

**UTILIZATION OF ANTENATAL CARE SERVICES BY PREGNANT WOMEN
IN THE FIRST TRIMESTER OF PREGNANCY IN KOSIRAI DIVISION, NANDI
COUNTY, KENYA**

BY

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**Thesis Submitted to the School of Public health in Partial Fulfilment for the Award
of Degree in Master of Public Health of Moi University.**

DECLARATION

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DEDICATION

I dedicate this work to all expectant mothers in need of reproductive health care services and to my Husband, Gilbert Magut and my children; Lindsay ,Joy and Kipruto.

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TABLE OF CONTENTS

DECLARATION..... 2

DEDICATION..... 3

ACKNOWLEDGEMENT..... 4

OPERATIONALIZED DEFINITION OF TERMS 9

LIST OF ABBREVIATIONS 9

ABSTRACT..... 12

CHAPTER ONE:INTRODUCTION 13

1.1 BACKGROUND..... 13

1.2 PROBLEM STATEMENT 16

1.3RESEARCH QUESTION 16

1.4 OBJECTIVES

 1.4.1 Main objective..... 13

 1.4.2 specific objective..... 13

15 JUSTIFICATION 17

1.6 SIGNIFICANCE OF THE STUDY 18

CHAPTER TWO: LITERATURE REVIEW..... 18

 2.1Maternal Mortality and Morbidity 18

 2.2Importance of ANC utilization

 2.3Uptakeof ANC services 24

 2.4 Factors affecting ANC utilization in the first trimester of pregnancy 24

 2.5 Theoretical Framework (Modified Andersen and Newman’ utilization of health services.....26

CHAPTER THREE: METHODOLOGY

 3.1 Study Area 31

 3.2Study population 31

 3.3Study design..... 31

3.4 Sample size	31
3.5 Sampling technique.....	339
3.6.1 Inclusion criterion	339
3.6.3 Limitations of study	29
3.7 Data management.....	29
3.7.1 Data collection.....	29
3.7.2Data Analysis	34
3.8 Dissemination of findings.....	31
3.9.Ethical considerations	35
CHAPTER FOUR: RESULTS	
4.1 Socio demographic characteristics of repondents.....	32
4.2 Factors associated with ANC utilization during the first trimester.....	41
4.3 Qualitative results.....	45
CHAPTER FIVE: DISCUSSION	
5.1 Level of utilization of ANC services.....	47
5.2 Socio cultural factors associated with utilization of ANC services in the first trimester.....	48
5.3 Institutional factors influencing ANC services.....	54
CHAPTER SIX: CONCLUSION AND RECOMMENDATION	
6.1 Conclusions.....	60
6.2 Recommendations.....	61
REFERENCES	61

APPENDICES

APPENDIX 1:Informed Consent.....	62
APPENDIX 2: Interviewer Adminstered Questionanaire.....	64
KIAMBATISHO 2: Mahojiano.....	69
APPENDIX3: Focus Group Discussion	74
KIAMBATISHO 3: Mahojiano wa Kundi Lengwa.....	75
APPENDIX 4:key Informant Interview.....	91
KIAMBATISHO 4: Mahojiano Kwa Mwenywe Maoni Kuu.....	83

OPERATIONALIZED DEFINITION OF TERMS

Adherence: The extent to which pregnant mothers utilise ANC services as prescribed by their health care providers. It includes attending at least four ANC visits

Antenatal care: Is a broad range of care during pregnancy that involves health promotion and preventive health services including nutritional support, detection and treatment of anaemia, TB, STI/HIV and malaria.

First trimester- The first twelve weeks of pregnancy

Focused antenatal care: It means that providers focus on assessment and actions needed to make decisions and provide care to each pregnant woman's individual situation.

Institutional factors: These are health facility and policy issues that affect uptake of ANC services and these include human resource capacity, working conditions, availability of medical supplies and equipment, among others.

Primigravida: Refers to a woman who is pregnant for the first time or who has been pregnant once.

Utilization: It is the ability to accept and/or use available antenatal care (ANC services) provided by skilled birth attendants for reasons related to pregnancy at least once during pregnancy.

LIST OF ABBREVIATIONS

ANC:	Antenatal Care
DMOH:	District Medical Officer of Health
PNC:	Post Natal Care
FANC:	Focused Antenatal Care
FGD:	Focus group discussion
KDHS:	Kenya Demographic Health Survey
KI:	Key Informant

MDGs: Millennium Development Goals

IREC: Institutional Research and Ethics Committee

UTILIZATION OF ANTENATAL CARE SERVICES BY PREGNANT WOMEN IN THE FIRST TRIMESTER OF PREGNANCY IN KOSIRAI DIVISION, NANDI COUNTY, KENYA

ABSTRACT

Introduction: Antenatal care (ANC) is an effective health intervention for preventing maternal morbidity and mortality. Early ANC booking and adherence to scheduled appointments optimizes this benefit. However, factors determining its utilization in Kosirai Division are not well documented.

Objectives: The study objectives were to determine the level of utilisation of ANC services and to describe socioeconomic, cultural and institutional factors associated with ANC utilization by women in the first trimester of pregnancy.

Methodology: This was a cross-sectional descriptive study involving use of quantitative and qualitative methods. Study population were all pregnant mothers within Kosirai division. Sample size comprised of 196 pregnant women. Stratified sampling was used to sample participants. Data was collected using an interviewer administered semi structured questionnaire, focus group discussions and key informant interviews. Quantitative data was coded, entered into Microsoft access and exported to Stata version 12 for analysis. Qualitative data was recorded in tapes using a digital recorder, transcribed, translated, consolidated into emerging key themes and analyzed using content analysis.

Results: Participants aged 15-24 and 35-49 years were 62(32%) and 98(50%), respectively. Majority (59%) were married and 28(14.4%) were employed. Two thirds of the respondents had attained at least a secondary level of education. Majority of the respondents were Christians, 191(99%). Up to 18(10%) respondents who utilized ANC services during first trimester failed to be offered ANC services due to various reasons such as lack of supplies, lack of staff, long waiting time, and bad attitude from the staff. The respondents who started ANC during the first trimester were 96 (52.2%). The mean gestational age at first ANC was 23±8.2 weeks. Public health facilities were mostly attended 180(94%). Husbands influence on utilization of ANC services were reported in 65%. The participants whose source of income was formal employment have 3 times, (OR=3.08 (1.07, 8.89)) increased chance of attending ANC during the first trimester

compared to those who are self-employed or have other sources of income ($p=0.04$). Focus group discussion and key informant interviews revealed that the utilization of ANC services in the first trimester in Kosirai division was very poor. It revealed that the main factors affecting uptake of ANC were poor health seeking behaviour, fear of HIV test, influence of traditional birth attendant, poor medical and laboratory supplies and poor ANC policy awareness.

Conclusion: The level of utilization of ANC services was (52.2%) compared to FANC (100%) model but higher than Kenya demographic health survey (15%). The mean gestational age for start of ANC was 23 weeks, several weeks after first trimester elapse. Except for source of income ($p=0.042$), there was no association between socio-cultural and institutional factors and uptake of ANC services.

Recommendation: Sensitize population and create awareness on importance of early ANC attendance. Emphasize the role of community leaders in empowering pregnant women to seek ANC services early. Stakeholders' engagement in early ANC attendance through education and sensitization.

CHAPTER ONE: INTRODUCTION

1.1.BACKGROUND

Globally, the utilization of ANC services differs among countries. Several studies have found the average gestational age at booking in developed countries to be as early as 13 weeks and the average number of ANC visits at 6 weeks (Al-Shamari *et al.*, 1994).

In Sub Saharan Africa, utilization of ANC services is low especially in hard to reach rural areas. In Tanzania, about half of all pregnant women first attend ANC during or before the fourth month of gestation (Anders *et al.*, 2008) while in rural Uganda, 57.7% of all ANC women initially visit clinic during the 2nd trimester and 33.5% during the 3rd trimester with 37.1% making at least four ANC visits (Kiwuwa & Mufubenga, 2008). In Ethiopia, 42.8% of the pregnant women make their first ANC visit in the 3rd trimester and 6.5% of all women attain the recommended four visits. In Kenya, 47% (KDHS 08-09) and 58% (KDHS 2014) of pregnant women make at least four or more antenatal visits.

The use of ANC varies between countries and in different settings within each country. In Sub-Saharan African countries for example, many women do not receive key recommended interventions during routine ANC including information on pregnancy, related complications, and importance of skilled delivery attendance (Magoma *et al.*, 2011). While the care and assistance women receive during pregnancy are key to avoiding maternal mortality (Chizoma, 2010) and their effectiveness are more notable where the general health status of women is poor (Ochako *et al.*, 2011), many populations still face challenges.

These challenges appear to plague not only the third world countries but also the first. Even in the more developed countries, goals such as the Healthy People 2010 which had a target of 90% of mothers starting ANC in the first trimester of pregnancy, have remained a mirage (Sondik *et al.*, 2010) so that the known benefits of ANC in preventing adverse pregnancy outcomes, when it is sought early in the pregnancy and is continued through delivery are not adequately achieved.

World Health Organization (WHO) figures indicate that the global maternal mortality rate stands at 400 per 100, 000 live births. It is estimated that 800 women die daily globally from preventable causes related to pregnancy and childbirth (WHO, 2010). Specifically, in 2010, 287,000 women died during pregnancy and child birth and 99% of these maternal deaths occurred in developing countries. The report further found that these deaths are higher in women living in rural areas and poorer communities (WHO, 2010).

Antenatal care (ANC) is the most effective health intervention for preventing maternal morbidity and mortality particularly in places where the general health status of women is poor (KDHS 2008-09). Its role in ensuring improved pregnancy outcome is no longer in doubt. Ensuring early booking for ANC and sustained adherence to schedule is known to optimize this benefit. However, although gestational age at first ANC visit is crucial in determining the achievement of Focused Ante Natal Care(FANC) and in enhancing the number of times a woman attends clinics during her pregnancy, and efforts are being put

to address this, it appears there are several proximate factors that are serving a challenge (KDHS 2008-09).

Factors associated with failure to initiate ANC early are fairly related between different countries and regions the globe over. In Kenya, rural women are less likely than their urban counterparts to get ANC. There are marked regional variations in ANC coverage in the country, with over one-quarter of women in North Eastern province not getting any care at all. Varies, women with higher education are much more likely to receive ANC, such that proportion of women who do not get the service declines steadily as education increases. One-quarter of women with no education get no ANC at all. Further, the wealthier a woman is the more likely she is to get the care. Surveys indicate that up to 83% of all women who receive ANC obtain the same from government facilities (KDHS 2008-09)

Low education, low economic status, exclusive use of private ANC and living in rural areas are the main factors associated with late utilisation of ANC services as related to the national recommendations (Tran *et al.*, 2012) Other factors such as parity and other socio demographic factors also play crucial roles (Nwagha *et al.*, 2008).

The FANC model recommends that the first antenatal visit occur within the first three months of pregnancy (12 weeks), and subsequent visits continue on a monthly basis through to the 28th week of pregnancy and two weekly thereafter until term. WHO also recommends that a woman without complications should have at least four ANC visits, the first of which should take place during the first trimester. In line with this, Kenya adopted this model of reduced number of antenatal visits, unless a woman has high risk pregnancy. This was with the aim of lowering ANC costs without having increased risk to mother or baby (Caroli *et al.*; 2001; FANC, 2007). Even so, not all women manage these four visits, citing a number of factors. Achievement has been found to increase proportionately, for instance, with a woman's education level (Sein, 2011).

Safe Motherhood campaigns, through independent FANC have been on-going in Kenya and ANC coverage has been placed at 92% (KDHS, 2008-09). Yet, worrying gaps exist in terms in different parts of the country and also amongst members of the same population. FANC is individualized antenatal attention given to each pregnant woman

who opts to seek ANC services. It aims to achieve lower maternal and infant mortalities during and immediately after pregnancy. A risk-free pregnant woman is expected to first visit the ANC clinic before the 12th week of pregnancy, then thereafter between the 16th and 28th week, between 28th and 32nd week, and lastly between the 32nd and 40th week (FANC, 2007)

This study therefore seeks to assess the utilization of antenatal care services in Kosirai division with the view of improving maternal health outcomes.

1.2 PROBLEM STATEMENT

Although Kenya has had some favourable strides in ANC services with 92% uptake, a number of challenges still exist. Significant proportion of pregnant women still make their first ANC visit way after the recommended 12th week of the pregnancy, averaging 5.2 months, and only 20% obtain this care in the first trimester and 52% by the sixth month of pregnancy. Further, 58% of all pregnant women achieve the minimum of four visits, and this has been noted to be on a downwards trend since 2003 (FANC 2007, KDHS 2014). Kenya records 400/100,000 maternal mortality rates and has been fluctuating over the years (WHO, 2013). Furthermore, approximately 6,300 pregnant women died in the year 2013 in Kenya and this is contributed by poor utilization of ANC services, among others.

Ouma *et al.*, (2010) shows that this has not been uniform across the country with up to half (47%) of all pregnant mothers from some Kenyan regions still attending ANC clinics only once or very late in their pregnancy (Delva *et al.*, 2010; van Eijk *et al.*, 2006). This exposes them to pregnancy related complications, including death.

It is imperative therefore, to find factors associated with utilization of ANC services in order to develop acceptable interventional measures that could enhance early ANC attendance and completion of recommended schedule.

1.3 RESEARCH QUESTION

1. What is the level of utilization of ANC services by pregnant women in their first trimester?

2. What are the factors associated with utilization of ANC services in the first trimester of pregnancy?

1.4 OBJECTIVES

1.4.1 Main objective

To determine the level of utilization and its associated factors that affects uptake of ANC services by women in first trimester of pregnancy in Kosirai division of Nandi County

1.4.2 Specific objectives

1. To determine the level of utilization of ANC services by pregnant women in their first trimester
2. To determine socioeconomic and cultural factors associated with utilization of ANC services in the first trimester of pregnancy
3. To assess the institutional factors that influence utilization of Antenatal care services

1.5 JUSTIFICATION

ANC is vital in early diagnosis and management of pregnancy related complications. Early intervention during first trimester can reduce significantly maternal mortality and improves foetal and maternal outcomes. It is also cost effective way of reducing maternal health related burden. Therefore, it is recommended that pregnant women should attend ANC clinics at least four times during the entire pregnancy period, and that the first such visit be in the first 12 weeks (first trimester) of the pregnancy. However, only 47 % of all pregnant mothers make four or more antenatal visits as recommended in FANC during pregnancy and 15%(KDHS 08-09) and 20% (KDHS 2014) make first visit in the first trimester in Kenya.

This study therefore will contribute ways of improving ANC utilization and will contribute towards attainment of MDG number 4 and 5(Currently SDG 3) and WHO targets.

Existing literature for the Kenya ANC Utilization seems to differ (Mwaniki *et al.*, 2002; KDHS 2008-09; KDHS 2014; Ouma *et al.*, 2010; Delva *et al.*, 2010), and it would be necessary to localize solutions by undertaking a study to ascertain issues relating to ANC utilization.

Residents who have stayed in Kosirai division for more than six months have been included in this study because they will fairly depict the nature of utilization of ANC services among local pregnant women of Kosirai division. Those who have stayed for less than six months could be confounding to the study.

1.6 SIGNIFICANCE OF THE STUDY

ANC services are important in reducing maternal morbidity, mortality and complications. It enables fast detection of potential life threatening complications and hence improves maternal health. Understanding the factors affecting utilizations of ANC services in the first trimester is important in designing policies that will be used to improve its uptake and also informs the implementation of such policies. The first trimester provides an earliest opportunity to monitor the health of the Mother hence early diagnosis and treatment. This is in line with millennium development goal number 5

CHAPTER TWO: LITERATURE REVIEW

2.1 Uptake of ANC services

Globally, the utilization of ANC services differs among developed and developing countries. Several studies have found the average gestational age at booking in developed countries to be as early as 13 weeks and the average number of ANC visits pitted at 6 (Al-Shamari *et al.*, 1994) and that only 30.05% of all women seek antenatal care (Hafez *et al.*, 1999). However other studies from England and Wales consistently show late ANC entry. It shows that significant proportions of ethnic minority women, single mothers and those with an earlier age at completing education access ANC services late (Rowe, 2008; Raleigh *et al.*, 2010). Primi parous women of high obstetric risk to have been found to be 34.3% more likely to initiate ANC after 18 weeks of gestation than a low risk reference group which association between high obstetric risk status and late initiation of ANC was not replicated among multi parous women (Kupek *et al.*, 2002). In

Nepal, 29% of pregnant women receive the recommended four antenatal visits (Simkhada *et al.*, 2010, Kambarani *et al* 1999) had previously shown that only a quarter of all women start ANC in the first trimester and up to two-thirds make less than five ANC visit in total. In Myanmar, recent data shows that up to 96% of married female youths receive ANC at least once and 79% make at least 4 ANC visits during pregnancy (Sein, 2011).

In Sub Saharan Africa, utilization of ANC services is low especially in hard to reach rural areas. In Nigeria, the mean gestational age at first antenatal visit differs from one study to another. According to Adegbala (2009), it is 19.1 +/- 7.8 weeks and differs with parity. While the nulliparous and primiparous women book earlier (mean 18.5 +/- 8.3 and 18.4 +/- 7.4 weeks respectively), those with higher parity book much later, mean 25.9 +/- 8.6 weeks. Only 27% book by end of first trimester, while the majority (55.2%) book in the second (14 to 26 weeks gestation). Furthermore, up to 8% of women have their first antenatal visit after the 34th gestational week. Akee and Audu (1998) had previously found the average gestational age at first antenatal attendance to be 23.5 +/- 6.0 weeks. They also found that there was no difference between the gestational age at first attendance for the literate subgroup across the age brackets and parity, but that the gestational age at booking among the grand multiparous women was significantly higher than that of the primigravidae. Another Nigerian study done in 2008 found that the average gestational age at booking for ANC to be 26.12 +/- 7.6 weeks and that parity significantly influenced the gestational age at first booking. Gestational age at first visit for primagravidae was found to be 24.0 +/-7.9 weeks while that for multigravidae was 27.16 +/- 7.5 weeks, with the grand multiparous women averagely coming at 26.12 +/- 7.6 weeks (Nwagha *et al.*, 2008). While another Nigerian study done in 2006 found the mean gestational age at booking to be 21.82 (+/-7.0) weeks and that only 14.1% of women booked before 14 weeks (Okunloha *et al.*, 2006).

In Tanzania, for instance, it has been found that only about half of all pregnant women first attend ANC during or before the fourth month of gestation (Anders *et al.*, 2008). In rural Uganda, 57.7% of all ANC women initially visit clinic during the 2nd trimester, and 33.5% during the 3rd trimester, and, only 37.1% make at least 4 ANC visits (Kiwuwa and Mufubenga, 2008). In Ethiopia, it has been found that up to 42.8% of the pregnant

women make their first ANC visit in the 3rd trimester and that only 6.5% of all women attain the recommended four visits. Further, women in the age group 15-24 are more likely to attend ANC than those in the age group 25-34 and students and farmers are about four times likely to attend ANC than housewives (Fekede, 2007).

In Kenya, three-quarters of the population lives in rural areas and face physical barriers that pose a challenge to health care delivery, including ANC. While it is recommended that the first antenatal visit occurs within the first three months of pregnancy, and subsequent visits continue on a monthly basis through to the 28th week of pregnancy and two weekly thereafter until term, this is rarely achieved. WHO recommends that a woman without complications should have at least four ANC visits, the first of which should take place during the first trimester. Yet, less than half (47%) of pregnant women in Kenya make four or more antenatal visits, a notable decline from 52% in the 2003 KDHS report. In the urban areas, 60% of pregnant women make four or more ANC visits compared with less than half of rural women (44%). Moreover, most women do not receive ANC early in the pregnancy, with only 15% KDHS 08-09 and 20% KDHS 2014 of women obtaining this care in the first trimester and only about half (52%) having received it by the sixth month of pregnancy. Overall, the median number of months of pregnancy at first visit is 5.7 (KDHS 2008) and 6.2 (KDHS 2014)

Other studies have however have improvements in some ANC services and access to the same over the years in Kenya (Ouma *et al*, 2010). However, this has not been replicated in all parts of the country (Delva *et al*, 2010. In a study done at the Coast province of Kenya, it was found that about half of women in rural and urban settings (52.2% and 49.2%, respectively) attend antenatal clinics only once. They identified lower parity, urban setting, older age and having received iron sulphate and folate supplements during the first ANC visit as independent predictors of more frequent visits. The study further found that the first ANC visit occurred after 28 weeks of pregnancy for 30% of women and that improved provision of basic essential obstetric care may increase attendance. In contrast to the coastal region, in the western region of Kenya, a study has found that up to 90% women visit ANC clinic at least once during pregnancy with median number of visits at 4. Most women (64%) however, have been noted to first visit ANC clinic in the

3rd trimester (van Eijk *et al.*, 2006). A study from Mbeere, in the eastern province has earlier found ANC utilization to reach 97.5% (Mwaniki *et al.*, 2002)

2.2 Morbidity and Mortality

Maternal mortality is the most extreme consequence of poor maternal health. Complications of pregnancy and childbirth are the leading cause of disability and death among women between the ages of 15-49 (WHO, 2010). Maternal mortality is either the death of a woman during pregnancy, delivery, or six weeks following the birth of the baby. Every year, it is estimated that 500,000 women die as a result of pregnancy and childbirth; one woman dies every minute. For every woman that dies, it is estimated that more than 25 others suffer a debilitating injury, often with life-long consequences. Furthermore, maternal death often results in death to the new-born and increases the risks of survival for the older children. It is estimated that 4 million newborns die in the first week of life every year, mostly due to problems during pregnancy and childbirth (WHO, 2010). According to World Health Organization (WHO), the world maternal mortality rate was 400 per 100, 000 live births. Approximately 800 women die globally from preventable causes related to pregnancy and child birth. Specifically, in 2010, 287,000 women died during pregnancy and child birth and 99% of these maternal deaths occurred in developing countries. The report further found that these deaths are higher in women living in rural areas and poorer communities (WHO, 2010).

Maternal mortality is among the health indicators that reflect the greatest disparity between rich and poor. The main causes of maternal mortality are severe bleeding, infection, unsafe abortion, Eclampsia, and obstructed labour. While every woman is at risk for experiencing sudden and unexpected complications during pregnancy, childbirth and following delivery, adequate antenatal, obstetric and post-natal care can reduce the risk of death considerably. The fact that more than 90% of maternal deaths and morbidities occur in developing countries, indicates that these resource-constrained settings lack adequate and available resources and health services. In developing

countries maternal mortalities is estimated as 290 deaths per 100,000 in 2008, while in sub Saharan Africa (SSA) it is estimated as 640 deaths per 100,000 live births (WHO, 2010).

However, the maternal mortality worldwide dropped by 50% between 1990 and 2008. This is summarized as shown in table 1.

Table 1.WHO, 2010 Global estimate of maternal mortality ratio/100,000 live birth

Region	Estimated Maternal Mortality Ratio/ 100,000			Percentage Change on MMR 1990-2008
	1990	2000	2008	
Africa	780	720	590	-25
SSA	870	790	640	-26
South Asia	610	430	290	-53
East Asia	200	130	88	-56
Developed countries	12	11	14	16
Developing countries	440	370	290	-34
Least developed countries	900	750	590	-35
World	400	340	260	-34

Source; WHO 2010

2.3 Importance of Early and Utilization

The International Safe Motherhood Initiative's aim of reducing maternal mortality globally aspires to enable all pregnant women have safe and healthy pregnancy and delivery through encouragement of early and regular use of ANC and PNC services. The main causes of maternal mortalities include severe bleeding, eclampsia, obstructed labour, unsafe abortion and infections leading to sepsis.

Early antenatal care attendance plays a major role in detecting and treating complications of pregnancy and forms a good basis for appropriate management during delivery and after childbirth (Semakelang H. *et al.*, 2007).

History and thorough general and obstetric examination informs the foundation of effective antenatal care. Early ANC attendance provides an opportunity to promote the maternal health messages regarding nutrition, rest, hygiene, sex and newborn care.

In the first trimester of pregnancy, ultrasound sonography is done to detect accurate dating, number of foetuses, gross foetal anomaly and any uterine or adnexal pathology.

The value of a number of screening tests and interventions at ANC service centres is firmly established. Examples include the prevention and treatment of malaria and anaemia, the early detection of hypertension and proteinuria, and the treatment of severe hypertension. (WHO 2010)

Early booking to antenatal services ensures that essential information about the woman's pregnancy and health relevant to her physical, psychological, social, cultural and educational state are established in order to detect, predict, prevent and manage problems with women and/or the unborn babies. Maternity services aim to deliver a comprehensive and multidisciplinary service that meets the needs of individual women and families and are commissioned within a context of managed care networks which include a range of provision for routine and specialist services for women and their families such as routine antenatal and post-natal care.(FANC 2007)

The most common route of access to antenatal care is through the midwife at a health facility who usually carries out assessment of pregnant women at any time during the first trimester (12 weeks) of pregnancy. There are three stages of pregnancy referred to as trimesters. They are the first trimester (conception to 12 weeks), second trimester (13 weeks to 28 weeks) and third trimester (29 weeks to 40 weeks). Late booking affects the

antenatal booking interview, the major first contact women have with the midwifery services, which usually occurs after confirmation of pregnancy (FANC 2007)

The FANC model recommends that the first antenatal visit occur within the first three months of pregnancy, and subsequent visits continue on a monthly basis through to the 28th week of pregnancy and two weekly thereafter until term. WHO also recommends that a woman without complications should have at least four ANC visits, the first of which should take place during the first trimester. In line with this, Kenya adopted this model of reduced number of antenatal visits, unless a woman has high risk pregnancy. This was with the aim of lowering ANC costs without having increased risk to mother or baby (Carroli *et al*; 2001; FANC, 2007).

The guideline recommends that women should have access to maternity services within the first 12 weeks of pregnancy to give mothers and healthcare professionals the opportunity to plan their antenatal care effectively and benefit from early screening. This is an important period for establishing a professional relationship with the woman, which will provide the basis of the woman's perception of the midwifery

2.4 Factors affecting ANC utilization in the first trimester of pregnancy

Data from Kenya indicates that 92% of women receive ANC services today (KDHS 08-09). It further shows that the mother's age at birth and the child's birth order are not strongly related to use of ANC, except that high-parity women are more likely than low-parity women to miss ANC altogether. Further, data shows that rural women are less likely than their urban counterparts to get ANC. There are marked regional variations in ANC coverage in the country, with over one-quarter of women in North Eastern province not getting any care at all. Variously, women with higher education are much more likely to receive ANC, such that proportion of women who do not get the service declines steadily as education increases. One-quarter of women with no education get no ANC at all. Further, the wealthier a woman is the more likely she is to get the care. Surveys indicate that up to 83% of all women who receive ANC obtain the same from government facilities (KDHS 2008-09).

Factors associated with failure to initiate ANC early are fairly related between different countries and regions the globe over. In England and Wales, they include maternal age at booking, gestation at first presentation, smoking status, ethnicity, type of hospital at booking, the planned pattern of ANC and the planned place of delivery. Others include perceived obstetric risk, with primiparous women of high obstetric risk more likely to initiate ANC later than a low risk reference group (Hafez et al., 1999; Petrou *et al.*, 2001; Kupek *et al.*, 2002) and also whether the woman has a partner, with those living without a husband/partner seeking care much later (Rowe, 2008; Sunil 2010). Additionally, a study from south Africa, while noting that most women in rural areas attend their first antenatal clinic late in pregnancy and fail to return for any follow-up care, notes that women who do not perceive significant health threats during pregnancy view more than one ANC visit as unnecessary (Myer and Harrison, 2003). Petrou et al have further shown that women booked into teaching as opposed to non-teaching facilities attend clinic fewer times. This is consistent with Al-Shamari *et al* (1994) earlier findings.

Additionally, Al-Shamari et al had suggested other factors such as the expectant mothers' awareness of the importance of antenatal visits, level of education of both husband and wife, lower parity and poor obstetric history all which enhance early gestational age at booking and have support from other (Simkhada *et al.*, 2008) studies. Al-Shamari et al also found that family income and gestational age at booking affected the number of antenatal visits paid. Studies from Kenya and elsewhere have also associated low level of education and a low socio-economic status (Erci, 2003; van Eijk *et al.*, 2006; Quelopana, 2009; Sunil, 2010; Sein, 2011) as well as the distance a woman has to cover to a health facility especially where it is above 5 km, with failure of or late ANC attendance (Mwaniki *et al.*, 2002). Others have identified a strong relationship between the perceived quality of care and utilisation and by-pass of ANC services (Audo *et al.*, 2005).

Nwagha *et al* (2008) found that in Nigeria, occupation did not have significant influence on gestational age at booking. A different study however indicated that increasing parity, increasing number of living children, gainful employment of client and Islamic religion increase the likelihood of positive perception and search of ANC (Oladapo and Osiberu, 2008; Quelopana, 2009). In the same country, Adegbala (2009) found that women in higher social class have been found to book for ANC earlier than those from other social

classes. Other studies further suggest that early booking determinants include the perceived benefits of such practice, recommendations from health care providers, and occurrence of complication(s) in previous pregnancy. Illness in the index pregnancy and nulliparity also significantly favour early booking (Okunloha *et al.*, 2006).

A study in Zimbabwe has observed that women, especially younger ones, prefer more than the stipulated five goal oriented visits, citing the importance of being assured that the foetus is growing well. They consider that visits spaced too widely make it difficult for service providers to help, should complications develop. On the other hand, women above 35 years old are not so concerned with the visits. The study further found that cultural beliefs greatly influence the time a pregnancy is acknowledged and reported and mothers feared to attend ANC early because it is believed that pregnant women and the pregnancy are vulnerable to witchcraft during the early period of pregnancy (Mathole *et al.*, 2004). This has support too from South Africa, where although pregnancy is traditionally viewed as an honour and needs efforts to preserve it, attendance of antenatal clinics is faced with fear of bewitchment causing delayed attendance. Women thus use herbs to preserve and protect their unborn infants from harm and prefer traditional birth attendants to the harsh treatment that they receive from midwives in health facilities (Ngomane and Mulaudzi, 2010), and this contributes to the when women first seek ANC services. Other studies emphasize the role of culture on use and failure to use ANC services (Simkhada *et al.*, 2008).

A different study in Zimbabwe found, in addition to socio-economic issues, individuals' perceptions about ANC, limited knowledge about ANC and structural barriers, that policy-related issues such as requiring national identity cards from pregnant adolescents (or from their spouses) prohibited some of them from utilising ANC services (Chaibva *et al.*, 2009).

Literature from Ethiopia suggests factors such as availability of a health facility within one's proximity and agrees with Al-Shamari *et al* (1994) and affordability of antenatal care fee. Others include time convenience as well as the perceived quality of service offered at the clinic (Fantahun and Olwit; 1995). Other studies from elsewhere further suggests that cultural issues, distance, infrastructure and socioeconomic status are

important determinants of maternal healthcare-seeking behaviour and affect ANC services utilization especially at the village level (Islam and Odland, 2011)

In Nepal, mothers-in-law play a negative role in the decisions around accessing health care facilities and providers, and do not to support/encourage ANC check-ups. They expect pregnant daughters-in-law keep fulfilling their household duties instead of have time to visit ANC clinic, with perceptions that ANC is not beneficial based largely on their own past experiences (Simkhada *et al.*, 2010). Other studies have also shown the influence of freedom of decision-making, perception about the need for ANC, and income on ANC visitation (Hafez *et al.*, 1999). Elsewhere, studies have found that equal proportions of women themselves and husbands are commonly the decision makers regarding starting ANC, and the delay could be associated with the wait for the decision maker to do so. Additionally, about a quarter of all women are not able to pay for ANC hence late first visits (Kambarami *et al.*, 1999). A study from Bangladesh variously found that perception of actual roles for ANC services and levels of knowledge on ANC issues were was low amongst husbands making them less supportive, so that women are likely to attend clinic late into the pregnancy and adhere less to the scheduled visits for lack of partner support (Rahman *et al.*, 2012).

Ethnic influence has also been identified to affect whether and how women seek ANC services. Studies from the Netherlands found that non-natives (non-Dutch) mothers were more likely to enter ANC later than Dutch mothers (Alderliesten, 2007; Chote *et al.*, 2011). Poor native language proficiency used in the clinic, lower maternal education and more teenage pregnancies were found to significantly contribute. Similar findings are published from England showing those ethnic minority women, single mothers, and those with an earlier age at completing education access ANC services late (Raleigh *et al.*, 2010). A study in Washington, DC found determinants of late ANC initiation among minority women to include maternal age outside 20-29 years, unemployment, no history of previous abortions, consideration of abortion, lack of money to pay for service, and no motivation to learn how to protect ones health as key contributors (Johnson *et al.*, 2003). Unwanted pregnancies and being too busy with other chores at home have also been identified as barriers and delaying factors to the use of ANC services in Turkey (Erci, 2003). Related views have been found in Australia, with pregnancy considered not a

special thing and childbearing felt a normal process, hence no need for special caution (Carolan and Cassar, 2010).

Review of literature from United States and elsewhere dating from 1990 to date has identified and classified ANC attendance barriers into those that are societal, maternal, and structural. Women may not be motivated to seek care, especially for unintended pregnancies. Societal and maternal reasons cited for poor motivation include a fear of medical procedures or disclosing the pregnancy to others, depression, and a belief that prenatal care is unnecessary. Structural barriers identified include long waiting times at facilities, the location and hours of the clinic, language and attitude of the clinic staff and provider, the cost of services, and a lack of child-friendly facilities (Phillipi, 2009). Other papers have most commonly identified factors affecting ANC services to include maternal education, husband's education, marital status, availability, cost, household income, women's employment, media exposure and having a history of obstetric complications (Simkhada *et al.*, 2008).

Institutional factors play a role in utilization of antenatal care services. Health care workers attitude, perception and compliance are important in attainment of FANC outcomes. Conrad *et al.* (2011) in a multicentre study conducted in Tanzania, Uganda and Burkina Faso found that health care workers did not comply with the procedures stipulated in FANC guidelines and negative impact on utilization of FANC.

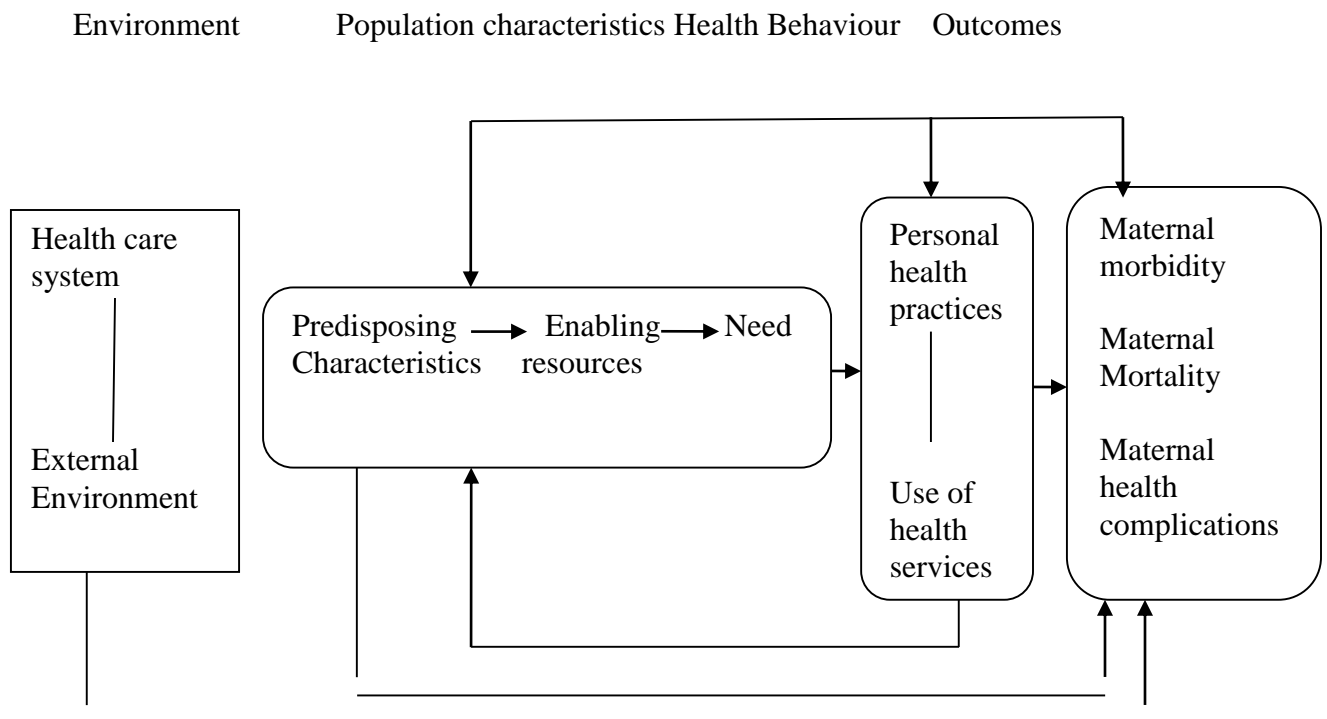
Mathole *et al.* (2004) also linked the poor attitude of health care providers towards pregnant women to low utilization of FANC services in Zimbabwe. This was also complicated by mothers' preference to unskilled birth attendants in the villages over the skilled birth attendants.

However, Yengo (2009) found that health workers, particularly the nurses' perception do not affects implementation and utilization of FANC in Tanzania. Her findings showed that health care workers perceive FANC as beneficial both to the pregnant mother and the unborn, but attributed shortage of human and material resources to poor implementation of FANC.

Banda study on barriers to utilization of focused antenatal care among pregnant women in Ntchisi district, Malawi found that health care workers complains of poor mechanisms of addressing obstacles and limitations facing the implementation of FANC (Banda, 2013). However, the recent neglect of quality of care in developing countries (Haddad & Fournier 1995) is now being addressed (Peabody *et al.*2006).

The quality of ANC services has been found in some literature to greatly influence its utilization and this relates to satisfaction of women with ANC services. Satisfaction is a major determinant of health service utilization in general (Aldana *et al.* 2001). Patient satisfaction as a component of quality of care has been given high priority in maternity care in developed countries (van Teijlingen *et al.* 2003). Lack of satisfaction with quality of care could be a major demotivating factor in the use of ANC services. In Kenya, the main complaints about the services offered included shortage of drugs and essential supplies, lack of commitment by staff, poor quality of food and lack of cleanliness (Mwaniki *et al.* 2002).

2.5 Modified Andersen and Newman’s utilization of health services model (1995)



This study adopted Andersen and Newman's utilization of health services model. It postulates that the utilization of health services is influenced by various factors such as the environment, population characteristics, and health behaviour.

The predisposing factors include the social –cultural characteristics, demographics and health beliefs that influence utilization of health services. Enabling factors are the logical aspects of obtaining health care; these include personal/family i.e. means of accessing care, source of income, availability of health personnel and facilities. Need factors are the immediate cause of health service use in this case pregnancy. These factors also depend on predisposing characteristics, enabling resources and healthcare gaps. The interaction of these main and other factors determines maternal health outcomes.

CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was based in households within Kosirai Division of Nandi County, Rift Valley, Kenya. It has an estimated population of 60,000 and is mainly inhabited by the Nandi sub-tribe of the Kalenjin community. It has a total of 8 locations. It has one health centre which conducts deliveries and the rest are dispensaries. Most facilities are manned by clinical officers and nurses. These facilities do not handle complicated maternal cases and lack emergency maternity wings. The health centre conducts on average forty deliveries per month.

The AMPATH primary health care program is operational in Kosirai division and has community health workers who identify pregnant women and link them to health care facilities (R. Vreeman, *et al.*, 2013). The infrastructural development of this area is not good with poor road networks, inadequate electricity supply and poor state of health facilities. The local community engage mostly in small scale agricultural activities and dairy farming.

3.2 Study population

The study population was pregnant women within Kosirai division, regardless of the gestational age. The target population will be all pregnant women that met the study inclusion criteria.

3.3 Study design

This was a cross-sectional descriptive study involving use of both quantitative and qualitative research methods.

3.4 Sample size

Using Fischer's formula approach, the sample size for this study would be:

$$n = z^2 pq / d^2$$

Where; $Z = 1.96$ - value, the desired confidence level at 95%.

$P=0.15$, the prevalence of mothers attending ANC in the first trimester clinics in Kenya
 division $q= 1-p = 0.85$

n =the desired sample size

$d=0.05$ is the margin of error at 95% confidence interval.

$$= \frac{(1.96 \times 1.96 \times 0.15 \times 0.85)}{(0.05 \times 0.05)}$$

$$=196$$

$$=196$$

$n= 196$ pregnant women

The sample size comprised 196 antenatal mothers and was proportionately allocated to the following locations as shown in table 2.

Table 2: Proportionate allocation of sample size per population size

Location	Approximate Population size	Approximate population of women	Estimated Population of pregnant women (1.083% of total population, DMOH, 2013)	Proportion of sampled women	Sampled pregnant women
Biribiriet	5,153	2577	55	0.09	18
Lelmokwo	12,300	6150	133	0.22	44
Mutwot	10,021	5011	108	0.18	35
Itigo	4,537	2269	83	0.14	27
Ngechek	7,425	3713	49	0.08	16
Kokwet	9,900	4950	107	0.18	35
Kosirai	5800	2900	62	0.10	21
Total	55,136	27,570	597	1	196

(Source: MPHS, Nandi North district Records, 2013)

3.5 Sampling technique

Stratified sampling was used in this study. This was stratified by locations within Kosirai division. In each stratum, systematic random sampling techniques were used to identify potential study participant until the desired sample size (196) was reached. Systematic sampling was chosen because the sampling frame is known (597) and every 3rd household with pregnant woman (597/196) was sampled. An identified participant was approached and the nature and purpose of the study explained adequately before informed consent was sought. If she declined consent, the next household with pregnant woman was sampled and subsequent 3rd household with pregnant woman was sampled.

3.6 Eligibility criteria

3.6.1 Inclusion criterion

1. Must be 18 to 49 years of age
2. Pregnant mothers who are 12 weeks pregnant and above.
3. Must have been a resident of Kosirai division for more than 6 months

3.6.2 Exclusion Criteria

1. Women who were too sick or weak to participate e.g. women with psychosis or those with very sick children

3.6.3 Limitation of the Study

This was a cross sectional descriptive study and the significant factors associated with utilization of ANC services were not be attributed as causation.

3.7 Data management and analysis

3.7.1 Data collection

Quantitative data was collected using a semi structured interviewer-administered questionnaire. The community health worker identified the pregnant woman and the selected pregnant woman participant was approached by research assistant or principal investigator and informed about the nature and purpose of the study. The research

assistant then interviewed her as she/he filled the semi-structured questionnaire. Data collected included socioeconomic, institutional, cultural issues and maternal health history.

Qualitative data involved focus group discussion among pregnant women and other relevant stakeholders (husbands, community representative, and health facility representative). Qualitative data collected included women's health seeking behaviour, institutional issues and cultural issues affecting utilization of ANC services in Kosirai division. Key informant interviews was carried out with 4 purposively selected informants; Division's area chief, Hospital matron, DMOH and mid wife nurses. The discussion will cover institutional capacity for ANC, Health seeking behaviour of local women and other issues of ANC. This will be recorded into a semi structured open questionnaire where it will later be categorised into thematic areas. This will be carried out by the principal investigator with assistance of the research assistant especially in recording of the responses.

3.7.2 Data Analysis

Quantitative data was coded and entered into access database and exported to STATA version 12 for analysis. It was cleaned before analysis using STATA statistical software. The descriptive statistics included measures for central tendencies such as mean, mode and median and presented in terms of figures and tables such as pie charts, bar graphs and Box-plots. Inferential statistics will be done using chi- square and this include multi-variate regression by analysis to establish association of socioeconomic and institutional factors with level of utilization of ANC services. The regression analysis will be run using Stata version 12 statistical software and it involves standardising independent and dependent variables.

The qualitative data was collected by recording in a digital recorder. The recorded information was transcribed then translated and back-translated to ensure the content meaning was maintained. Content analysis was done by assorting it by themes and it involved identification, coding, and categorizing the primary patterns of qualitative data. These patterns were consolidated into the emerging key themes.

3.8. Dissemination of findings

Relevant stakeholders and authorities may use the results from this study for developing ANC policy. Research papers for publication in peer-reviewed journals will disseminate data arising from this study. Health facilities authorities and opinion leaders will be given the study findings to guide the implementation of the ANC policy in Kosirai. Findings will also be presented in various relevant local and international conferences

3.9. Ethical considerations

IREC approval was sought before the research was carried out. Research permission was obtained from area District Medical Officer of Health and local administrative authorities of Kosirai division. The nature and Purpose of this study, risks and benefits was explained to the participants before informed consent was obtained. Participants were informed that they could withdraw at any point during the study if need be. They were also assured that all the information they give will be kept in confidence and that their names will not be required or identified at any point throughout the study. Data management was confidential and data integrity maintained by pass-wording the data base, locking filled questionnaires in data cabinets and drawers.

CHAPTER FOUR: RESULTS

Data analysis was performed using STATA version 12 special edition. Categorical variables were summarized as frequencies and corresponding percentages while continuous variables that followed the Gaussian distribution were summarized as the mean and standard deviation (sd). The continuous variables that were skewed were summarized as median and the corresponding inter quartile range. The normality test was conducted using Shapiro-Wilks test for normality. The test for association between categorical variables was conducted using Pearson's Chi Square test.

4.1 Socio-demographic characteristics of the respondents

There were 196 respondents of reproductive age (18-49 years) who were included in the study and whose data was eventually analysed. Of this were 62(32%) and 98(50%) aged 18-24 years and 25-34 years respectively. The rest were aged 35-49 years.

The respondents have varied marital status and most (59%) were married with only 1% who was separated. The details are as shown in figure 1.

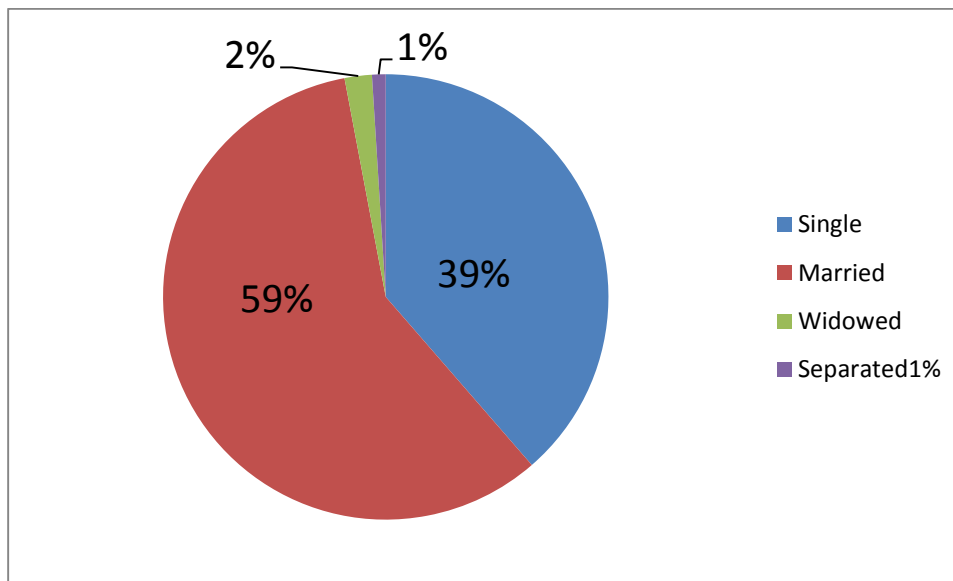


Figure 1: Marital status

There were 28(14.4%) respondents who were employed, 88(45.4%) who were self-employed and 78(40.2%) were unemployed.

In terms of the highest level of education attained by the respondents at the time of the study, two thirds of the respondents had attained at least a secondary level of education with those who had a college or University education accounting for 19.2%. This is shown in figure 2.

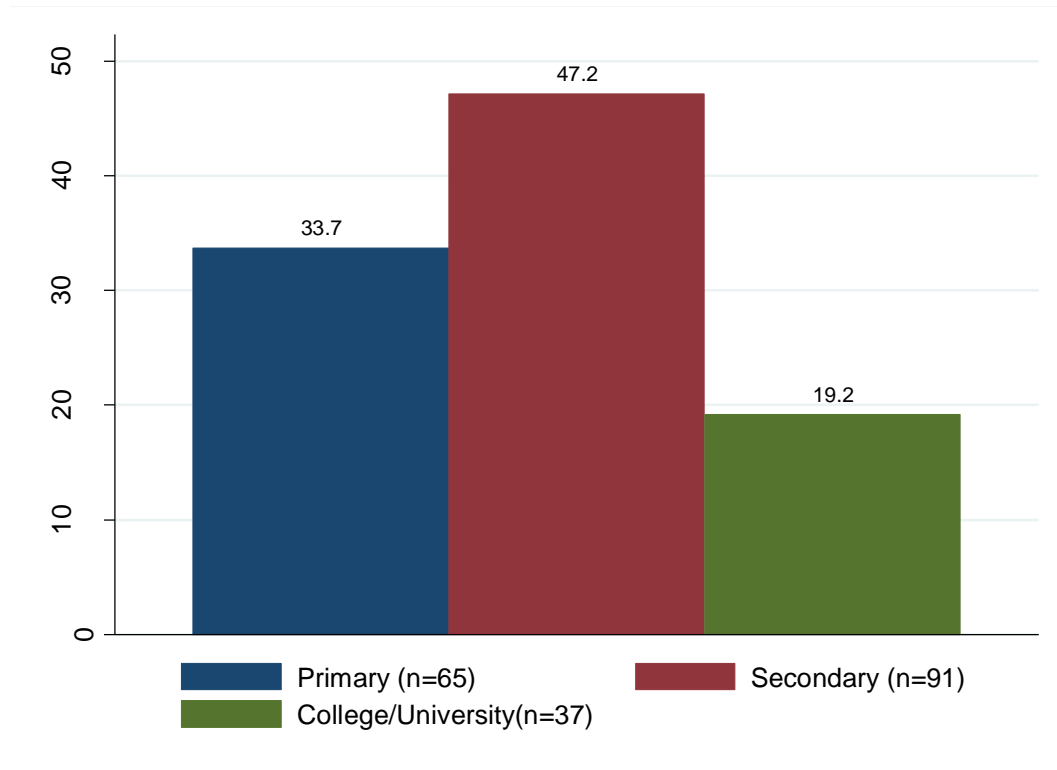


Figure 2: Level of education

Education and the occupation was established to be associated with majority of those having a college or University being employed, majority of those with secondary education being self employed and majority of those with primary education being unemployed. This is shown in table 3.

Table 3: Association between education and occupation

Education	Occupation			
	Employed	Self employed	Unemployed	Total
Primary	4(15%)	29(33%)	31(40%)	64(34%)
Secondary	4(15%)	55(63%)	31(40%)	90(47%)
College/University	19(70%)	3(3%)	15(19%)	37(19%)
Total	27(100%)	87(100%)	77(100%)	191(100%)

Chi Square value=63.04, df=4, P<0.0001

The association between occupation and education was statistically significant at 5% level of significance with Chi Square=63.04 (P<0.0001).

140 (73%) respondents earned their income from self-employment. 10% of the respondents earned their income from a formal employment while the remaining earned their income from other sources. Among those earning income via self employment, 65% (90) were married. Similarly, among those who were earning their income from a formal employment 85% (17) were married. Among those earning their income via other sources were 19% (6) were married. Those who were married were asked about the sources of income for their spouses and their responses were compared as shown in Figure 3.

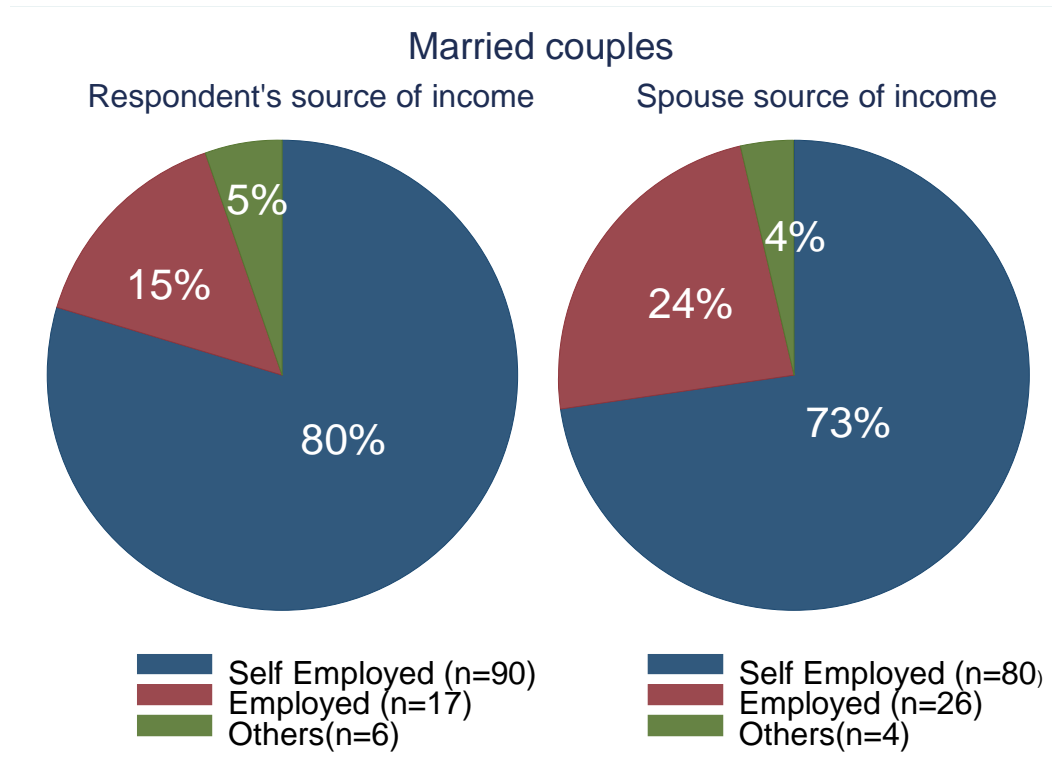


Figure 3: Sources of income among the married couples.

Majority of the respondents were Christians, 191(99%). There was one Muslim and one participant from unspecified religion.

Three quarters of the respondents, 140(74%), resided in personal houses while the rest live in rental houses. Of those who lived in a rental, the average rent paid was 746(sd: 379) shillings. The type of house structure for 62(33%) respondents was permanent. However, 125(67%) lived in a semi-permanent house structure. Of the 190 respondents who responded, 114(60%) owned land in which they live in.

Respondents had one or two sources of water. Table 4 illustrates the distribution of the respondents with respect to the two sources of water. Wells and bore holes were the primary sources of water to the respondents. There were 182(94.3%) respondents with only one source of water. The rest had two sources of water. There were three respondents who did not respond to this question.

Table 4: Source of water

	Second source of water				
First Source of water	River	Well	Bore hole	No second source	Total
Piped water	0	2(1%)	0	2(1%)	4(2%)
River	0	1(0.5%)	0	8(4.2%)	9(4.7%)
Well	3(1.6%)	0	0	111(57.5%)	114(59.1%)
Bore hole	4(2%)	0	1(0.5%)	61(31.6%)	66(34.2%)
Total	7(3.6%)	3(1.6%)	1(0.5%)	182(94.3%)	193(100%)

Property ownership was assessed and it was established that slightly above three quarters owned only one property most of whom are the owners of a cell phone, 134(72.8%) (Table 5). The median farm size among the 113 who have was 3(IQR: 1-4) acres.

Table 5: Ownership of property

	Second property owned					
First property	Motor bicycle	Bicycle	Fridge	Phone	No other property	Total
Motor vehicle	1(0.5%)	0	7(3.8%)	0	3(1.6%)	11(6.0%)
Motor bicycle	0	1(0.5%)	2(1.1%)	11(6.0%)	3(1.6%)	17(9.2%)
Bicycle	0	0	2(1.1%)	15(8.2%)	3(1.6%)	20(10.9%)
Fridge	0	0	0	0	1(0.5%)	1(0.5%)
Phone	1(0.5%)	0	0	0	134(72.8%)	135(73.4%)
Total	2(1.1%)	1(0.5%)	11(6.0%)	26(14.1%)	144(78.3%)	184(100%)

There was hardly anyone who was smoking or drinking alcohol (Table 6). Half of the respondents have been pregnant before. Two of them do not any child. The median number of children among those who have is 3(IQR: 2-4). Overall the median number of children is 1 (IQR: 0-3). Distance travelled to the health facility for ANC services was assessed with most of the respondents travelling between 2-5 kilometers to the health facility.

Table 6: Drug abuse

Variable	Sample size	Levels	n(%)
Smoking	195	Yes vs. No	1(0.5%)
Alcohol use	191	Yes vs. No	4(2%)
Parity	196	multigravida vs. Primigravida	98(50%)

The mode of transport for most of the respondents was footing, 90(47%). Slightly more than one third used motor bicycle or bicycle (Table 7). The rest used more than one means. There were three respondents who did not provide their means of transport.

Table 7: Mode of transport

First option for transport	Second means of transport				Total
	Public	Motor bicycle	Foot	No second means	
Private	4(2.1%)	0	1(0.5%)	2(1.0%)	7(3.6%)
Public	0	6(3.1%)	0	13(6.7%)	19(9.8%)
Motor bicycle/bicycle	1(0.5%)	0	6(3.1%)	70(36.3%)	77(39.9%)
Foot	0	0	0	90(46.6%)	90(46.6%)
Total	5(2.6%)	6(3.1%)	7(3.6%)	175(90.7%)	193(100%)

The entire 194 respondents who responded were aware about a facility offering ANC or PNC facilities. Majority of them, 112(59%) mentioned Mosoriot. Of this number, three mentioned Mosoriot and MTRH or Itigo as one other health facility (Figure 4).

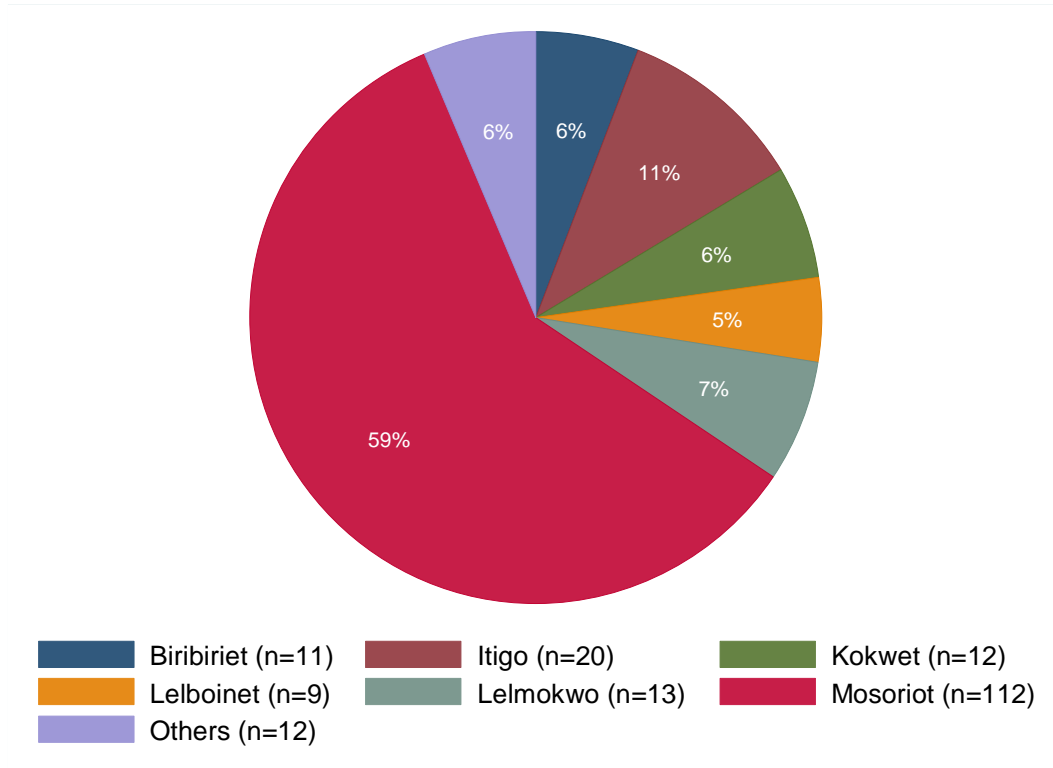


Figure 4: List of facilities offering ANC & PNC services

There were 18(10%) respondents who reported that they have ever attended a health facility for ANC services but failed to be attended to. Among the reasons given was lack of supplies, lack of staff, long waiting time, and bad attitude from the staff (Figure 5).

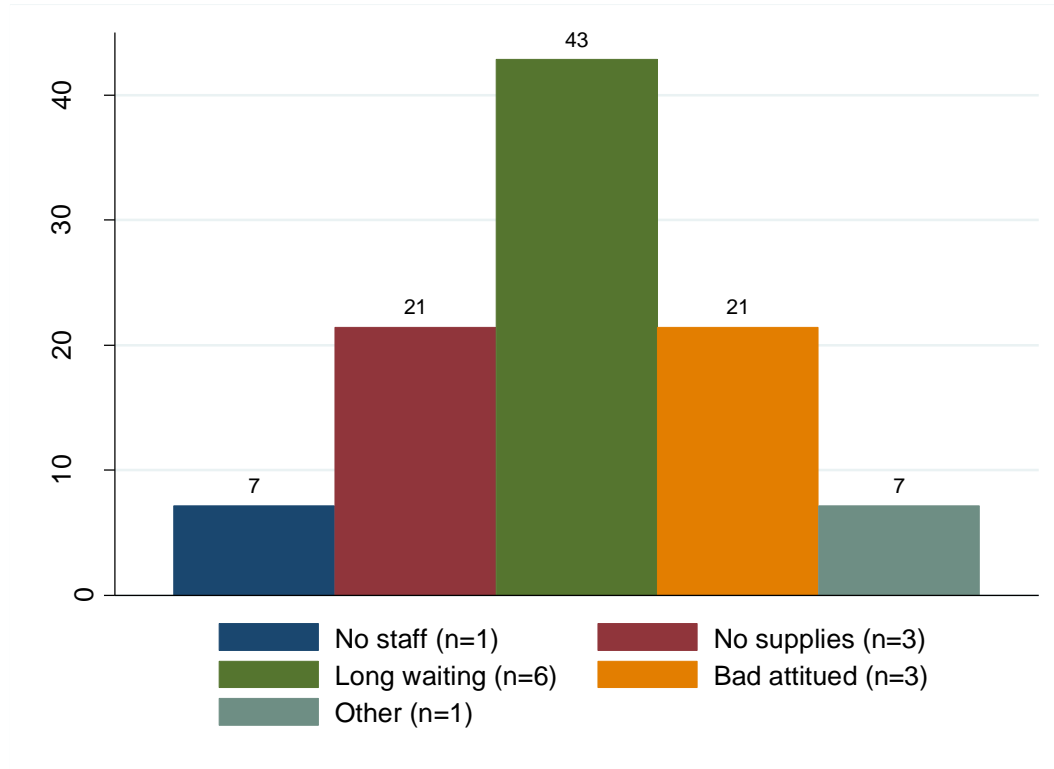


Figure 5: Reasons for failing to be attended

Of the 18 who failed to be attended to 16(89%) responded to whether they ever sought ANC services thereafter and of this number, 14(88%) did so. They were attended by clinical officer 4(27%), and a nurse 11(73%).

Most of the respondents were in their last trimester at the date of the interview. However the 96 (52%) respondents started ANC during the first trimester. The median gestation age at which they started ANC was 23 (± 8.2). There were 88(47.8%) who had not attended clinic for ANC at all during the first trimester. Of the 133 who had a pregnancy before, 121(91%) attended clinic for ANC. The gestational age at first ANC for most these respondents was 17-32 weeks.

Table 8: ANC attendance

Variable	Sample size	Levels	n(%) or mean (sd) median (IQR)
Current gestational age	196	Weeks	29(8.0)
Gestational age at start of ANC	196	weeks	23(8.2)
Frequency of ANC visits at first trimester	194	None	88(49%)
		Once	88(45%)
		Twice	6(3.3%)
		Thrice	2(1.0%)
Frequency of ANC visits if at term	42	None	5(12%)
		Once	2(5%)
		Twice	1(2%)
		Thrice	11(26%)
		Four times	21(50%)
		More than 4 times	2(5%)
Attended ANC during the previous pregnancy	133	Yes	121(91%)
		No	10(8%)
		Don't know	2(1%)
Gestational age at first ANC visit during the previous pregnancy	116	0-12 weeks	22(19%)
		12-32 weeks	81(70%)
		33-40 weeks	13(11%)
ANC fee	187	Shillings	20(0-50)
Affordable	187	Yes	180(96%)
		No	3(1.6%)
		Don't know	4(2.1%)
Insurance	191	Yes vs. No	42(22%)
Type of insurance	40	NHIF	35(86%)
		Community based	2(5%)

		NHIF and private	5(7.5%)
Husband influence on utilization of ANC	126	Yes vs. No	82(65%)
TBA	177	Yes	72(41%)
		No	86(49%)
		No comment	19(11%)

The reasons given by those who did not attend clinic for ANC during the previous pregnancy were general fear, fear of being reprimanded for being too young, fear to test positive for HIV, and thought that once could do ANC by herself. Each of these response had one responded. One other did not give a reason.

Most of the respondents were attending public health facilities 180(94%). The reason for doing so was possible affordable charge rates and reliable availability of health care workers.

The median ANC fee was 20(IQR: 0-50) and many thought that this was affordable to them. One fifth of the responded have an insurance cover. Most of them are covered by NHIF while others are covered by community based insurance cover or a combination of NHIF and private insurance cover.

Close to two thirds of those who responded to whether their husbands influence their utilization of ANC services acknowledged that their husbands do influence them. Two fifths of those who responded to whether they seek the services of a traditional birth attendant acknowledged that they do so.

4.2 Factors associated with ANC utilization during the first trimester

The test for association revealed that the source of income was significantly associated with ANC attendance during the first trimester (Table 9). The participants whose source of income is formal employment have 3 times, 3.08(1.07, 8.89), increased chance of attending ANC during the first trimester compared to those who are self-employed or have other sources of income, Table 10.

The other factor associated with ANC attendance during the first trimester was the current gestational age, $P < 0.0001$ (Table 9). Assessing the effect of this variable in a logistic regression model (Table 10) revealed that older gestational age was associated with 17% reduced chance of attending ANC during the first trimester, OR: 0.83(95% CI: 0.77, 0.89).

The “charges in the clinic” was assessed in a logistic regression model and it revealed that those who reported higher charges were more likely to attend ANC during the first trimester. There is a 20% increased chance of attending ANC during the first trimester among those who reported higher charges, OR: 1.20(95% CI: 1.02, 1.41).

The rest of the associations were as presented in Tables 9 and 10

Table 9: Socioeconomic and cultural factors associated with ANC attendance during the first trimester

Variable	n	Levels	ANC attendance at first trimester		Total	P
			No	Yes		
Age (years)	196	>34 vs. <34	30(18%)	6(21%)	36(18%)	0.651
Married	194	Yes vs. No	94(57%)	20(71%)	114(59%)	0.141
Religion	193	Christians vs. Muslims/others	163(98%)	28(100%)	191(99%)	1.000 ^f
Occupation	194	Employed vs. self employed/unemployed	145(87%)	21(78%)	166(86%)	0.238 ^f
Education	193	College/University vs. Secondary/primary	136(82%)	20(71%)	156(81%)	0.172
Source of income	192	Formal employment vs. Self employment/others	14(8%)	6(22%)	20(10%)	0.042 ^f
Source of water	193	Well vs. Piped water, river, borehole	101(61%)	13(46%)	114(59%)	0.141
Have Electricity	191	Yes vs. No	31(19%)	7(26%)	38(20%)	0.397
Property	184	Motor vehicle	7(4%)	4(15%)	11(6%)	0.322 ^f
		Motor bike	15(9%)	2(8%)	17(9%)	
		Bicycle	18(11%)	2(8%)	20(11%)	
		Fridge	1(1%)	0	1(1%)	
		Phone	117(74%)	18(69%)	135(73%)	
Smoking	195	Yes vs. No	1(1%)	0	1(1%)	1.000 ^f

Alcohol use	191	Yes vs. No	4(2%)	0	4(2%)	1.000 ^f
Parity	196	Primigravida vs. Multigravida	85(51%)	13(46%)	98(50%)	0.683
Distance	192	>5 km vs. ≤5 km	16(10%)	3(11%)	19(10%)	0.735 ^f
Footing	193	Footing vs. Private, public, motor bike, bicycle	144(87%)	23(82%)	167(87%)	0.547 ^f
Name of the facility where one could get ANC services	189	Mosoriot vs. others	95(59%)	17(63%)	112(59%)	0.672
No services despite ANC attendance	187	Yes vs. No	13(8%)	5(18%)	18(10%)	0.155 ^f
Gestational age at ANC visit during previous pregnancy	116	0-12 weeks	16(16%)	6(32%)	22(19%)	0.347 ^f
		12-32 weeks	70(72%)	11(59%)	81(70%)	
		33-40 weeks	11(11%)	2(11%)	13(11%)	
Nature of facility	191	Public vs. private	154(94%)	26(93%)	180(94%)	0.666 ^f
Affordable	187	Yes vs. No	155(97%)	25(93%)	180(96%)	0.267 ^f
Have insurance cover	191	Yes vs. No	34(21%)	8(30%)	42(22%)	0.301
Husband influences ANC attendance	126	Yes vs. No	67(63%)	15(75%)	82(65%)	0.310
TBA	177	Yes vs. No	63(41%)	9(36%)	72(41%)	0.607
Continuous variables						
Number of children	194		1(0-3)	2(0-3)	1(0-3)	0.785

Farm size	113		3(1-4)	3(1-4)	3(1-4)	0.997
Current gestational age	196		30(7)	20(8)	29(8)	<.000 1
Charges (Kshs.)	187		20(0-50)	20(0-200)	20(0-50)	0.090

^f – Fisher’s exact p value was reported due to the problem of having some cells with expected cell count less than 5.

There is a trend towards increased chance of attending ANC during the first trimester among those have larger acreage of farm, and larger number of children, OR: 1.09(95% CI: 0.89, 1.33), and OR: 1.02(95% CI: 0.78, 1.32) respectively.

There a trend toward reduced chance of attending ANC during the first trimester among those who were visiting a tradition birth attendant compared to those who were not (Table 10). Similarly, those participants whose husband influences their visit to ANC, those who thought that the charges were affordable, those who had insurance policy, those who visit public facility, those whose gestational was more than 17 weeks during the previous ANC attendance, those who did not get services in clinic after attending, those who were footing to the clinic, those who had electricity in their homes, those who were using water from the well, and those with college or university education had a tendency toward reduced chance of attending ANC during the first trimester (Table 10).

Participants older than 34 years, married participants, participants whose family own a motor vehicle/motor bicycle/bicycle, participants who were primagravida, those who travelled a distance of >5 Km, and those who were visiting Mosoriot health facility had a tendency of increased chance of ANC attendance during the first trimester (Table 10).

Table 10: Estimation of the effect factors on ANC attendance during the first trimester

Variable	n	Levels	OR(95% CI)
Age (years)	196	>34 vs. <34	1.25(0.47, 3.36)
Married	194	Yes vs. No	1.91(0.80, 4.60)

Religion	193	Christians vs. Muslims/others	-
Occupation	194	Employed vs. self employed/unemployed	0.53(0.19, 1.46)
Education	193	College/University vs. Secondary/primary	0.53(0.21, 1.32)
Source of income	192	Formal employment vs. Self employment/others	3.08(1.07, 8.89)
Source of water	193	Well vs. Piped water, river, borehole	0.55(0.25, 1.23)
Have Electricity	191	Yes vs. No	0.67(0.26, 1.71)
Property	184	Motor vehicle/Motor bike/Bicycle vs. Fridge/Phone	1.31(0.53, 3.25)
Smoking	195	Yes vs. No	-
Alcohol use	191	Yes vs. No	-
Parity	196	Primagravida vs. Multigravida	1.18(0.53, 2.63)
Distance	192	>5 km vs. <=5 km	1.16(0.32, 4.30)
Footing	193	Footing vs. Private, public, motor bike, bicycle	0.67(0.23, 1.96)
Name of the facility where one could get ANC services	189	Mosoriot vs. others	1.20(0.52, 2.78)
No services despite ANC attendance	187	Yes vs. No	0.41(0.13, 1.25)
Gestational age at ANC visit during previous pregnancy	116	0-12 weeks	Reference group
		12-32 weeks vs. 0-12 weeks	0.42(0.13, 1.30)
		33-40 weeks vs. 0-12 weeks	0.48(0.08, 2.86)
Nature of facility	191	Public vs. private	0.76(0.16, 3.72)

Affordable	187	Yes vs. No	0.40(0.07, 2.19)
Have insurance cover	191	Yes vs. No	0.62(0.25, 1.54)
Husband influences ANC attendance	126	Yes vs. No	0.57(0.19, 1.70)
TBA	177	Yes vs. No	0.79(0.33, 1.91)
Number of children (n=194)			1.02(0.78, 1.32)
Farm size (n=113)			1.09(0.89, 1.33)
Current gestational age (n=196)			0.83(0.77, 0.89)
Charges per Kshs. 100 increase (n=187)			1.20(1.02, 1.41)

4.4 Qualitative results

Key informant and focus group discussion were also used to collect qualitative data to fill the gaps of quantitative data. Focus group discussions were based on four main thematic areas: uptake of ANC services by women; factors affecting uptake/utilization; provision of ANC services among health facilities in Kosirai division; and role of community leadership in promoting Government ANC policies.

a) Poor utilization of ANC services

Focus group discussion revealed that the utilization of ANC services in the first trimester in Kosirai division was very poor. Most of the pregnant women participants admitted that they first sought ANC services during the second and third trimester. In fact they did not see need of attending ANC clinic in the first trimester as shown by the following clip records;

‘I first attended ANC clinic when i was 28 weeks pregnant. How do you expect me to go to the clinic when i have no medical condition.....i am medically fit and i don’t feel nausea or vomiting, drowsy and my stomach is fine’

(FGDP2)

'I only attended ANC clinic at three months so as to have my blood levels checked because in the previous pregnancy i had problems with my blood levels. Otherwise if i was okay could have waited until almost term'

(FGDP1)

b) Health seeking behaviour

Poor health seeking behaviour among pregnant women in Kosiraiwas cited by the majority of the FGD participants to negatively affect utilization of ANC services. The fear of being tested for HIV was mostly emphasized. Most women preferred to visit ANC at second trimester so as to minimize the number of ANC visits. These are some of their verbatim phrases;

"If i go to ANC clinic early, definitely they will tell me my HIV status and i don't want to know at this stage.....this evil disease is bad"

(FGDP4)

'If one starts clinic in the first trimester, the number of visits to the hospital will be many, therefore I prefer starting in the second or third trimester so as to reduce the number of trips to the hospital.'

(FGDP2)

"If I don't feel sick in the early stages of pregnancy, i know everything is okay, so i don't go the clinic until the baby has grown bigger may be at six or seven months is when i can start"

(FGDP4)

The health care representative participant also cited that many women come late to ANC clinic as captured in this clip record;

“Most pregnant women would only attend ANC in the first pregnancy if the client has complications or had a miscarriage in the previous pregnancy.....”

(FGDP5)

C) Traditional Birth Attendance

The role of traditional birth attendants in utilization of ANC services was shown to be important. The participants insisted that seeking the TBAs services does not interfere in any way with the ANC attendance.

“I must see a traditional birth attendant whenever am pregnant. I trust her and she does so much.....she always ask if you have attended ANC and always encourages one to seek ANC.....TBA identifies baby’s cord tied around the neck and other complication....clinicians may miss this...”

(FGDP7)

d) Husband influence

Some women also cited that the decision on when to attend ANC is not influenced by their husband since they make a personal choice on when to attend.

“Our husbands does not hinder or limit us from seeking ANC health services.....they leave it to us to decide.....sometimes they are happy when we go to the clinic”

(FGDP6)

“My husband is happy with whatever decision i make as far as ANC services is concerned...whenever i visit TBA, he is happy, if i choose clinic, he is ok with that...”

(FGDP1)

e) Health Care Financing

Health care financing for the facilities in Kosirai Division was expressed to be inadequate since finances are controlled at the county level therefore the facilities face erratic supply of medical supplies.

“Health care financing for the facilities are controlled at the county Governments which still has transition challenges. This affects provision of basic medical services which include staffing and staff motivation, medical equipment and quality of health services”

(FGDP5)

f) Medical supplies

Poor medical supplies affect utilization of ANC services. One of the participants questioned the feasibility/practicability of providing quality ANC services in a facility where even basic laboratory reagents are not available. Mosoriot health centre was also noted to be the only facility which offers lab services and more often it runs short of reagents necessary for 1st visit ANC profile.

*“ The hospital often lack basic laboratory reagents for testing ANC profile.....
how can acceptable quality services be provided?..... Simply, women are sent
back home to wait until reagents are supplied by KEMSA”*

(FGDP5)

g) ANC policy awareness

Most of the respondents were not aware of the government policies on ANC utilization; the FANC recommendation on minimum number of visits to ANC clinic and the timing on its use. The respondents only cited free provision of mosquito nets and free maternity services to be the only policies they know.

‘I am only aware of free mosquito nets that the government has given to us, otherwise I have never heard of any policies in the hospital’

(FGD 8)

“I have never heard that we are required to attend at least four ANC visits during the term of pregnancy...our chief has never told us this....infact our chiefs only talk of ANC whenever there is a crisis.....”

(FGDP2)

h) Role of community leaders in promoting ANC services in the first trimester

Most community leaders are not advocating on issues related to uptake of ANC services. Majority of the FGD participants expressed that most of their leaders would only advocate on issues of HIV prevention and not ANC services. One of the respondent said that the only time a leader would mention of ANC services is when a woman in the community dies of child birth related complications.

“The community leaders will only emphasize on importance of ANC clinic if a woman in the community dies of a pregnancy related complications.....”

(FGDP1)

“Our leaders only tell us about HIV and this is mostly shared among males in community barazas.....their partners/spouses may not be aware of this since they are not involved”

(FGDP4)

Most of the participants dismissed the idea that health care workers attitude, distance to health facilities, waiting time, failure to be attended to by clinician and other institutional factors hinder them from seeking ANC services.

The key informant interviews also demonstrated low uptake of ANC services during the first trimester. This was backed by information given by the district medical officer of health that majority of pregnant women start ANC in the second trimester of pregnancy and that most mothers don't make the recommended four ANC visits as stated by FANC.

The main challenges that face utilization of ANC services during the first trimester were reported by the DMOH as late diagnosis of pregnancy as well as no complains experienced by the women in the first trimester. He cited that most rural health facilities in Kosirai Division are not well equipped to provide ANC services and therefore have limitation in laboratory tests such as ANC profile. Mosoriot Health Centre is the only facility that offers laboratory services and has a functional maternity yet it lacks essential laboratory reagents for ANC profiles.

Other factors reported include cultural factors whereby mothers delivering at home are viewed as stronger than women delivering at home.

Physical accessibility to the health facilities is good and distance between facilities is less than 5km. Institutional factors were reported to affect utilization of ANC. Poor staff attitude and high work load were reported to affect negatively ANC utilization.

Role of community leaders was also reported to be limited to mobilization and sensitization on general health concerns and not ANC services.

CHAPTER FIVE: DISCUSSION

5.1. Level of utilization of ANC services

The utilization of ANC services in Kosirai Division during the first trimester is at 52% (96/194) compared to FANC/WHO targets of 100% but higher than those reported by the Kenya demographic health survey, 2010 (15%). This means that half of expectant women in Kosirai Division do not seek ANC services at any facility during the first 12 weeks of pregnancy. The results also showed that among those who attended ANC during the first trimester, 92% (88/96) attended ANC only once, 6.25% attended it twice, and paltry 2.1% attended ANC more than two times. Furthermore, among 42 expectant women at term pregnancy, 12% had not sought any ANC services while 5% had it once and 2% , 26% and 50% had sought for ANC services twice, thrice and four times, respectively. Only 5% had attended ANC more than 4 times among 42 women at term. The poor utilization of ANC services during the first trimester contributes to poor compliance with the minimum four visits required for every expectant woman at term. This therefore might contribute to increased Feto-maternal complications and mortalities in Kenya.

These results are consistent with KDHS2008-09 findings which found that Pregnant women still make their first ANC visit way after the recommended 12th week of the pregnancy, averaging 5.7 months, and only 15% obtain this care in the first trimester and 52% by the sixth month of pregnancy (KDHS, 2008-09). According to the FANC, only 47% of all pregnant women in Kenya achieved the minimum of four visits and this has declined since 2003 (FANC 2007). This is also similar to another Kenyan study by Ouma *et al.*, which showed that 47% of all pregnant mothers from some Kenyan regions still attending ANC clinics only once or very late in their pregnancy (Ouma *et al.*, (2010).

This trend is similar to other studies carried out in Sub Saharan Africa by different authors. Anders *et al.*, Tanzanian study found that not more than half of all pregnant women first attend ANC during or before the fourth month of gestation (Anders *et al.*, 2008). A Ugandan study on rural women showed that less than 8% of expectant women attend ANC during the first trimester. Furthermore, 57.7% of all ANC women initially visit clinic during the 2nd trimester and 33.5% during the 3rd trimester with 37.1% making at least four ANC visits (Kiwuwa and Mufubenga, 2008). Another study in Ethiopia

found that 42.8% of the pregnant women make their first ANC visit in the 3rd trimester and 6.5% of all women attain the recommended four visits (Fekede, 2007).

In our study, the mean gestational age was 29±8 weeks and the gestational age at the start of ANC was 23±8.2 weeks. This is similar to and also contrasts various studies done in Nigeria which showed mixed trend. Adebala (2009), the mean gestation was 19.1± 7.8 weeks though it was varying with parity. Among nulliparous and primiparous women, the mean was 18.5± 8.3 and 18.4 +/- 7.4 weeks respectively. However, Only 27% book by end of first trimester, while the majority (55.2%) book in the second (14 to 26 weeks gestation). Furthermore, up to 8% of women have their first antenatal visit after the 34th gestational week. Akee and Audu (1998) had previously found the average gestational age at first antenatal attendance to be 23.5 +/- 6.0 weeks. Nwagha et al., study done in 2008 found that the average gestational age at booking for ANC was 26.12±7.6 weeks. Gestational age at first visit for primigravidae was found to be 24.0±7.9 weeks while that for multigravidae was 27.16±7.5 weeks, with the grand multiparous women averagely coming at 26.12±7.6 weeks (Nwagha et al., 2008). Okunloha *et al.* study done in 2006 found the mean gestational age at booking to be 21.82±7.0 weeks and that only 14.1% of women booked before 14 weeks (Okunloha *et al.*, 2006).

The analysis of qualitative data (focus group) showed that health seeking behaviour of pregnant women is negatively affecting utilization of ANC services during the first trimester in Kosirai Division. Most pregnant women don't present with any complains during the first trimester and therefore do not seek ANC services since they are healthy. Furthermore, most of them may not notice that they are pregnant early enough to attend ANC within 12 weeks. A key informant revealed that some cultural factors were also identified as negatively affecting uptake of ANC services during the first trimester. The community views mothers delivering at home as stronger women, hence more respected, than those delivering in the hospital.

5.2. Socio-cultural factors associated with utilization of ANC services in the first trimester

The uptake of ANC services among women during the first trimester at Kosirai division is low and this may be attributed to socio-economic and demographic factors. These factors associated with failure to initiate ANC early are fairly related between different countries and regions globally. The test for association revealed that the source of income was significantly associated with ANC attendance during the first trimester among expectant women at Kosirai division. The participants whose source of income is formal employment have 3 times, 3.08(1.07, 8.89), increased chance of attending ANC during the first trimester compared to those who are self-employed or have other sources of income. This is consistent with al-Shamari et al. (1994) and Erci (2003) and Quelopana *et al.* (2009) which found that family income and low economic status affects the utilization of antenatal services. The study found that those with higher annual income (mostly in - formal employment) tend to attend ANC services more frequently during the first trimester than those with lower annual income (non-formal or self-employment). This could be attributed to their higher purchasing power as well as their high willingness to pay for ANC services. This is consistent with KDHS 07-08 findings, which indicated that wealthier women attend ANC more frequently than women of lower economic status.

It is also consistent with Kambarami et al findings which found that income, a determinant of ability to pay for ANC services including transport services, to be a significant factor. Up to quarter of all women were not able to pay for ANC come late for their first ANC visits (Kambarami *et al.*, 1999).

The education level of the respondent was not significant. The study found that there is no statistical difference in utilization of ANC services in Kosirai division among women with university level education and those in secondary, primary or none. However, there was a trend that those with secondary education level and above tend to seek ANC services more frequently compared to lower qualified counter parts. This could be due to the effect of awareness and knowledge on importance of ANC services among the respondents, which may not be directly related to education level. There could also be

other confounding factors such as the new government policy on free maternity services and the media campaigns.

This, therefore, contrast van Eijk et al., (2006); Sunil, (2010) and Sein, (2011) studies which have found socio-economic status and low education levels to be associated with low number of ANC visits by pregnant women. It also contrast Kenya Demographic Health Survey (KDHS) 2007-08 findings which showed that women with higher education are much more likely to receive ANC services and that the proportion of women who do not get the ANC service declines steadily as education increases. The KDHS 2007-08 findings showed that one-quarter of women with no education get no ANC services at all.

It also contrast Kambarami et al findings which showed that less educated women tend to miss ANC services more compared to educated ones. Less educated women tend to make very small role in decision-making and on perception about the need for ANC, and income on ANC visitation (Hafez *et al.*, 1999). Elsewhere, studies have found that equal proportions of women themselves and husbands are commonly the decision makers regarding starting ANC, and the delay could be associated with the wait for the decision maker to do so. Additionally, about a quarter of all women are not able to pay for ANC hence late first visits (Kambarami *et al.*, 1999). A study from Bangladesh variously found that perception of actual roles for ANC services and levels of knowledge on ANC issues were low amongst husbands making them less supportive, so that women are likely to attend clinic late into the pregnancy and adhere less to the scheduled visits for lack of partner support (Rahman *et al.*, 2012).

Although the mother's age at pregnancy and child birth order were not significantly associated with uptake of ante natal care services during the first trimester, there was a trend that younger women less than 35 years and mostly of lower parity tend to make more ANC visits compared to older and higher parity women. This is similar to the findings of (KDHS, 2007-8) which showed that the mother's age at birth and the child's birth order were not strongly related to use of ANC, except that high-parity women are more likely than low-parity women to miss ANC. This could be due to curiosity and or

anxiety among younger women about state of pregnancy compared to experienced, older and higher parity women.

The occupation of the respondents was not statistically significant determinant of utilization of ANC care services. There was no difference among those who reported that they are in formal employment and those who either reported that they are in self employment or non- formal employment. There was, however, a trend that more women with formal employment attend ANC services more than those in self employment or non-formal employment. This is similar to Nwagha et al (2008) that found that in Nigeria, occupation did not have significant influence on gestational age at booking. A different study however indicated that gainful employment of client increase the likelihood of positive perception and search of ANC (Oladapo and Osiberu, 2008; Quelopana, 2009). In Nigeria, Adegbala (2009) found that women in higher social class (mostly in good paying jobs) have been found to book for ANC earlier than those from other social classes (self-employment or non-formal employment). This also contrast Erci, 2003; van Eijk et al., 2006; Sunil, 2010; and Sein, 2011 studies which found that socio-economic factors such as occupation of the mothers to be significantly affecting uptake of ANC services. Occupation is also an indirect determinant of income levels, which was found in this study to be significantly affecting uptake of ANC services.

Mothers' history of smoking was not significantly affecting uptake of ANC services. Smoking is a habit more of a health seeking behaviour. It affects the growth of the foetus negatively but this study didn't show any role of smoking in utilization of ANC services because their numbers were very small or the habit cuts across all cadres of women.

Distance to health facilities was not statistically significant in this study. This contrast Islam and Odland study which suggested that distance to health facilities is an important determinants of maternal healthcare-seeking behaviour and affect ANC services utilization especially at the village level (Islam and Odland, 2011). It also contrast Mwaniki et al findings which indicated that the more far distance a woman has to cover to a health facility – especially where it is above 5 km, is associated with failure of or late ANC attendance (Mwaniki et al., 2002). In this study, this scenario could be explain by the fact that the perception of the quality of services in such facilities out weights their

distances. There were closer, often less than 5km distance facilities but women could not seek ANC services in such health facilities because of the perceived poor quality services. An analysis of qualitative data showed that there is only one functional maternity in Kosirai division and that physical accessibility of Mosoriot health centre is much easier compared to other rural health facilities in Kosirai Division. This could explain why Mosoriot health hospital was most preferred facility despite its distance and the existence of other lower level facilities offering ANC services.

The religion of the respondents was not statistically significant determinant of utilization of ANC services during the first trimester among women at Kosirai Division. This could be attributed to the fact that majority of the women in Kosirai were mainly Christians hence could not establish the difference among religious groups. This contrast (Oladapo and Osiberu, 2008; Quelopana, 2009) Nigerian studies which found Islamic faith to be negatively influencing uptake of ANC services, among other factors. It is known that Christian teachings and practices do not hinder uptake of antenatal care services among women.

The husband influence on ANC uptake was not significant determinant among the married women. However, those who reported greater influence of husband in ANC attendance showed decrease chance (OR-0.67) of seeking ANC services compared to those who reported no influence of husband in ANC uptake. This could be explained by the fact the decision to seek ANC services are delayed by slow decision making and or consultation between husband and wife. This is consistent with Hafez et al., findings that showed that husband influence could affect the uptake of ANC services. The husband's role of decision-making, his perception about the need for ANC, and expense of ANC visitation are the issues women face in seeking antenatal care services (Hafez et al., 1999).

It is also consistent with Kambarani et al finding which indicated that husbands are commonly the decision makers regarding starting ANC, and the delay could be associated with the wait for the decision maker to do so (Kambarani et al., 1999). Other studies have analyzed the role of mother in law in uptake of ANC services. In Nepal, mothers-in-law play a negative role in the decisions around accessing health care

facilities and providers, and do not support/encourage ANC check-ups. They expect pregnant daughters-in-law keep fulfilling their household duties instead of having time to visit ANC clinic, with perceptions that ANC is not beneficial based largely on their own past experiences (Simkhada et al., 2010). However, this study did not study the role of mother in law in uptake of ANC services.

A study from Bangladesh variously found that perception of actual roles for ANC services and levels of knowledge on ANC issues were low amongst husbands making them less supportive, so that women are likely to attend clinic late into the pregnancy and adhere less to the scheduled visits for lack of partner support (Rahman et al., 2012).

The role of traditional birth attendants were not statistically significant and there was no notable differences in utilization of ANC services among those who view TBA as good or negative practice. This is inconsistent with other studies, which has shown that cultural factors including TBA are significant factors affecting uptake of ANC services negatively. This contrast Islam and Odland study findings which showed that cultural issues, including TBA roles are important determinants of maternal healthcare-seeking behaviour and affect ANC services utilization (Islam and Odland, 2011). According to Ngomane and Mulaudzi (2010) South African study, pregnancy is traditionally viewed as an honour and needs efforts to preserve it, attendance of antenatal clinics is faced with fear of bewitchment causing delayed attendance. Women thus use herbs to preserve and protect their unborn infants from harm and also prefer traditional birth attendants to the harsh treatment that they receive from midwives in health facilities (Ngomane and Mulaudzi, 2010), this contributes to the when women first seek ANC services. Other studies also have emphasized the role of culture on use and failure to use ANC services (Simkhada *et al.*, 2008).

The mode of transport was not associated with uptake of ANC services. This could be explained by the fact that there are public service vehicles which are readily available so long as you have fare. This makes no difference among those with vehicle and those without. However, those who travel by foot to health facilities, either because they do not afford due to fare were less likely to seek ANC services (OR=0.67). This is thus

consistent with al-Shamari et al which showed that income and ability to pay for services affects utilization of ANC services.

Kosirai division is relatively a rural setting and most women in rural areas attend their first antenatal clinic late in pregnancy and fail to return for any follow-up care, notes that women who do not perceive significant health threats during pregnancy view more than one ANC visit as unnecessary. This has also been observed in South Africa by Myer and Harrison (2003).

5.3 Institutional factors influencing uptake of ANC services

The common institutional factors that were mentioned in this study were ownership of facility (public or private), recognition of the facility by NHIF and other insurance providers, and the service fees they charge.

Although they were statistically not significant, there was a trend in its utilization. Public facilities that were charging only Kshs. 100 were up to 2 times more likely to be visited by the mothers compared to those private one charging more services fee. This finding is similar to al-Shamari et al. (1994) who indicated that affordability is a significant factor in uptake of ANC services. However, the study did not specifically analyze the first trimester period only but the term. This is also consistent with KDHS 07-08 findings which showed marked regional variations in ANC coverage in the Kenya based mainly on affordability, with over one-quarter of women in North Eastern province not getting any care at all due to access (KDHS 07/08).

Furthermore, the surveys indicate that up to 83% of all women who receive ANC obtain the same from government facilities (KDHS 2008-09).

Mosoriot health centre was the preferred choice for many with 20 times likelihood of seeking ANC there by expectant women. This is because of the perceived quality benefits from the health care providers and that any occurrence of complication(s) can easily be sorted out. This however contrasts Ngombane and Mulaudzi study in South Africa, Pregnancy is viewed as an honour and needs efforts to preserve it, attendance of antenatal clinics is faced with fear of bewitchment causing delayed attendance. Women thus use herbs to preserve and protect their unborn infants from harm and also prefer traditional

birth attendants to the harsh treatment that they receive from midwives in health facilities (Ngomane and Mulaudzi, 2010).

The infrastructural status of the facility is an important determinant in uptake of ANC services with Mosoriot considered better equipped unlike other health facilities in Kosirai. The 20% more likelihood of its use is determinant, though not significant in maternal healthcare-seeking behaviour and affect ANC services utilization. This finding is consistent with Islam and Odland 2011 findings which showed higher utilization in highly equipped health facilities compared to poor infrastructural ones. However, Petrouet al has further shown that women booked into teaching as opposed to non-teaching facilities to attend clinic fewer times. There were no teaching facilities in Kosirai division.

Our study showed that those who did not get ANC care services previously in clinic after attending the facility had a tendency toward reduced chance of attending ANC during the first trimester (OR 0.41(0.13, 1.25). Analysis of qualitative data revealed that shortage of staff, lack of lab reagents e.g. for VDRL, HIV test kits, inadequate examination rooms, long waiting time and bad staff attitude towards pregnant women affects negatively on utilization ANC services.

This has been shown by other studies, which found that satisfaction with ANC services is a major determinant of health service utilization in general, with low utilization of ANC services associated with low satisfaction (Aldana *et al.*, 2001). Furthermore, patient satisfaction is a component of quality of care that has been given high priority in antenatal and maternity care in developed countries (Van Teijlingen *et al.* 2003), unlike in many developing countries. The present study findings is also consistent with Mwaniki *et al.*, Kenyan study that found that lack of satisfaction with quality of antenatal care can be a major demotivating factor in the use of ANC services in Kenya. This include complaints about the services offered included shortage of drugs and essential supplies, lack of commitment by staff, poor quality of food and lack of cleanliness (Mwaniki *et al.* 2002).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

- There is 52% utilization of ANC services in Kosirai division during the first trimester compared to KDHS' 08-09 15%, KDHS 2014 20% and FANC 100%.
- Source of income was the only significant factor affecting uptake of ANC services during the first trimester. Those with higher income tend to utilize ANC services.
- The institutional factors were not significant factors in uptake of ANC services, although there was a trend towards more well infrastructure facilities (Mosoriot Health Centre)

6.2 Recommendations

- Sensitize population and create awareness on importance of early ANC attendanc.
- Emphasis on the role of community leaders in empowering pregnant women to seek ANC services much early in order to reduce pregnancy associated complications.
- Stakeholders' engagement in early ANC attendance through education and sensitization both in ANC matters and other health related concerns.

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APPENDIX 1: INFORMED CONSENT FORM

Hello, my name is **Monica Limo** and am a postgraduate student in the school of public health, Moi University.

Purpose and background:

As partial fulfilment of the master's degree, am required to undertake a dissertation and research. My dissertation is on Factors Associated with ANC Utilization by Women in the First Trimester of Pregnancy in Kosirai Division, Nandi County, Kenya. The study aims to identify challenges faced by pregnant women in their quest to achieve ANC services in Kosirai division of Nandi County. This study recommendation may be used by government and policy makers to design maternal health programs and policies that may improve maternal health outcomes.

Procedure:

If you consent to, you will be interviewed for about 15 to 20 minutes with a sole aim of eliciting information to meet the purpose of study.

Benefits and Risks

There will be no direct benefit from participating in the study. However, findings of this study will be useful in the overall planning of ANC delivery and utilization by women in our communities.

Confidentiality:

All information will be considered confidential, and all consent forms used kept in a locked secure location to prevent loss of confidentiality to participants.

Right to refuse or withdraw:

Your participation in the study is entirely voluntary and you are free to refuse to take part or withdraw at any time.

If you consent, please indicate so by signing this form:

Signature: Date:.....

KIAMBATISHO 1:FOMU YA IDHINI

Hello, jina langu ni Monica Limonani mwanafunzi washahada ya uzamilika tika shule ya afya ya umma, Chuo Kikuu cha Moi.

KUSUDI

Kamakutimia nusuyashahada ya, mimi nataka wakufanyadissertation nautafiti. Dissertation yangu ni juu ya Mambo Yanayohusiana na Matumizi ya ANC na Wanawake katika miezi mitatu ya kwanzaya Mimbakatika Idara ya Kosirai, Nandi County, Kenya. Utafiti inalengakuainishachangamoto zinazowakabili wanawake waja wazito katika jitihada zao za kufikia huduma za ANC katika Kosira ingawanyiko wa Nandi County. Mapendekezo ya utafiti huu inaweza kutumiwa nawa tungasera nakerikaliwa kubuni programu za afyaya uzazi nasera ambazo zinaweza kuboresha matokeo ya afya ya uzazi.

UTARATIBU:

Kama unaidhinisha, utahojiwa kwa muda wa dakika 15- 20 na lengo la pekee yakukutana namadhumuni ya utafiti.

Faida

Kutakuwahakuna faida ya moja kwa moja kutokana na kushiriki katika utafiti. Hata hivyo, matokeo ya utafiti huu itakuwa muhimu katika mipangoya jumla ya ANC namatumizi katika jamii zetu.

USIRI:

Taarifa zote yatazingatiwa kwa siri, nafomu za kutumika katika eneo zitafungwa salama kuzuia hasara ya usirikwa washiriki.

HAKI YA KUKATAAAU KUTOKA:

Ushiriki wakokatika utafitini kabisawa hiari nawewe ni huru wakukataa kuchukuasehemu au kutoka wakati wowote.

Kamawewe utaidhini, tafadhali nyeshahivyokwa kuta sahihi fomu hii:

Sahihi:.....Tarehe:.....

APPENDIX 2:INTERVIEWER ADMINISTERED QUESTIONNAIRE

(Face to Face interview)

SECTION A: DEMOGRAPHIC DATA

- 1) What is your age? 15-24yrs25-34 yrs 35-49yrsover49yrs
- 2) What is your marital status?Married: Single Divorced separatedWidowed
- 3). How many children do you have? Please specify.....
- (4) What is your religion? Christian Muslim Hindu others, please specify.....
- (5) What is your occupation Employed Self Employed Unemployed
- 6) What is your highest level of Education: Primary Secondary College/university?
7. Whats is the source of income? Self employed Formal employment others, please specify.....
8. If married what is the source of income for husband? Self employed Formal employmentothers, please specify.....
- 9.a)Which type of house do you live in? (a) Personal (b) Rental (c) Morgaged
b)as per question 8a above, What type of housing is it? (a) Permanent house (b)Semi permanent/mud/grass thatched house
c)If rental, how much do you pay per month
(please specify) kshs
10. Do you own land? (a) Yes (b) No, if yes, please specify the number of acres.....
11. What is the source of water (a) pipe water (b) River (c) well (d) bore hole (e) Tank
12. Do you have electricity (a) Yes (b) No
13. If no to question 11 above, what do use? (a)firewood(b) pressure/kerosine lamb (c) generator (d) Others, please specify.....
14. Do you own the following, (a) motor vehicle (b) Motor bike (c) bicycle (d) fridge (e) phone
15. Do you smoke cigarette? (a) Yes (b) No (c)No response

16. Do you drink alcohol? (a) Yes (b) No (c) No response
17. How many pregnancies have you ever had? First Primigravida more than one/Multigravida
- 18) What is the distance to ANC facility: 0-1km 2-5km 6-10km over 10km
- (19) What is your mode of transport to clinic when seeking ANC services? Private vehicle Public service vehicle motor cycle/bicycle Foot Donkey/camel (f) Others (Please specify).....
- (10) Do you know any health facility offering ANC and PNC services? Yes No
If yes, indicate the name(s).....
11. Have you ever attended a health facility for ANC services and failed to be attended? Yes No don't remember
12. If yes to question 11 above, what was the reason? Lack/absence of staff lack of medical supplies Long waiting time Attitude of staff Inadequate laboratory equipments (f) others, (please specify).....
13. If yes to question 11. Did you ever seek ANC services thereafter? Yes No Don't remember
14. Who attended to you when you were seeking ANC services? Medical doctor Clinical officer Nurse (d) Nutritionist Others (specify).....
- 15) At what gestational age are you currently?.....
.....
- 16) At what gestational age did you start attending ANC?.....
- 16b). If at term, how many times did you attend ANC clinic once twice thrice 4 times
- 17) In your previous pregnancy did you attend ANC? Yes No Don't remember
- 18) If yes to question 17, at what gestation age did you attend the clinic? 0- 16th week 17 – 32 33-40
- 19) If no to question 17, please state the reasons?
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20.If started clinic after 12th week, what are the reasons for not attending it during first trimester?.....

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21. What is your view on ANC attendance?.....

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22. What is the nature of the health facility you attend? (a) Private (b) public health (c) Others (please specify).....

23. What are the reasons for your choices of your clinic in question 22 above?.....

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24.25. How much are you charged at the health facility before you are given the service?

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.....

25. Did you find the charges of ANC services affordable to you (a) Yes (b) No (c) don't know?

26. Do you have an ANC card?(a)Yes (b) No

27. If No, why?.....
.....
.....
.....

28 Do you have any insurance for your health care financing (a) yes (b) No (c) don't know

29. If yes to question 28, what type of health insurance do you have? (a) NHIF (b) Private insurance (c) Community based insurance (d)Others, specify,.....

KIAMBATISHO 2: MAHOJIANO

SEHEMU A: Idadi za Lazima (demographics)

- 1) Je, una umri gani? 15-24 25-34 35-49 juu ya 49
- 2) Nini hadhi yako ya ndoa? umeolewa: Single talaka waliojitenga Mjane
- (3) Je, nini dini yako? ya Kikristo Muslim Hindu nyingine, tafadhali taja
.....
- (4) Ni nini kazi yako kuhajiriwa ajira ya binafsi bila ajira yoyote
- 5) Je, nini ngazi ya juu ya Elimu yako: Msingi Sekondari Chuo kikuu?
6. Kama umeolewa ni nini chanzo cha mapato kwa mume? (A) Ajira ya binafsi
(B) Rasmi ajira (c) nyingine, tafadhali taja
7. Je una mimba ngapi? mimbaya Kwanza / Primigravida (b) zaidi ya moja /
Multigravida
- 8) Umbali wa kituo ANC: 0-1km 2-5km 6-10km juu ya 10km
- (9) Je, nini mode yako ya usafiri kwa kliniki wakati wa kutafuta huduma ya ANC? gari
ya binafsi gari ya umma baiskeli Foot Punda / ngamia (f) Wengine (Tafadhali
taja)
- (10) Je, unajua kituo chochote cha afya kinachopeana huduma ya ANC na huduma ya
PNC? Ndiyo Hakuna
Kama ndiyo, zinaonyesha jina (s)
11. Je, umewahi kuhudhuria kituo cha afya kwa ajili ya ANC huduma na ukakosa
kuhudhuriwa? Ndiyo Hakuna sikumbuki
12. Kama ndiyo kwa swali 11 hapo juu, nini ilikuwa sababu? Ukosefu wa wafanyakazi
ukosefu wa vifaa vya matibabu muda mrefu wa kusubiri Tabia ya wafanyakazi
Ukosefu wa vifaa nyingine, (tafadhali taja)
-
13. Kama ndiyo kwa swali 11. Uliwahi kutafuta huduma ANC baada ya hapo? Ndiyo
Hakuna sikumbuki
14. Nani alihudhuria wewe wakati ulipokuwa unatafuta huduma? daktari afisa wa
afya (clinical officer) Muuguzi afisa wa lishe wengineyo (taja)
.....

15) una mimba wa miezi ngapi sasa?

.....

16) je, ulianza kuhudhuria ANC ukiwa na miezi ngapi?

17) Katika mimba yako ya zamani ulisudhuria ANC? (A) Ndiyo (b) Hakuna (C)

sikumbuki

18) Kama ndiyo kwa swali 17, ulianzakuhudhuria kliniki ukiwa na mimba wa umri gani

(A) 0 - 16 wiki (b) 17-32 (c) 33-40

19) Kama la kwa swali 17, tafadhali taja sababu?

20. Kama ulianza kliniki baada ya wiki 12, ni nini sababu za kutohudhuria kwa miezi tatu za kwanza?

21. Nini maoni yako juu ya mahudhurio ya ANC?

.....

22. Nini asili ya kituo cha afya unaohudhuria? Binafsi afya ya umma nyingine

(tafadhali taja

23. Je, ni sababu gani ya uchaguzi wako wa zahanati yako katika swali

22.....

24. Ni kiasi gani cha pesa unaolipishwa katika kituo cha afya kabla ya wewe kupewa huduma?

25. Je unapata huduma wa ANC nafuu kwa wewe Ndiyo Hakuna sijui

26. Je, una kadi ya ANC? Ndiyo Hakuna

28 Je, una bima ya afya kwa fedha yako ya hudumandiyo Hakuna hawajui

29. kama ndiyo kwa swali 28, ni aina gani ya bima ya afya ya kufanya? NHIF bima

ya Binafsibima ya Jumuiya ya kijamii nyingine, bayana,

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APPENDIX 2 /KEY INFORMANT INTERVIEW

(A permission and a verbal consent will be sought from each of the in charges (nursing officer in charge, clinical officer in charge and DMOH of the facility). The interview will take 15 to 20 minutes.)

Hello, my name is **Monica Limo** and am a postgraduate student in the school of public health, Moi University.

Purpose and background:

As partial fulfilment of the master’s degree, am required to undertake a dissertation and research. My dissertation is on Factors Associated with ANC Utilization by Women in the First Trimester of Pregnancy in Kosirai Division, Nandi County, Kenya. The study aims to identify challenges faced by pregnant women in their quest to achieve ANC services in Kosirai division of Nandi County. This study recommendation may be used by government and policy makers to design maternal health programs and policies that may improve maternal health outcomes.

I will interview you on ANC utilization by women in Kosiari division and how the health facilities are coping with provision of ANC services

1. What is the level of utilization of ANC services in this facility?.....
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.....

1. What is the Human capacity of your health facility in handling of ANC services(fill the table as shown below)

Cadre of staff	Number
Medical officers	
Clinical officers	
Nurse	
Laboratory technologist	

2. What is the status of infrastructural capacity of our health facilities in Kosirai Division?

Number of delivery rooms.....

Number of consultation rooms.....

Availability of theatre (a) Yes (b) No

Availability of examination coaches (a) Yes (b) No

Availability of incinerators (a) Yes (b) No

Stocking of pharmaceutical drugs and reagent (a) well stocked (b) poorly stocked

Provision of Mosquito nets incentives (a) Yes (b) No

Others, please specify

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3. What is your opinion on clear hospital policy on ANC service delivery? Is it effective?

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4. What are the main challenges facing health facilities in implementation of ANC policy.....

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5. On average what ,at what gestational age do women seek ANC services in Kosirai division?.....

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6. What are the roles of community leaders in implementing ANC service utilization policy? Has it been working?.....

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7. Are you conversant with community health strategy? And if yes, how is its implementation especially concerning maternal and neonatal health in Kosirai Division.....

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8. How is the status of institutions' health infrastructure and transport in Kosirai division?.....

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9. How accessible are health facilities to pregnant women in Kosirai division?.....

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10. What are main challenges facing your advocacy or promotion of utilization of ANC services by women in Kosirai division.....

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11. What are the specific challenges facing utilization of ANC services during the first trimester?.....

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12. What are your suggestions or recommendations towards improving utilization of ANC services by pregnant women during the first trimester.....

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Any other comments?.....

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APPENDIX 3: FOCUS GROUP DISCUSSION

A verbal consent will be sought from each of the participants and participants informed that the discussion will be recorded for purposes of transcription. The participants will include selected pregnant women.

Hello, my name is **Monica Limo** and am a postgraduate student in the school of public health, Moi University

Purpose and background:

As partial fulfilment of the master’s degree, am required to undertake a dissertation and research. My dissertation ison Factors Associated with ANC Utilization by Women in the First Trimester of Pregnancy in Kosirai Division, Nandi County, Kenya. The study aims to identify challenges faced by pregnant women in their quest to achieve ANC services in Kosirai division of Nandi County. This study recommendation may be used by government and policy makers to design maternal health programs and policies that may improve maternal health outcomes.

1. How is the utilization (uptake) of ANC services by women in Kosirai division?

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2. On average, at what gestational age do women seek ANC services in Kosirai division?

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3. What are the factors affecting women’s gestational timing of attendance to ANC services in Kosirai Division?.....

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4. How is the provision of ANC services in Health facilities in Kosirai Division?.....

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5. How is the financing of ANC services among women in Kosirai division?.....

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6. What are the cultural practices (rituals, traditions, beliefs and customs) in your community that affect ANC services by pregnant women?.....

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7. Are the women in this community aware of the government policies related to ANC utilization?

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KIAMBATISHIO 3: MAZUNGUMZO YA MAKUNDI LENGWA

Idhini ya kuendeleza zoezi hili kutoka kila mmoja wa washiriki utaombwa na washiriki waarifiwa kwamba majadiliano itakuwa taped kwa madhumuni ya transcription. Hello, jina langu ni Monica Limo na ni mwanafunzi wa shahada ya uzamili katika shule ya afya ya umma, Chuo Kikuu cha Moi

KUSUDI NA HISTORIA

kwa madhumuni ya kupewa shahada, mimi natakiwa kufanya dissertation na utafiti. Dissertation yangu ni juu ya Mambo Yanayohusiana na Matumizi ya ANC na Wanawake katika miezi mitatu ya kwanza ya Mimba katika idara ya Kosirai, Nandi County, Kenya. utafiti inalenga kuainisha changamoto zinazowakabili wanawake wajawazito katika jitihada zao za kufikia huduma za ANC katika Kosirai mgawanyiko wa Nandi County. Mapendekezo ya utafiti huu inaweza kutumiwa na watunga sera na serikali wa kubuni programu za afya ya uzazi na sera ambazo zinaweza kuboresha matokeo ya afya ya uzazi.

1. Ni Jinsi gani huduma za ANC kwa wanawake katika mgawanyiko Kosirai utumiwa?
2. Kwa wastani, ni umri gani ya ujauzito kwa wanawake kuanza huduma za ANC katika mgawanyiko Kosirai?
3. Ni mambo gani yanayoathiri wanawake wajawazito kuhudhuria ANC katika Idara Kosirai?
4. Je ,hali ya utoaji wa huduma katika vituo vya ANC katika Kosirai iko namna gani?
5. Je ni ufadhili upi wa huduma miongoni mwa wanawake wa ANC katika mgawanyiko Kosirai?
6. Je ni masuala ipi ya jamii ya kitamaduni, kama wapo, ambayo unadhani kuathiri matumizi ya huduma za ANC kwa wanawake wajawazito?
7. Je wanawake katika jamii hii wanafahamu sera za serikali yanohusiana na matumizi ya ANC

KIAMBATISHO 4: MAHOJIANO KWA MWENYWE MAONI KUU

Hello, jina langu ni Monica Limo na ni mwanafunzi wa shahada ya uzamili katika shule ya afya ya umma, Chuo Kikuu cha Moi.

KUSUDI NA BACKGROUND:

kwa madhumuni ya kupewa shahada ya masters, mimi natakiwa kufanya dissertation na utafiti. Dissertation yangu ni juu ya Mambo Yanayohusiana na Matumizi ya ANC na Wanawake katika miezi mitatu ya kwanza ya Mimba katika Kosirai Idara, Nandi County, Kenya. utafiti inalenga kuainisha changamoto zinazowakabili wanawake wajawazito katika jitihada zao za kufikia huduma za ANC katika Kosirai mgawanyiko wa Nandi County. Mapendekezo ya utafiti huu inaweza kutumiwa na watunga sera na serikali wa kubuni programu za afya ya uzazi na sera ambazo zinaweza kuboresha matokeo ya afya ya uzazi.

Nitahoji wewe juu ya matumizi ya ANC na wanawake katika mgawanyiko Kosirai na jinsi huduma za afya na kukabiliana na utoaji wa huduma za ANC

1. Je, nini uwezo ya wafanyi kazi wa afya kwa kituo chako katika utunzaji wa huduma yaANC?.....

2.nini ni hali ya uwezo wa miundombinu ya huduma zetu za afya katika Idara Kosirai?.....

.....

...

3. Nini maoni yako juu ya sera ya wazi juu ya hospitali ANC utoaji wa huduma? Je ni efefctive?.....

.....

4. Je, nini changamoto kuu zinazowakabili vituo vya afya katika utekelezaji wa ANC.....

.....
5. Ni kiwango gani matumizi ya huduma za ANC kwa wanawake wajawazito katika Kosirai upeanwa?

6. Je nini majukumu ya viongozi wa jamii katika utekelezaji wa ANC huduma matumizi sera? Je imefanya kazi?

7. Je, wewe ni conversant na jumuiya ya mkakati wa afya? na kama ndiyo, ni jinsi gani imetekelezwa hasa kuhusu uzazi na afya ya utotoni katika

Kosirai.....
.....

8. Ni jinsi gani kwa hali ya miundombinu ya afya taasisi 'na usafiri katika

Kosirai.....
.....

9. Hali ya kupatikana kwa afya kwa wanawake wajawazito katika Kosirai ni namna gani?.....
.....

10. Je, changamoto kuu zinazokabili utetezi wako au uendelezaji wa matumizi ya huduma ya ANC kwa wanawake katika mgawanyiko Kosirai . ni zipi?.....
.....

11. Je, ni changamoto zipi zinakabili matumizi ya huduma za ANC wakati wa kwanza.....
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12. Je, nini mapendekezo yako katika kuboresha matumizi ya huduma za ANC kwa wanawake wajawazito wakati wa miezi tatu za kwanza.....
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Maoni yoyote nyingine?