elements affecting antenatal care use, health delivery services and timely PNC.

The factors were classified as predisposing, enabling and need factors. A strong factor amongst the predisposing in the utilization of maternal health services was education.

Education level was found to be significant for health facility delivery and PNC. Women with more than secondary education are more likely to use maternal health care services. Through education, women understand and follow recommendations (Hearld et al., 2018).

This study found marital status significant for health facility delivery. This finding is consistent with the finding of Adedokun and Uthman (2019) where marital status had a significant relationship with maternal health service use. Compared to married women, women who have never been in union had higher probability of not using maternal health services while giving birth. Lack of spousal support may be linked to the low usage of maternal health services among unmarried women which, contrarily, married women enjoy.

Religion was not found to be a significant factor in utilization of maternal health. Al-Mujtaba et al., (2016) study on evaluating religious influences on the utilization of maternal health services among Muslim and Christian women in north-central Nigeria, did not find any no significant role for Christian or Islamic religious beliefs in influencing maternal service uptake.

Among the enabling factors, urban residents were positively linked with only delivery in a health facility. Adedokun and Uthman, (2019) found rural residents to give birth more outside the health facilities. Females who live in the rural have few or inadequate health facilities unlike women in metropolitan areas. The health amenities found in rural areas may not have the

required health personnel or equipment for safe delivery. An additional challenge with rural residents is the traditional birth attendants who offer cheap and readily available services but they do not have the required experience of delivery care. The distance between the health facility and where the woman lives can be a challenge especially in health delivery, when the facility is far from the women and shortage of transport due to inaccessibility of the residence. A number of females may end up giving birth at home whereas in the process of looking for means of transport to the nearby hospital.

In this study, wealth index is a consistent and strong factor affecting delivery in the health facility and timely PNC hence most pronounced with regard to delivery in the health facility. Omollo (2016) mentions transportation cost, distance, and price of medicine as challenges to health facility visits. Women in the rich households had higher odds of maternal healthcare utilization related to those in the poor households. An argument by Nuamah et al., (2019) shows that women from poor families have difficulties in paying for the fee of healthcare compared with females from rich homes who have better exposure to retrieving information on maternal health plus also have the power to afford health care.

Employment status of the woman is a significant factor in health facility delivery and timely PNC. Working mothers are exposed at their work place to information on health. They are likely to make use of their funds on their own health. However, sometimes these employed women face challenges that reduce their opportunities for receiving antenatal care (Furuta and Salway., 2006)

In this study, health insurance was significant for ANC uptake, facility delivery and timely PNC. Women need health coverage throughout their lifespan to be able to access all the health care services. Women who lack health insurance will most likely delay or forgo prenatal care in the first trimester, and inadequate prenatal care is associated with higher rates of maternal mortality. (Nationalpartnership.org, 2019).

A negative association exists between parity and utilization of maternal health services. Very few older women utilize the maternal health services, this can be because they have gained experience and confidence from past pregnancies (Rurangwira et al. 2017). Other studies have argued that unless the pregnancy has complications, the woman prioritizes the competing needs with the available resources hence less maternal health care use (Mungai and Oleche 2016).

This study did not find final health decision as a significant factor to maternal health. Bouyou et al., (2013) had similar findings and concluded women can have reproductive health services without any significant change in her household position.

A direct determinant of health facility delivery is adequate ANC. Most women who attend ANC are advised on the importance of giving birth in a health facility. Also, a direct element of timely PNC is health facility delivery. According to the 2014 Ghana Demographic and Health Survey, 40% of the women received PNC services after 72 hours of delivery. Women who give birth in absence of a skilled birth attendant are advised to be checked within 24 hours after but most of these women miss out on these services (as well as those who had health facility births) (Nuamah et al., 2019).

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study is summarized and concluded herein. Summary and conclusions of outcomes on various selected indicators for maternal and child health are looked at the first section and policy implications and recommendations that will inform policy makers will be presented in the second section.

5.2 Conclusions

Maternal health promotes the health of woman thereby reducing maternal mortality. Due to the sluggish development in reducing maternal mortality, the Government of Kenya has subsequently introduced and implemented health-related policies such as free maternity care services as social and health welfare schemes to decrease financial costs pertaining to maternal health.

The SDG's new global framework has incorporated maternal and child health targets as continuous efforts are being made to curb their mortality rates. This study therefore focuses on the maternal healthcare utilization.

From the study, we can see a link in the three outcomes, from the multivariate analysis, through a set of common factors. Women's education is the common predisposing factor, enabling factors are wealth and residence and parity is the need factor. Also, there is a direct link between ANC use and delivery in health facility which is also linked to timely PNC. To be able to improve maternal health significantly, the government and other key players should invest in the above factors.

Adequate prenatal care services, health facility births and postpartum care services were proxied to reduce maternal and child mortality. These three indicators were selected in relation to the health-related SDG targets 3.1, 3.2 and 3.7. The contribution of the current study to the existing literature is that the study will serve as a basis for future studies on antenatal care. As Kenya prepares to incorporate new least requirement of at least eight visits by expectant mothers, the results from our estimations show that some more effective targeted policies and programs

towards education and poverty reduction will be needed to meet the new WHO guideline for reducing high rates of maternal and child deaths.

5.3 Policy Implications

The empirical results lead to some policy inferences and suggested outcomes. In general, these recommendations are aimed at refining maternal and child health as well as forming the basis for the implementation of the health-related SDG targets in Kenya.

From the findings of the study, in all the three outcomes, education was highly significant. Education intervention approaches and health promotion should be provided in regions with low literacy levels. As female education has become an important determinant in ANC, health facility delivery and timely PNC, more females should be encouraged to attain higher levels of education beyond the secondary level to enhance women empowerment and control of their health. More public education and sensitization should be encouraged on the need for mother and child health.

It is vital for government to increase household wealth in order to reduce poverty and also to achieve maternal health. Women from poor households would have to be empowered through education and alternative means of livelihood to improve upon their welfare which will facilitate health care utilization including maternal health care services. Also, government should improve accessibility to health by strengthening and effectively resourcing the NHIF will encourage more people to enroll to reduce the financial burden since it was a key indicator for non-use of maternal health care services. Contraceptive services should also be provided to decrease on parity.

Finally, maternal mothers ought to be heartened to effectively attend postnatal health care services. Postnatal care facilitates family and group support for the woman as well as provides an avenue to discuss and educate the woman on proper child care and development including breastfeeding, sleeping under treated mosquito net, keeping a healthy home environment amongst others (WHO, 2018b). Postnatal check will therefore help to curb this intolerable large number of preventable child deaths. Ethnographic and qualitative studies should be undertaken and target the factors in county-specific program to be able to understand how culture affects maternal health utilization.

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