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BY

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"*THE DETERMINANTS OF MATERNAL HEALTH CARE SERVICES UTILIZATION: THE CASE OF ANDABET WOREDA.*"

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ALMAW TIGABU

A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS, BAHIR DAR UNIVERSITY, IN PARTIAL FULFILLMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN APPLIED DEVELOPMENT ECONOMICS

JUNE , 2012

BAHIR DAR

ACKNOWLEDGMENT

I would like to thank Nega Ejigu, my principal advisor, for his comments on the main idea of the paper since the early stages of the work and for his subsequent and unreserved support in the whole process of this work.I could say that no words can express his frequent assistance and close supervision throughout this thesis.

My gratitude also goes to Amhara national regional state and the unforgettable Andabet& Lay Gaint Woreda people and administration for their permission to attend this program at Bahirdar University.WABI children aid and training project founder Ato Mestika Negash, Project staff and beneficiary childen of the project are always in my heart.

My special thanks go to my mother W/ro Birkie Mengesha, my wife W/ro Serkie sema, and my son Robel Almaw and brothers Dr Eyaya Misgan and Habtamu Kefyalew for their encouragement and financial support.

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ACRONYMS

ANC----------Antenatal Care

ASE----------The attitudes-social influence-self –efficiency

CSA----------Central Statics Agency

EDHS----------Ethiopian Demographic and Health survey

FMoH----------Federal Ministry of Health

PNC----------Postnatal Care

MHCS----------Maternal health care services

MMR----------Maternal mortality ratio

TBA----------Traditional birth attendant

UNFPA----------United Nations Fund for population Affairs

UNICEF----------United Nations international children's fund

WHO---------- World Health Organization

ABSTRACT

To improve maternal health care services, it is very important to understand the main factors deterring maternal health care services utilization in rural areas like Andabet. Maternal health care services could save unnecessary severe complications and death among women during pregnancy, delivery and postnatal care. Thus, the purpose of this study is to investigate the socio-economic and demographic factors that affect women's use of maternal health care services in Andabet Woreda of Amhara national regional state by using logistic regression analysis for the primary cross sectional data collected through a designed questionnaire

The analysis of the data confirmed that age of the mother, primary, secondary and more than secondary education level of the mother, household head occupation, community insurance membership, residence and the middle, rich and richest wealth quintiles had a significant relationship with the utilization of antenatal care services. Women primary and above secondary education, the rich and richest wealth quintiles and household head occupation strongly determine the maternal health care utilization of delivery care. Again from the analysis it was found that age of the mother in the age category of 35-49, birth order of more than 5 children, primary education, middle and rich wealth quintile , community based health insurance and residence significantly determine postnatal care service. The interesting finding in this study is local network membership did not have significant impact on the probability of women obtaining antenatal care, institutional delivery service and postnatal care.

Based on the findings, to improve the utilization of maternity care services, it is suggested that comprehensive efforts have to be made to create awareness about the benefits of utilization of maternal health care service and investment in female education and enhancing women's income in particular and house hold income in general.

Key words: Maternal health care service, Antenatal care, Delivery, postnatal care

CHAPTER ONE

INTRODUCTION

1. 1Background

World health organization (WHO) defined that maternal health is the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, Preconception, prenatal and postnatal care in order to reduce maternal morbidity and mortality. Antenatal care (ANC), child birth (institutional delivery) and post-natal care (PNC) are major services that MHCS comprises of in order to prevent and reduce the incidence of maternal morbidity and mortality. In a more comprehensive way maternal health is a state of complete physical, mental and social wellbeing of the mother (Family Care International, 2007, WHO, 2008).

Maternal health (MH) is important to communities, families and the nation due to its profound effects on the health of women, immediate survival of the newborn and long term well-being of children and families and thus has a long term effect on creating healthy generation. As women have a key role in the rearing of children and the management of family affairs their death and illness have cost implications for family and the community because of high direct and indirect costs, the adverse impact on productivity and the tremendous human tragedy that every maternal or child death represents (Global guideline on maternal health , 2009).

Investing in maternal health is a prudent health and economic policy decision. Women are the main income earners in nearly one third of all households in the world. There are leak out macro-economic repayments from the women whose lives are improved by maternal health interventions. Many maternal care interventions are verified to be both effective in dropping maternal death and gainful, especially for high-risk groups (African progress panel, 2010).Worldwide over 500,000 (half a million) women die as a result of childbirth and complication due to pregnancy. Almost all of these deaths occur in developing countries. Asia and Africa alone take 95% of the share of the world's maternal death (AbouZahr, 2003).

Sustainable Development Goal 3(SDG3), calls for the global improvement in maternal health, with a target of reducing the maternal mortality ratio from its high rate of 216 per 100,000 live births by the end of MDGs in 2015 to 70 per 100,000 live births in 2030 (UN,2015). Accordingly, the Federal Ministry of Health (FMoH) has applied a multi-pronged approach to reduce maternal and newborn morbidity and mortality by improving access to and strengthening facility-based maternal and newborn services.

In Ethiopia, the levels of maternal and infant mortality and morbidity are among the highest in the world being among the most six burden countries (India, Nigeria Afghanistan, Pakistan and democratic Republic of Congo) (ORC macro, 2012). According to EDHS (2011), the maternal mortality rate was estimated at 676 and fall to 412 by the 2016 EDHS analysis by CSA, which has shown a minimal change. One of the major explanations for the poor health outcomes among women and children is the nonuse of modern health care services proportional to Ethiopian women.

The Amhara national regional state has been targeting on reducing maternal deaths with a slogan "Mother should not die while giving life". From CSA analysis in 2010 in Amhara national regional State percentage of women receiving antenatal care from skilled provider, institutionally delivered in and assisted by skilled providers were reported to be 33.6percent, 10.2 percent and 10.1 percent respectively. Another study in Amhara region show that maternal health care service was very low being 31.5percent, 27.7 and 27.1 for ANC, skilled delivery and professionally assisted delivery respectively (Temesgen T, 2012).

Despite low utilization of health care services, there is a considerable variation across different demographic and socio-economic variables; as a result an attempt is made in this study to understand the factors that determine women's utilization of health care services in Andabet Woreda.

1.2 Statement of the problem

In developing countries risks of pregnancy rise up to 200 times higher than those of Europe and North America. Because of the fact that modern maternity care have been largely denied by the former nations , all except 1 percent of the annual more than half million maternal deaths occur in the developing world (WHO, UNICEF, World Bank 2012). Ethiopia is one of the world six most burden countries (India, Nigeria, Pakistan, Afghanistan and Democratic Republic of Congo) in which half of global maternal deaths occur (ORC macro,2012). In Ethiopia more than 80 percent of the population live in rural areas, from this section of the society about half of them are women .This significant level of rural women have not get enough consideration for their social wellbeing for several years . One of the major obstacles in rural areas is the minimal availability and accessibility of health facility, which brought about rural women's high vulnerability for different deadly health problems.

Studies in different parts of the world discovered the low utilization of maternal health care services (MHCS) is one of the major causes of maternal deaths and morbidity in developing countries (Overbrosc, 2002, UNFPA, 2005). In line with Anson's findings that MHCS is an outcome of socio-economic process; studies by Wolde Michael and Tenkorangin (2009); Temesgen, (2012); Ismael Amoatang&Ngake, (2014) have shown that socio economic and demographic factors are the main determinants of MHC service in developing countries. The data analyzed in the 2016 EDHS has shown that there is a steady decline in the MMR from 871 death per 100000 live births in 2000 to 673,676and 412deaths per 100,000live births for 2005 EDHS,2011 EDHS and 2016EDHS respectively.

Despite several interventions by the Amhara national regional state Woreda administration and Woreda health office to address problems of maternal health care services with the slogan "Mother should not die while giving life", MHC service utilization determinants are not well studied. Efforts had biased on construction and provision of services as a result we need to think beyond supply issues and demand side individual behaviors should be considered. Thus, the

purpose of the study was to identify the various factors that determine maternal health care services using data from the study area.

1.3 Objective of the Study

1.3.1 General Objective

The general objective of the research is to identify the major factors determining the utilization of maternal health care service in rural areas of Andabet Woreda.

In accordance with the stated general objective, the study addressed the following specific objectives:

- To determine the magnitude of antenatal care, professionally assisted delivery care and postnatal care service utilization in the study area.
- To analyze the dominant factors that influence the utilization of maternal health care

1.4 Research Questions

Having the above major and specific objectives, the study addressed the following questions

a. Given socio economic and demographic factors, what are the major determining factors affecting maternal health care service utilization in Andabet Woreda?

b. What is the magnitude of antenatal care, professionally assisted delivery care and postnatal care services utilization in the study area?

c. What is the extent of use of maternal health care service utilization in Andabet Woreda?

1.5 Significance of the Study

Understanding factors that hinder the utilization of MHCS in health facilities are important in order to encourage women to utilize the services. Plan for future efficient services that can help to reduce maternal deaths, improve the health and lives of all women before during and after

pregnancy in rural areas; develop appropriate community interventions to improve utilization of maternal care services; and design of maternal health campaign services in the studied area.

As far as this study identified the factors affecting utilization of rural MHCS utilization in Andabet Woreda, it contributes to better understanding of the factors that make women less attendance in ANC, PADC and PNC services. Similarly, the study brought up information on the coverage of MHCS in the study area. The generated information could be used as input in decision-making and actions would lead to controlling the determinant in utilization of MHCS. Controlled determinant in utilization of MHCS will subsequently, lead to increased utilization of MHCS by the pregnant women and mothers. This will contribute its part on reduction of maternal mortality in Andabet Woreda. Also at higher level, this study is instrumental in informing policymakers on providing specific local pictures as an important tool for any advanced and appropriate intervention aimed at improving the utilization of MHCS at rural areas. Findings of the research can also stimulate the interest of other researchers to investigate various aspects of problems which are not fully addressed by this particular study.

1.6 Scope of the Study and Limitation of the Study

This research is restricted to examining factors that affect the utilization of MHCservices with particular perspective to women of Andabet Woreda of the Amhara region located in North western Ethiopia taking 3kebeles of the studyWoreda. But socio-economic and demographic factors got particular emphasis in the study. The study might cover women (reproductive age of 15-49 years) who gave birth at least once in the last three years preceding the survey irrespective of the outcome of delivery. MHCS components such as Family Planning, Prevention of Mother-to-Child Transmission (PMTCT) during childbirth and Legal Abortion care services were not considered in the study. So attendance cards were used to get the real information, but in the absence of health documents the data collectors used to provide sufficient time in order to recall the events.

1.7 Organization of the Study

This study is organized into five chapters. The first chapter presents the introductory part of the study, which consists of background, the statement of the problem, objectives, research questions, significance, scope, limitation of the study, and organization of the thesis. The second Chapter provided an overview of the state of the existing literature. The third chapter discusses the methodological aspects of the paper. The two final chapters will discuss analysis findings conclusions and recommendations. References and annex are also attached.

CHAPTER TWO

RELATED LITERATURE REVIEW

This chapter presented previous literature on both theoretical and empirical findings relevant to the research topic and key for drawing conceptual frame works. The concepts, components, and international community intervention to improve the maternal health care services utilization and finally factors influencing MHCS discussed in this chapter.

2.1Theoretical Literature Review

2.1.1 The concept of Health and Maternal Health Care and Its service Delivery

Health is a component of human capital, which in some recent literature is referred to as health human capital to distinguish it from education human capital. The world health organization (WHO), the key United Nations (UNs) agency concerned with global health matters defined health as, "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity". Conceptually, to be healthy means more than not having disease or infirmity it is to be harmony with oneself and environment. Health human capital expected to have a positive correlation with other forms of human capital. Healthy individuals, for instance, are on average better nourished and better educated than individuals in poor health. Both health and education increase labor productivity .But the unique feature that differentiate health from education is that health by reducing the time spent in sickness, it increases the total amount of time available to produce money earnings and commodities, as well as the time available for leisure (Grossman, 1972).

In a more comprehensive way maternal health (MH) is a state of complete physical, mental and social well-being of the mother; it is a resource for everyday life of the mother (Family Care International, 1997). The World Health organization (WHO) defines the MH as the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality.

The goal of prenatal (ANC) care is to detect any potential complications of pregnancy early, to prevent them if possible, and to direct the woman to appropriate specialist medical services. Postnatal care issues include recovery from childbirth, concerns about newborn care, nutrition, breastfeeding, and family planning (WHO, 2008).

MHCS include the following, preconception care, Antenatal (ANC), Prevention of Mother to Child Transmission of HIV (PMTCT), safe delivery (intra-partum care); post -natal care (PNC) and emergency obstetric care/management of obstetric complications (Dyogo, 2011). Prenatal outcomes also provide a true reflection of maternal healthcare services, but this study does not investigate prenatal outcomes. Instead, this research mainly focuses on ANC, delivery service and PNC.

2.1.2 Antenatal Care

Antenatal care (ANC) is the health care of women throughout the course of pregnancy. It is considered as the primary health care that is given to pregnant mothers in order to have safe pregnancy and healthy baby. Because all pregnant women are at risk of developing complications and because many of these complications are unpredictable, it is important to ensure that all pregnant women have access to preventive interventions, early diagnosis and treatment for problems, and emergency care when needed (WHO, 2002).

It is a basic instrument to protect the mother and child life during pregnancy (its effect may extend in to long life of them). It is important in minimizing complications of pregnancy, labor, the post-partum and neonatal periods. Good prenatal care helps ensure the health of both the mother and the baby. It is part of the primary health care services for pregnant women and management of the fetus. The main purpose of ANC is to care for pregnant mothers and to have all births attended by trained health workers, and to identify pregnancies where risk is high and provide special care for the mother and the infant. There is a large body of evidence from routine statistics and special studies to suggest that women who have received prenatal care experience lower rates of maternal mortality (Mesfin, 2003).

World health organization recommends a minimum of four ANC visit is needed to accomplish the essential level of ANC for every pregnant woman based on the time references developed. Even if recent empirical evidence had shown that four visits suffice for uncomplicated pregnancies more visits are recommended in case of pregnancy complications (Dana, Noreen and German, 2003). Similarly, recent research indicates that a greater number of visits, though not beneficial for low risk pregnancies are recommended for women with higher risks of obstetric complications (Adamu, 2011). However, the capability of ANC in improving MH outcomes greatly reduced in the absence of a feasible health and referral system where women can receive emergency obstetric care when needed.

2.2.3 Professionally Assisted and Institutional Delivery

Professionally Assisted delivery care is a concept which encompasses the presence of health professionals during delivery and also an enabling environment where the equipment, drugs and other supplies required for effective and efficient management of obstetric complications are available (UNFPA, 2013). It is an accredited health professional-such as a midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. Traditional birth attendants (TBA) trained or not, are excluded from the category of skilled attendant at delivery. Skilled birth attendants (SBA) are trained to recognize the signs of complications early enough to intervene and manage the situation or make quick referrals to higher levels of care.

There are two aspects of the delivery services that are considered in this analysis-whether the delivery was at home or at a health care facility and whether a trained person was present to assist in the delivery. Social norms in rural areas are such that home delivery is preferred than institutional deliveries. This isn't problem by itself, if hygienic and appropriate delivery practices are used either by traditional helpers or by a professionally trained person who makes home visits for helping with the delivery (Kassu, 2012).

In developed countries and in many urban areas in developing countries, skilled care at delivery is usually provided in a health facility. However, births can take place in a range of appropriate places, from home to tertiary referral center, depending on availability of health professional.

Home delivery may be appropriate for a normal delivery, provided that the person attending the delivery is suitably trained and equipped and that referral to a higher level of care is an option (Population Council, 2010).

In many countries, deliveries occur at home attended by TBAs. Previously, there were extensive efforts and funds expended toward upgrading the skills of TBAs, but half following the introduction of professional midwifery care at birth, in the early 20th century, reduced safe maternal mortality. Improved access to hospitals after the Second World War further reduced maternal death rates, subsequently resulting in the impressive low levels currently recorded (Brouwere, et al, 1998). For this reason, the proportion of births attended by a skilled health professional is currently being used as one of the indicators for monitoring progress in the achievement of the MDG 5.

2.2. 4 Postnatal Care

Postnatal Care (PNC) is health care given to the mother and baby immediately after childbirth up to six weeks period. The postnatal period is critical to the health and survival of a mother and her newborn being the most vulnerable time for both is during the hours and days after birth. Lack of care in this time period may result in death or disability as well as missed opportunities to promote healthy behaviors, affecting women, newborns, and children. Every year in Africa, at least 125,000 women and 870,000 newborns die in the first week after birth, yet this is when coverage and programs are treatable. Through examination of the mother after childbirth, PNC can identify these conditions and any other life-threatening or devastating conditions that may require urgent medical attention.

A number of other significant services and information can be provided during PNC. These include family planning services where information about child spacing and techniques to avoid unwanted pregnancies can be given. Other services and information, such as maternal and child nutrition, immunization, hygiene and sanitation, prevention of infections including HIV and other Sexually Transmitted Infections can all be provided during PNC (USAID, 2009).

In general there is increasing emphasis placed on ensuring that women receive PNC within a few days of delivery for early diagnosis of postpartum complications. PNC also provides an

opportunity to counsel the new mother on family planning and on caring for herself and her newborn, as well as to assess the newborn for any problems.

2.3 Importance of Maternal Health Care Service

The MHCS utilized by women during their pregnancy; delivery and after delivery is important for the survival and well-being of both the mother and the child. Several empirical evidences indicate that MHCS is mandatory to reduce maternal mortality and morbidity directly through detection and treatment of pregnancy related illness or indirectly through detection of women increased risk complication of delivery and insuring that they delivered in a suitable equipped facility (Guillermo, et al, 1992). MH is important to communities, families and the nation due to its profound effects on the health of women, immediate survival of the newborn and long term well-being of children, particularly girls and the well-being of families.

Poor maternal health can adversely affect the economic prospects of the next generation. The most tremendous impacts occur when a woman or her baby dies in childbirth, but maternal ill-health can also affect her children's well-being and schooling. Many studies have investigated how the loss of a parent impacts human capital investments in children, and studies in low-income countries have generally found that orphans have worse health and less schooling than other children (Evans and Miguel, 2007). Particularly, the studies also find that the death of a mother tends to affect children more adversely than the death of a father (Case and Aldington, 2006).

Evidence suggests that children, even in wealthier countries, benefit greatly later in life if their mothers are well fed and receive adequate health care during pregnancy: benefits include their subsequent health and schooling (Koren and Jeni, 2012). Several scholars stated that economic development can contribute to better health – wealth brings better nutrition, and wealthier countries have greater capability to invest in medical care and public health measures. However, there are reasons to believe the relationship also runs in the other direction, i.e. health improvements can contribute to economic development (Sachs, 2001). Health improvement enhances productivity, improve development outcomes for future generations, and make institutions function better (World Bank, 2012).

Most importantly, studies indicate that women are important contributors to the global economy. Moreover, about 40% of the global labor force and more than 60% of workers in agriculture in sub-Saharan Africa are women (FAO, IFAD, and World Bank, 1997). Since they have a great role on the global economy, maternal death, of a woman in reproductive age, has a further impact by causing grave economic and social hardship for her family and community as well. So strengthening MHCS delivery is not an option, it is fundamental to create a better world to whole society Safe Motherhood Strategies were developed based on pregnancy, antenatal, delivery and the postpartum periods. The specific activities include the provision of antenatal care, skilled assistance for normal deliveries, appropriate referral for women with obstetric complications, postnatal care, family planning and other reproductive health services.

2.4 International Initiatives on the Improvement of Maternal Health Care Service

2.4.1 Global Safe Motherhood Initiative

The global Safe Motherhood Initiative (SMI) was launched at an international conference held in Nairobi, Kenya in 1987, which had been marked as the beginning of concerted international efforts to reduce maternal mortality. Since that time, reducing maternal mortality has continued to be the aim of many international health programs. Its aim was to draw attention to the dimensions and consequences of poor MH in developing countries, and to mobilize action to address high rates of death and disability caused by the complications of pregnancy and childbirth.

Safe Motherhood Strategies were developed based on pregnancy, antenatal, delivery and the postpartum periods. The specific activities include the provision of antenatal care, skilled assistance for normal deliveries, appropriate referral for women with obstetric complications, postnatal care, family planning and other reproductive health services.

Technically, a great deal has been learned about what strategies are (and are not) effective in reducing maternal mortality. With this initiative, the growing need for more emphasis on MHCS was being addressed as it called for global initiatives to intensify policy intervention for maternal mortality (Hogan et al, 2010). The focus on maternal mortality became an important issue in international aid and health services research during this decade (Brouwere, et al, 1998). In the

following years, the focus was placed on the theme reproductive health as international commitment continued to contribute to the reduction of maternal mortality.

A major factor that has been recognized as achievement was the incorporation of a human rights approach into the definition of Safe Motherhood following the agenda set at the International Conference on Population and Development (ICPD). By defining maternal death as social injustice, programs for "Safer Motherhood" are able to invoke a much broader range of political, social, and economic initiatives than was previously possible (UNFPA, 1997).

Since the mid-1980s, SafeMotherhoodImitative has achieved greater prominence on the international agenda, gaining substantially increased visibility, resources, and attention. Progress has been achieved on a number of key indicators, including the proportion of pregnant women receiving ANC and the proportion of births attended by a SBA. Since 1990, the proportion of women receiving antenatal care in developing countries has increased by 20%, and more than 50% of women received at least the four recommended antenatal visits. Between 1990 and 2003, the presence of a skilled attendant at delivery increased significantly, from 41% to 57 % in the developing world as a whole (UNFPA, 2005).

Despite the widespread global commitment to reduce maternal mortality to lack of progress in achieving the goals of the SMI is multifaceted and can be attributed to many factors ranging from misconceptions and lack of political commitment, health system's general failure, inadequate investment in effective strategies, lack of clear technical priorities, subsequent implementation of poorly-focused and ineffective interventions and insufficient information (UNFPA, 2005).

Following the development of the Millennium Declaration the reduction of maternal mortality became not only a focus point to the international community but a high priority, strengthening the international commitment. On the other hand, the cause of maternal mortality was not reduced only targeting on the improvement of maternal health. The international community latter on understood the need of holistic approaches for world developmental problems. Currently, positive trends in the improvement of maternal health due to the influence of the Millennium Declaration can be noticed (Hogan, et al, 2010).

2.4.2 Millennium Development Goals /MDGs/ as A Framework for Global Strategies to Improve Maternal Health

When the new century began, the international community took a fresh look at its development agenda. This reassessment has been undertaken from a comprehensive perspective and is framed by the agreements reached at the global conferences on social issues. In September 2000, 189 heads of state adopted the UN Millennium Declaration and endorsed a framework for development. The plan was for countries and development partners to work together to increase access to the resources needed to reduce poverty and hunger, and tackle ill health, gender inequality, lack of education, lack of access to clean water and environmental degradation (UN, 2008; WHO, 2009).

The Millennium Declaration is the political manifestation of that commitment. The Declaration serves as the cornerstone for a development agenda founded upon values that will serve as a deep source of inspiration for international relations in the twenty-first century: freedom, equality, solidarity, tolerance, respect for nature and common but differentiated responsibilities. The multilateral agendas thus returned to a comprehensive approach to development with a view to ensuring universal respect not only for civil and political rights, but also for economic, social and cultural rights based on the belief that all human beings have the same rights, regardless of sex, skin color, language, culture or economic and social power (UNDP, 2005).

Health was at the heart of the MDGs. Goals 4, 5 and 6 specifically focus on health, but all the MDG have health-related aspects; achieving health goals will not be possible without progress on food security, gender equality, the empowerment of women, wider access to education and better stewardship of the environment (Haines, 2004; Wag staff *et* al, 2006; WHO, 2009). These goals aim to encourage development by improving social and economic conditions in the world's poorest countries. Under the United Nations, working on women's empowerment is expected to have a positive influence on decreasing the MMR. Because intra-partum and early postpartum strategies will not only improve maternal survival but will also have a positive influence on the survival of young children, MDG 4 is also strongly interlinked with reducing maternal deaths. Lastly, improving maternal health will also help the treatment and will reduce the spread of

infectious diseases as mothers and their baby will undergo medical check-ups that can address infections and possible transmissions of diseases.

In 2011, only 36 per cent of pregnant women in Southern Asia and 49 per cent in sub- Saharan Africa received at least four ANC visits during their latest pregnancy. Health Care can vary in terms of quality, a dimension that is hard to measure and is not reflected in the data. Monitoring is required to ensure high-quality antenatal care that actually contributes to improved pregnancy outcomes (UN, 2013). Mortality tends to be lower in countries where levels of contraceptive use and skilled attendance at birth were relatively high. With a contraceptive prevalence of only 25% and low levels of skilled attendance at birth, sub- Saharan Africa has the world's highest maternal mortality ratio. Education for girls is a key to reducing maternal mortality. The risk of maternal death is 2.7 times higher among women with no education and two times higher among women with one to six years of education than for women with more than 12 years of education (UN, 2013).

Ethiopia has one of the highest rates of maternal mortality in Africa. Progress on reducing maternal mortality has stalled since 2005 when the country managed to reduce maternal mortality rate (MMR) to 676 per 100,000 births in 2010/11 from 871 in 2000/01. This means that with the MDG target of 267 per 100,000 births by 2015, the country was clearly off-track on goal five. There are a number of factors behind this dismal performance namely; delays in seeking skilled emergency obstetric care; delays in reaching the health facility; and delays in receiving a timely intervention after reaching the facility and large proportions of unmet family planning needs among girls in child-decision-making should be addressed and effective community level actions implemented in order to accelerate progress on reducing maternal mortality in the remaining few years before 2015.

2.4.3 Sustainable Development Goals

The indicators for SDG targets 3.1 and 3.2 include the MDG indicators of maternal and under-five mortality in 2015, the maternal mortality ratio (MMR) – the number of maternal deaths per 100 000 live births – was estimated at 216 globally. Almost all of these deaths occurred in low-resource settings and could have been prevented. The global MMR declined by 44% during the

MDG era, representing an average annual reduction of 2.3% between1990 and 2015.2 In order to achieve the SDG target of 70 per 100 000 live births by 2030, the global annual rate of reduction will need to be at least 7.3%. Attaining that rate requires a marked acceleration in progress in this area. SDG Target 3.1 also includes skilled attendance at birth. Globally, coverage of skilled attendance at birth was estimated to have reached 73% in 2013. However, more than 40% of births in the WHO African Region and WHO South-East Asia Region were not attended by skilled health personnel, and within countries large access disparities associated with differences in socioeconomic status.

It also aims to achieve universal health coverage, and provide access to safe and effective medicines and vaccines for all. Supporting research and development for vaccines is an essential part of this process as well as expanding access to affordable medicines. Promoting health and well-being is one of 17 Global Goals that make up the 2030 Agenda for Sustainable Development. An integrated approach is crucial for progress across the multiple goals.

More specifically sustainable development goal 3 targeted to reduce global maternal mortality ratio to less than 70 percent per 100,000 in 2030.

2.5 Different Models Related to Maternal Health Care Service Utilization

Various conceptual or analytical models have been developed by different scholars to examine the barriers that deter women from seeking maternal health care services. These models have significant contribution to draw conceptual frame work and methodological aspects of the study. Some of these models are more instrumental to investigate this study, so they are discussed as follows:

The most known model is Andersen's behavioral model of health service utilization which is developed in 1968 and later on modified again to include some other factors. Anderson's modified behavioral model of health service obstetric care furthermore describes a broad set of factors such as increased awareness creation, demand for health care services and socio-

economic issues (including household decision-making) should be addressed and effective community level actions implemented in order to accelerate progress on reducing maternal mortality in the remaining few years before 2015.

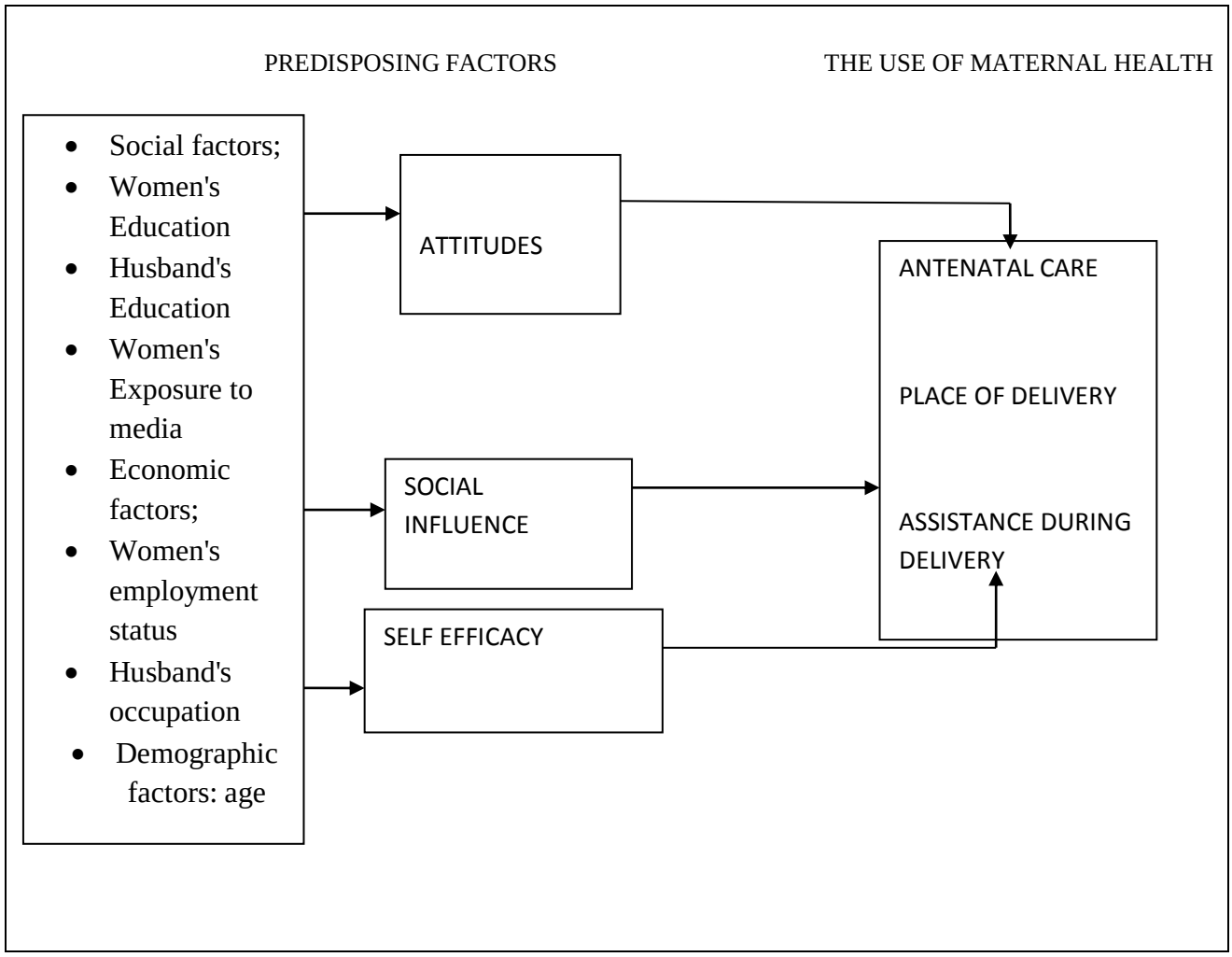
This model suggests that personal health practices and people's use of health services are functions of the following three categories:

a). **Predisposing characteristics**, factors that present preceding the ill health and need for care, such as demographic factors, social structures and health beliefs. Demographic factors such as age and gender represent biological urges the likelihood that people will need health services. Social structure is measured by a broad array of factors that determine the status a person in the community, his or her ability to cope with and command the resources to deal with these problems, and how healthy and unhealthy the physical environment is likely to be (education, occupation, ethnicity, etc.). Health beliefs are attitudes, values and knowledge that people have about health and health care services that might influence their subsequent perceptions of need and use of these services (Andersen, 1995).

b). **Enabling resources,** which provide patients with the means to make use of the services (Andersen 1995). These factors are seen as supporting resources, which may be resources from an individual, or those that exist at the community level. Such factors include income, having a health insurance, availability of health facilities and personnel and access to vehicles. For example, health personnel and facilities must be available and people must have the means and know how to get to those services and make use of them (Andersen 1995).

C) **Need**, which refers to health status, perceived by the individual or evaluated by the health providers (Andersen 1995). It is how people view their own general health and functional state, as well as how they experience the symptoms of illness, pain and worries about their health and whether or not they judge their problems to be of sufficient importance and magnitude to seek professional health care.

Figure2.1 conceptual frame work on Anderson model



Source: Adapted from Anderson, 1995; Kroeger, 1983; Amooti-Kaguna&Nwuaha, 2000

In addition, there is also a general model in the literature, which has been used in studies on determinants of utilization of health care services. It's usually called as "The Attitudes - Social influence - Self-efficacy (ASE)" model which designed to predict various health related behaviors. There are three main psychosocial factors, which have been identified that predict behavior intention: attitudes, social influences and self-efficacy. A person's attitude towards a specific behavior is a result from performing the behavior, for example a person's attitude in deciding whether to use family planning or traditional practices. Social influence is as a result of

social norms: influence from other peoples whether to perform or refrain from the specific behavior, and whether other people in society perform or refrain from doing specific behavior. Self-efficacy expectations can be seen as a person's belief whether she/he can perform the desired behavior and manage the barriers that may prevent him/her from doing specific behavior (Amooti and Nuwaha, 2000).

The implication of the model is that a person's health behavior can be changed by changing person's attitudes, person's perception of social norms and social support and her/his self-efficacy expectations (Amooti and Nuwaha 2000). Moreover, External variables, such as social, demographic and economic factors, are expected to influence behavior through behavioral determinants and intention.

In addition the above models, Thaddeus and Maine (1990) also categorized determining factors affecting the use of maternal health care service in to three broad classifications which are systemic factor, personal characteristic, geographic actors.

- Systemic factors are the first one which is related to health systems that include access, availability, cost of service, continuity/ interpretation of care, provider attitude/ integration etc.
- The second one is personal characteristics; it is more related with usage of health care service. These include the socio-demographic, social support, and attitudinal

Factors, knowledge and experience with event or system, perceived quality of care, etc.

- The final one is geographic actors which are related with the proximity of health care service provider. These factors are Urban/rural distribution, access, transportation, etc.

Despite some differences in their ways of expression and ranking issues all the above models share sorts of similarities in common.

2.2 Empirical findings

2.2.1 Factors Influencing Use of Maternal Healthcare Services

Based on the theoretical model above (Anderson behavioral model1995,Amooti and Nuwaha, 2000, The Attitudes - Social influence - Self-efficacy (ASE)), some of major determinants of MHCS utilization are discussed with their empirical findings. A particular emphasis is given for individual, areal, organizational, and socio-cultural factors in order to address the stated objective of the research.

Maternal mortality and morbidity, which is the result of low utilization of MHCS, are directly and indirectly related to societal, economical, institutional and cultural factors that impact women's health and their access to services. In India, a study of analysis of choice of delivery location showed that maternal and, partner education, and scheduled caste status were the predisposing factors that determined the choice of private facilities, public and home deliveries (Thindet al., 2008). In a similar way, a study from Pakistan showed that family size, parity, educational status, women autonomy and occupation of the head of the family were also associated with health seeking behavior in addition to age, gender and marital status (Babar, et al, 2004).

A study that conducted here in Ethiopia, women's autonomy, as measured by the extent of a women's freedom of movement, appears to be a major determinant of maternal health care utilization among the poor to middle income women (Woldemicael and Tenkorang, 2010).

The age of the individual is also supposed to affect health service utilization. Since older and younger women have different experience and influence, their behavior on seeking health care are also vary. Commonly, younger women are more likely to utilize modern health care facilities than older women, as they are likely to have greater exposure and knowledge to modern health care, also more access to education. This has been understood on study of Ethiopia, use of antenatal care is about 28% for women under the age of 35, while it is 21% for those over the age of 35 years. Furthermore, about twice as many women age 15-19 received delivery care from a health professional than women age 20 and above (Yared and Asnakechi, 2002).

Another factor is marital status, there is assumption that Single (unmarried) mother could feel stigmatized or discriminated against by health workers or other peoples at health setting. Therefore, they could choose not to have antenatal care and not to deliver at home to avoid embarrassing situations. However according to study done in Ethiopia, unmarried women are more than twice as likely as married women to receive delivery assistance from a health professional. In contrary married women are 40% more likely to receive antenatal care from a health professional than unmarried women (Yared and Asnakechi, 2002).

One study in Turkey (Celik& Hotchkiss 2000) showed that women who delivered their first child were found to be significantly more likely to use prenatal care and trained assistance during the birth delivery than women in the higher order.

Amongst the individual maternal characteristics, education of women has been found to have the strongest association with the use of maternal health care services.. Women with higher education attainment levels were found to be significantly more likely to choose a health facility delivery than traditional home delivery and also a modern home delivery than traditional home delivery (Yusuf and David, 2000). Similarly, in Thailand, one analysis showed that maternal education exerts a significant influence on the use of maternal health care services; the odds of using prenatal care and formal delivery assistance is much greater for women with primary schooling, compared to women with zero years of schooling (Raghupathy,1996). Educated mothers are considered to have a greater awareness of the existence of maternal health care services and benefited in using such services.

Moreover, several studies indicate that women's personal income and her partner income (house hold income) has a great impact on determining the utilization of MHCS. The costs of seeking healthcare may include costs for transportation, user fees (official and/or unofficial), medications and other supplies. Women from poor families or those with limited financial resources may have difficulty paying for such costs and are likely to be deterred from using MHCS (Gabrysch& Campbell, 2009). In a study on the determinants of MHCS in the rural India, it was found that, there is a correlation between household income and utilization of MHCS (Sharif and Singh,

2002). It was evident that as a result of lack of productive resources for women, income earned by women had negative impact on utilization of ANC and PNC.

Similarly, media has a great contribution on disseminating health related information; in line with this it plays great role on the improvement of health outcome. The study which has been done in India indicate that women with high degree of exposure to mass media were more likely to have utilized antenatal check-up and institutional delivery service than those who had less or no exposure in most states of southern India (Navaneetham and Dharma lingam, 2002). Moreover, a study by Obermeyer (1993) in Morocco and Tunisia indicated that watching television weekly is associated with an increase in the likelihood of both prenatal care and hospital delivery.

Unreliable transport is also a barrier to access skilled delivery in rural areas, failure to plan in advance for transport cause higher number of women to deliver in their homes even if they had planned to deliver in health facilities (Mrisho et al, 2007; Magoma, 2010). Similar findings have been documented by study done at Nepal where by women who planned to deliver in health facilities 18% delivered in home due to lack of transport (Bolam et al, 1998). In a rural Tanzania for instance 84% of woman who give birth at homes are intended to deliver in health facility but due to transport problem and long distance to health facilities they end up delivering home (Bicego, et al 1995).

Inadequate knowledge and skills for health workers on management of obstetrics cases can be the barrier for delivery in health facilities thus woman will never come back to that facility due to unnecessary referral to other health facility (Shankwaya, 2008). A study from South India showed that assistance during delivery can reduce the risk of obstructed labor and it is highly associated with the place of delivery (Navaneetham, et al, 2002). Another study also presented the role of assisted SBAs in preventing direct and indirect cause of maternal deaths such as, infection, shock, blood loss, convulsions, and surgical procedures, such as caesarean delivery (AbouZahr, 2003).

Health provider behavior and attitudes are also determinant factor for a choice of place of delivery for pregnant mother, some of the health workers are using abusive language and refusing to assist the patients, these attitudes prevent the women to deliver in health facilities however positives attitudes of health workers attract women to deliver in health facilities (Mrisho et al, 2008). This encourages the women to deliver in health facilities.

In summary, the above studies have identified that the main determinants for low utilization of MHCS include maternal education, gender of the household head, mother's education, mother's age at child birth, socio-economic status, birth order, decision making power accessibility and quality of health service, cultural belief and areal factors like nature of the road, access and cost of transportation.

Utilization of maternal health care service is an outcome of socioeconomic process in which both social characteristics of an individual such as social class, and structural characteristics, such as the availability and accessibility of health services play a role. In line with Anson's findings Studies by (Woldemicael and Tenkorang, 2009);(Temesgen, 2012);(Ismael Amoatang&Ngake, 2014) have shown that socio economic and demographic factors are the main determinants of MHC service in developing countries. While behavioral, areal and supply side reasons were found dominant in a study in Southern Ethiopia by (AmbayichewZ 2015).

Finally the lessons the researcher got from the empirical findings of previous studies include it is widely agreed that maternal health is key global problem and low level of MHC service is the source of the problem. Secondly , both demand side and supply factors highly determine MHCs utilization, but still there are no common agreements by different researchers and in different areas.

Demographic factors such as age of the mother; birth order ; socio cultural determinants like education of the mothers and partners health seeking behavior and economic factors basically income were considered in studies by UNFPA (2008& 2011); Regasa (2011), Nigeria 2012 Contrary to these findings a study by Assimwe in Uganda in 2012 observed that maternal health care utilization is a function of affordability rather than demographic factors example age, while Heidi etal in the same country in2006 found no significant difference between young and old mothers with regard to seeking antenatal and delivery health care services.

Regarding the economic determinant, income and that of education related studies approved both variables have pivotal role in MHC service utilization. And finally, little has done on women health seeking behavior determinants, socio cultural aspects and community level local institutional issues (networks). Despite some differences in their ways of expression and ranking issues all the above models share sorts of similarities in common. And methodologically the use of the general (national) statistical data by most researches restricts its applicability to some rural areas with their own unique characteristics.

CHAPTER THREE

METHODOLOGY

In this chapter the research methodology; theoretical framework and the reasons for choosing this methodology and its suitability to the research are discussed. Besides this description of the selected study area, the study population and sampling, data analysis and research methods are presented.

3.1 Description of the Selected Study Area

The study was undertaken in Andabet Woreda which is located in Amhara National Regional State in the northern part of Ethiopia .The Woreda is about a distance of 150 km from the regional capital Bahirdar city in the North West and 90 km in South west from Zonal Town, Debretabor. It is one of the 13 rural Woredas in the zone. It was organized as a newly established Woreda in 2006 and Andabet become the Centre of the Woreda. It comprises 21 rural kebeles and Jaragedo and Wolesh municipality city administrations. It shares boundaries with Estie Woreda in the North, Dera Woreda in the South and in the North West and west Gojjam Zone in the North East.

The total area of the Woreda is approximately82449.8 hectare with altitude ranging from 1500 to 3000 meters above sea level. The Woreda is 91%Woina-dega, 6% Kola and 3% Dega. The raining season is from May up to September/ October with an average annual rain fall ranging from 1300 to 1500 mm with the economic activities largely dominated by subsistence traditional agriculture.TheWoreda has a total population of 142,916 with 72,701 (50.8%) male and 70215(49.2%) women .Out of this total population the vast majority 135,934(95%) is rural resident and the rest 6982 (5%) is urban dweller. The average family size of the households is five, and total households are 31250. About 99.9 of the total population of the Woreda belongs the same ethnic Amhara (AndabetWoredaStatistical Abstract, 2011).

The majority (95%) of the people in the Woreda mainly depend on mixed agriculture (both crop and livestock productions) with traditional farming system economy similar to the other rural

areas of the country. Next to agriculture, petty trade is also a common income source for the people in the Woreda. In terms of infrastructure, it has one paved road, which connects the Woreda town of Andabet with the Zonal town of Debretabor. The Woreda center has got hydro-electric power service and pure water supply.

According to the information from the Woreda Health office, the health services coverage of the Woreda is 69%. MHCS is delivered in 24 health posts /Tena kelas/ and five health centers which all belong to the public health system. This Woreda is known by its remoteness and characterized by its less developed health sector and difficult topography. Although the government effort made to improve the health facility of the Woreda it is very yet to achieve the standard level which do WHO and Ministry of Health (MOH) state. The following ratios are important to show the inadequate health service of the Woreda.

Table3.1: The ratio of Health Professionals to population in Andabet Woreda, 2015.

Types of Ratios	Ratio of Health professionals to Population	Standard Level of WHO and MOH
Health Extension workers	1: 2777	1:2,500
Health professional Population Ratio	1:13,557	1:10,000

N.B: No Medical doctor available in the Woreda

Source; Andabet Woreda health office 2015/16

Similarly the inadequate number of health institutions might limit the Woreda health coverage only at 69%. This can be also described based on the ratio of health institution and population as well. In the Woreda no hospital is available and as a result the people have to go to the Zonal capital Debretabor which is more than 92kms from the Woreda capital and beyond this for the hinterland kebeles.

Table 3.2 the ratio of health institutions and population in Andabet Woreda, 2015.

Types of ratio	Ratio of health professional to population	Standard level of WHO and MOH
Health center	1:28583	1:25,000
Health post	1:5000	1:2,500

Source Andabet Woreda health office 2015\16

3.2 Research Method

A descriptive cross sectional household survey was adopted in the study. The study employed quantitative research approaches to examine the determinants of the utilization of maternal health care services in Andabet Woreda. The design is chosen because cross-sectional study is appropriate since it involved the measure of many different maternity aspects at different ages, collected over a short period of time. This design is relatively quick, cheap, and easy to carry out, and results are easy to analyze (Kirkwood, 1988, cited in Abay.Z, 2015).

3.3 The Study Population

Women, who give birth at least once in the last three years before the survey, were considered in the study irrespective of delivery outcome and who are permanent residents of the study area. If women had more than one live birth in the past three years, only care received for the most recent birth is considered.

3.4 Sampling techniques of the Study

A stratified sampling technique is employed to select a total of 3 kebeles out of 23kebeles in the Woreda based on their distance to health institution at the Woreda center which is relatively well organized in service provisions. 9 kebeles were remote, 8 kebeles moderate and 6 kebeles were stratified as near to health institution kebeles. Shime kebele from the near health institution kebeles, Muger from moderate distance kebeles and Wofchame from Very far to health institution kebeles were selected. The sample frame was drawn from these three selected

kebeles-taking women who give birth at least once in the last three years before the survey to and randomly selected irrespective of their follow-ups in the selected outcome variables.

3.5 The Sample size

The sample size was determined by using the formula of Kothari, 2004.The calculation was made using the formula for sample proportions with 95% confidence level.

$$n = \frac{z^2 pqN}{e^2(N-1) + Z^2 pq}$$

Having 1080 target population elements and then using a sample size formula for finite population the sample size is adjusted as**265**women.

Table3.3 proportional sampling for selected kebeles

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Total population in the sample frame	Sample kebeles population		Sample kebeles proportion from the sample(265)	
1080	Keble	Population	Kebele	Sample proportion
	Shime	390	Shime	$^{390}/_{1080} = 0.36, 265 \times 0.36 = 95$
	Muger	330	Muger	$^{330}/_{1080} = 0.31, 265 \times 0.31 = 83$
	Wofchame	360	Wofchame	$360/1080 = 0.33, 265 \times 0.33 = 87$

Source; Own computation, 2017

3.6 Data Collection Process

3.6.1 Sources and Types of Data

For undertaking this research, the researcher has mostly relied on primary sources of data. Accordingly, all the necessary primary data were collected from selected eligible women. With regard to types of data, quantitative data was collected through administering structured questionnaire.

3.6.2 Data Collection techniques

In this study, the researcher-collected data mainly on structured questionnaires through door-to-door interviewing the eligible respondents by enumerators who completed 10th grade and above and who fluently speak the local language of the study area. Three health worker supervisors were selected to supervise the data collection process and perform quality checks.

3.6.3 Pre-Testing of Data Collection Instruments

The structured questionnaire was pre-tested on 3% of the total sample size (8questionniers)in one of non-selected kebeles (Gono Kebele) of the studied Woreda. After the pre-testing, problems such as ambiguity and incompleteness associated with the questionnaire were modified without changing the meaning.

3.8 Variables in the Research

3.8. 1Outcome Variable

The following three outcome variables would be studied in the analysis

- **Use of ANC service**: A woman is considered for having used ANC service if she is checked by a health professional (doctor, nurse or midwife) during her pregnancy .This variable will take a value of one if the woman received care from a health professional and 0 otherwise.
- **Place of delivery**: This variable will take a value of 1 if the woman delivered in hospitals, clinics, health centers, and health posts (HP) and maternity homes and 0 otherwise.

- **Postnatal Assistance**: defined as whether the woman received assistance from a certified health professional (doctor nurse or mid wife). This variable will take a value of 1 if the woman received assistance from a health professional and coded as 0 otherwise.

3.8.2 Independent variables

Several socio-economic and demographic variables are considered to investigate their effects on use of maternal health services. These variables are described in the table as follows;

Table 3.4 description of independent variables

Variable	Measurement
Place of residence	This is a dichotomous variable for women residence 1 for near institutions and 0 to far to institutions to where the woman is living in the time of the survey.
Age squared (respondent)	This variable refers to age of the woman at the time of the survey and has three categories ranging from 15-49 and is categorized as 15-19,20-34, and 35-49
Educational status	Educational status refers to the highest educational level the woman attained and it w categorized in to four groups as no education, primary, secondary and secondary plus a higher.
Occupation of the partner	Fall in to two categories of skilled or not skilled .Partners who never working who were working in agriculture and un skilled manual work classified as not skilled and those working clerical , sales, services and skilled manual work classified as skilled workers.
Wealth index	To be measured by a composite score of several indicator of households possession. Calculated according to the questions about whether the household has items and facilities as materials of home, , toilet, and type of floor, electricity, radio, television and social status like education. Then according to the answer, each asset was given weight. Each household then was assigned a score according to each asset and the scores were assumed for each household. The higher the score the higher is the economic status of the house hold.
Birth order	This is the rank of the child at birth, which had three categories starting from 1-2, 3-4and above 5 .for instances 1 refers to the first born child.
Women's exposure to media	This refers to women's exposure to information through the radio, television and newspapers.
Women net work	Women membership in institution at village level 1for members 0for non members
Membership in CBH insurance	A dichotomous variable coded as 1 for insured women and 0 for non insured women

These categories of the independent variables were coded starting from zero to make it appropriate for further analysis using logistic regression methods.

3.8.3 Methods of Data Analysis

3.8.3.1 Descriptive analysis

Descriptive statistics of frequency and percentage was used to describe the data and to analyze the level of maternal health care services and reasons for the non-utilization of maternal health care services in the study area.

3.8.3.2Econometrics model

Given the nature of the questions in the survey, binary logistic regression with other statistical techniques is used. The techniques employed for the study are determined by the relevant question posed in the survey. Finally, the data analysis was done by STATA version 12 software packages.

So as to estimate the effect of individual characteristics on maternal health service utilization, three dependent variables were considered in the study. These are antenatal care, place of delivery and postnatal care. All of these variables had binary response (dichotomous). Three different logistic regression models were estimated for the three dependent variables. The logistic regression model provides an opportunity to estimate the probability of health service utilization depending on the independent variables included in the model.

According to (Wooldridge 2009;431) a model for binary response where the response probability is the logic function is evaluated as a linear function of the explanatory variable taking only two values o and1.

The logistic regression model for each of the three dependent variables and for ***I*** independent variable (X1, X2, X3…., Xi) is given as:

$\rho i = E(y = 1/xi) = \alpha + \beta 1x1 + \cdots \beta ixi$ ..... *(1)*

$\rho i = \in (y = 1/xi) = \frac{1}{1+e^{-(\alpha+\beta 1x1+\cdots \beta ixi}}$ ---------- *(2)*

$\rho i = \frac{1}{1+e-zi} = \frac{e^z}{1+e^z}$ 3

Where, Zi = $\alpha + \beta 1x1 + \cdots . \beta ixi$

If Pi = the probability of using maternal health care services, is given by (3) then (1-p) is the probability of not using the maternal health care service.

$(1 - pi) = \frac{1}{1+e^{zi}}$..... *(4)*

Therefore we can write $\frac{p}{1-pi} = \frac{1+e^{zi}}{1+e^{-zi}} = e^{zi}$ ..... *(5)*

Now Pi / (1-Pi) are simply the odds ratio in favor of using maternal health care service or the ratio of probability that a woman will use maternal health care service to the probability that it will not use the service.

If we take the natural logarithm of (5)we get very interesting result, namely

$Li = \ln\left(\frac{pi}{1-pi}\right) = Zi = \alpha + \beta 1x1 + \cdots \beta ixi$

ln L=x'β.....(6)

That is, L, the log of the odds ratio.

The marginal effects are given by:

$\frac{\partial E(y/x)}{\partial x} = \left(\frac{d \wedge (x'\beta)}{d(x'\beta)}\right)\beta$

But $\frac{d \wedge (x'\beta)}{d(x'\beta)} = \frac{e^{x'\beta}}{(1+e^{x'\beta})2} = \wedge(x'\beta)\,[1 - \wedge(x'\beta)]$

Thus, $\frac{\partial E(y/x)}{\partial x} = \wedge(x'\beta)\,[1 - \wedge(x'\beta)]$.....7

Where, $\beta = regression\ coefficient\ \alpha = constant$

x= independent variable and

Different logistic regression models are fitted for each of the dependent variables; for antenatal care, delivery care and skilled birth attendant are fitted as follows.

$$A = \alpha o + \alpha 1x1 + a2x2 + a3x3 + a4x4 + a5x5 + a6x6 + a7X7 + a8x8 + a9x9 + \boldsymbol{\varepsilon 0}$$

$$B = \beta o + \beta 1x1 + \beta 2x2 + \beta 3x3 + \beta 4x4 + \beta 5x5 + \beta 6x6 + \beta 7X7 + \beta 8x8 + \beta 9x9 + \boldsymbol{\varepsilon 1}$$

$$P = \delta o + \delta 1x1 + \delta 2x2 + \delta 3x3 + \delta 4x4 + \delta 5x5 + 6\delta x6 + \delta 7X7 + \delta 8x8 + \delta 9x9 + \boldsymbol{\varepsilon 2}$$

Where yi is the dependent variable maternal health care utilization; A is demand for antenatal care =1 if a woman attended antenatal care 0 if otherwise. B is demand for delivery care =1 if a woman attended delivery care and 0 if otherwise .C is demand for postnatal care =1if a woman received post natal care0 if otherwise.

Xi is a vector of independent variables such as maternal education, income, place of residence, age of the mother, husband occupation, community based health insurance, exposure to media etc.

α, **β**and **δ** are vectors of the parameters to be estimated,

ε is the error term

The error term is assumed to have a logistic distribution which leads to a binary logit model. We can define the binary response model (Greene 2002) by transforming yi=xiβ into a probability such that;

Prob (yi=1) =F(X,β)……..(8)

The estimation of the model is by maximum likelihood technique .The logistic regression is however sensitive to extremely high correlation among the independent variables (multicollinearity). This problem of multicollinearity was examined using the tolerance and the variance inflation factor (VIF).Correlation analysis was undertaken to investigate biasness suspected among the key variables in the study as shown in annex which give detail of the existing correlation.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

This chapter covers the findings and discussions on the main factors determining the utilization of maternal health care services in Andabet Woreda. Binary logit regression model has been employed in establishing the relationship. Both descriptive and inferential statistics with econometrics estimation are presented.

4.1 Level of maternal health care utilization in Andabet Woreda

From the study results about 59 percent of respondents attended or received antenatal care. This implied that about 41 percent of mothers had no antenatal care visits. The variation from the average was about 49 percent. About 63 percent of women used institutional delivery which is lower compared to those who have had required visits. Postnatal care was reported to be attended by less than half of the respondents (41percent). This result approved that the postnatal care visit is much lower than even below the antenatal care and institutional delivery services.

Most mothers aged about 20-34 years average with the youngest being in the 15-19 years and the oldest in the 35-49 age categories. On maternal education the study revealed that about 52 percent of mothers had no education at all while 10 percent had primary level education and the remaining 38 percent had secondary and above .

Birth order of child was examined and found that most children were of the second birth order (3-4) that comprise of about 38 percent of births, 32 percent of births in the third order and 30 percent in the first order of births .The study also indicated that 64 percent of the respondents were from remote rural areas and the remaining 36 percent reside near health institutions or urban areas. Majority of respondents were in the middle, poor and rich wealth quintiles with a percentage share of 27 percent, 22 percent and 21 percent.

Table4.1 summary statistics for the dependent and independent variables

Variable	Obs	Percentage	Std. Dev.	Min	Max
Antenatal care	265	.596	.4915815	0	4
Delivery	265	.638	.4815641	0	1
Postnatal care	265	.419	.4943072	0	1
Age 15-19	265	.234	.4241495	-	-
Age 20-34	265	.509	.5008569	-	-
Age 35-49	265	.257	.4375852	-	-
Birth order 1-2	265	.302	.4599451	1	2
Birth order 3-4	265	.381	.4865839	3	4
Birth order >5	265	.317	.4661804	-	-
Moth no educ.	265	.525	.5003429	-	-
Moth educ 1-8	265	.102	.3030718	-	-
Moth educ sec	265	.374	.4846707	-	-
Moth educ>secondary	265	.332	.471849	-	-
Poor	265	.275	.447597	0.60	1.95
Middle	265	.226	.4193027	1.20	3.15
Rich	265	.219	.4142612	3.20	5.70
Richest	265	.155	.3623189	5.70	15
Partner occup.	265	.558	.505063	-	-
Distance to institutions	265	1.79	1.103657	.1	5

The study also indicated the respondent's membership in community based health insurance scheme only for rural women was about 27 percent of the respondents reported as they were

insured and the mass majorities (more than 73 percent) were not insured. Out of the total respondents, more than half of them reported as they were not exposed to mass media.

Respondents were also requested to put their reasons for low level of utilization of maternal health care services. And it was found that 10.9 percent of the respondents reported that their reason for not utilizing ANC was long distance from home to health institution, 8.3 percent work load, 7.8 financial problem,6.71 percent of the respondents said they don't know the importance, 4.9 percent of partners refusal and about 2% reported because they felt they were healthy.

From the reasons given for low level of institutional delivery, about 16.2 percent of the respondents reported transport problem , too early labor and work load, long distance from home to health institution, disliking professionals behavior, no problem experienced in the previous births, traditional birth attendants and family pressure, I do not know the benefit of institutional delivery account 5.28 percent, 6.04 percent, 4.15 percent,3 percent,2.6 and 1.13 percent, respectively. Among the reasons respondents reported for low level of utilizing postnatal care service, I was healthy, long distance to health institution, I do not understand the importance of PNC, disliking the behavior of professionals and negative attitude about PNC account 18.1percent, 17.4 percent, 16.9 percent, 3.4 percent and 3.02 percent respectively.

4.2 Econometric Estimation: Determinants of maternal health care utilization

To explore and understand the major determinants of maternal health care services utilization, both the demographic and socio- economic factors that significantly influence the service utilization, the study conducted three logistic regression models. Table 4.2 show factors influencing usage of antenatal care. From the table a p value less than 5% imply that the variables considered fit the model well thus the variables used in the model were significant in explaining how antenatal care affects maternal health care services in Andabet Woreda. The pseudo R was about 66percent.

From the results of the model age of the mother, primary, secondary and more than secondary education level of the mother, household head occupation, community insurance membership residence and the middle, rich and richest wealth quintiles were statistically significant for the

outcome variable antenatal care. While the highest all birth order, exposure to media, and the poor wealth quintile were found to be statistically insignificant at all significant levels.

Age of the respondent has shown a negative significant relationship with antenatal care. The regression model shows that women in the age category 20-34 had on average 19 percent lower use of antenatal care services and women above 35 years of age had 20 percentage point lower use of antenatal care service compared to women in the youngest age group other things held constant.

Mother's education level is highly significant factor that indicated a positive relationship with antenatal care. Being primary educated increased the probability of utilization of antenatal care on average by 24 percent and secondary and more than secondary education led to an increase on the probability of antenatal care service utilization on average by 94 and 24 percent respectively other factors held constant. Having membership in community based health insurance scheme in rural areas rises the probability of antenatal care service utilization on average by 4 percent. When we look the wealth side, it was found that being in the middle, richer and richest wealth quintile increases the probability of antenatal care usage by a mother on average by 7 percent 10 percent and 5 percent respectively other factors held constant. For women who reside far to health institutions the probability of attending antenatal care reduced by more than 90 percent compared to mothers who reside around health institutions other things held constant.

Table4.2 marginal effect after logit, use of antenatal care service

Variable	Coefficient.	Marginal effect	Significance value(Z)
Ageofthemother20-34	-3.590	-.198	3.07**
Ageofthemother35-49	-2.557	-.206	2.48**
Birth order(3-4)	1.232	.0459	1.11
Birth order(>5)	-.837	-.039	1.17
Mother educ 1-8	19.388	.242	3.19**
Mother educ.secondary	15.904	.944	24.87***
Mother edu. above secondary	6.002	.244	2.91**
Exposure to media	.680	.028	1.03
Community based h.insurance	1.230	.040	1.61*
Local network membership	.976	.052	1.59
Poor	1.256	.041	1.48
Middle	2.790	.072	2.23**
Rich	4.578	.107	2.49**
Richest	2.587	.057	2.29**
Distance to institutions	-18.748	-0.99	41.59***
Occupation of hhhead	.661	.027	1.41

Number of obs = 265

Wald chi2(16) = 419.59

Prob> chi2 = 0.0000

Log likelihood = -59.490574 Pseudo R2 = 0.6672

***p<0.10, **p<0.05,*p<0.01

Table 4.3below shows a p value of less than 5% and 10% indicating that the variables used in the model were significant in explaining how institutional delivery affects maternal health care service in Andabet Woreda .The pseudo (28%) was very low. From the results of the model primary and above secondary education, the rich and richest wealth quintiles and house hold head occupation were found statistically significant. But age of the mother, birth order, access to mass media and secondary education were insignificant in estimating institutional delivery.

Having primary education increases a mother probability of institutional delivery by 26.7 percent while more than secondary education increases this probability of institutional delivery by 30 percent on average other factors held constant. In case of wealth quintile being in middle and rich wealth categories raises the probability of mothers' institutional delivery by 18.5 and 37.3percents on average respectively other things held constant. Mothers with house hold head in skilled work had on average a10 percent more probability of experiansing institutional delivery compared to women with house hold head in the non skilled sector other factors held constant.

Table4.3marginal effect after logit, use of delivery care service

Variable	Coef.	Marginal effect	Significance value(Z)
Ageofthemother20-34	.155	.030	0.32
Ageofthemother35-49	-.259	-.052	0.53
Birth order(3-4)	-.458	-.092	0.84
Birth order(>5)	-.324	-.065	0.72
Mother educ 1-8	2.212	.267	5.37***
Mother educ.secondary	.804	.150	1.07
Mother edu. above secondary	1.804	.302	2.88**
Exposure to media	-.181	-.037	0.41
Community based h.insurance	.553	.102	1.26
Local network membership	-.482	-.089	1.24
Poor	-.148	-.029	0.32
Middle	1.105	.185	2.54**
Rich	2.905	.374	6.48***
Richest	.532	.095	1.15
Distance to institutions	-1.079	-.224	1.50
Occupation of hhhead	.557	.109	1.72***

Number of obs 265

Wald chi2(16) 56.40

Prob> chi2 = 0.0000

Log likelihood = -123.78938 Pseudo R2 = 0.2865

***p<0.10, **p<0.05, *p<0.01

From table 4.4 we can understand that age of the mother in the age category of 35-49, birth order of more than 5 children, primary education, middle and rich wealth quintile ,community based health insurance and residence were significant. However, age of the mother in the 20-35 categories, secondary and above secondary education level, local network, exposure to media and the poor wealth quintile were statistically insignificant.

Among the significant variables for postnatal care mother education was strong and positive significant which implies educated mothers are more likely to utilize postnatal care services than non educated mothers. Having primary, secondary and above secondary education increases on average the probability of a mother to attain postnatal care services by 65 percent, 46 percent and 29 percent respectively other factors held constant.

Similarly, community based health insurance affect postnatal care service utilization strong positively. Being insured increases the probability of postnatal care utilization by 25 percent other factors remained unchanged. The middle wealth quintile and the rich wealth have significant effect on postnatal care service utilization as this service increases on average by 29 percent and 30 percent, respectively other factors health constant. Residence has a negative significant effect as the probability of utilizing postnatal care for women in distant areas on average decreased by 36 percent as compared to women around health institutions other things held constant.

Table4.4. marginal effect after logit, use of postnatal care service

Variable	Coef.	Marginal effect	Significance value(Z)
Ageofthemother20-34	.828	.195	1.52
Ageofthemother35-49	1.613	.384	3.32**
Birth order(3-4)	.256	.062	0.50
Birth order(>5)	-1.081	-.244	2.47**
Mother educ 1-8	4.180	.659	14.82***
Mother educ.secondary	2.006	.462	2.95**
Mother edu. above secondary	1.239	.298	2.10**
Exposure to media	-.511	-.123	1.01
Community based h.insurance	1.047	.254	2.34**
Local network membership	-.541	-.133	1.10
Poor	.453	.110	0.78
Middle	1.220	.296	2.07**
Rich	1.281	.309	2.07**
Richest	1.021	.249	1.55
Distance to institutions	.652	-.365	2.88**
Occupation of hhhead	.069	.017	0.21

Number of obs = 265

Wald chi2 (16) = 79.88

Prob> chi2 = 0.0000

Log likelihood = -125.31903 Pseudo R2 = 0.3045

***p<o.10, **p<0.05,*p<0.01

Education was discovered to have a positive impact on utilization of maternal healthcare services in Andabet Woreda . These significant relations increased the probability of utilizing maternal healthcare services in the study area. This is in line with researches by Temesgen(2012) and AmbayichewZ.(2015) who established that higher levels of education that is literacy, positively influences utilization of maternal healthcare services in Amhara region and Southern Nations Nationalities and peoples Region. Also a study conducted by Machio (2008) in Kenya, indicated that education on the women and the husbands increases demand for postnatal care, hospital delivery and antenatal care. Becker et al., 1993

found out that mother's education is the most consistent and important determinant of the use of child and maternal health services. This result implies that educated mother makes rational decision regarding utilization of any antenatal care, hospital delivery and postnatal care.

The study finding indicates that age of the mother significantly led to increase in the use of postnatal services. As indicated by (Rahman, 2009) older mothers, demand for postnatal care, which is because of complications that older mothers might have gone through in earlier, births (Begun et al, 2010). Further, (Fiedler, 1981; Elo, 1992; Fosu, 1994) established that women's current age is important in utilization of medical services.

Birth order was found to have negative influence on maternal health care service outcome postnatal care. This corresponds with studies by (Wong et.al., 1987; Elo, 1992, Celik&Hotchkiss, 2000). Having more children causes resource constraints, which negatively affect healthcare utilization. The authors established that a woman is more likely to seek maternal healthcare services at first birth than subsequent births. Further, (Shariff and Singh 2002) determined that as the number of children a mother has increases, the need to utilize healthcare services tends to fall.

Generally, despite low utilization maternal health care service and considerable variation across demographic and socio economic variables improvement has been registered in Andabet Woreda(59% for ANC, 63% for delivery and 41 % for PNC) in 2015/16 even as compared to Amhara national regional state average(31.5% for ANC, 27.7%for delivery and 27.1 % for PNC) in 2012(TemesgenT.,2012).

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this study demonstrates that the utilization of maternal health care services is inadequate in Andabet Woreda, as clearly depicted by the major maternal health care indicators (antenatal 61percent, delivery 59percent, and postnatal care service very low at 41percent). The situation is worst in the rural and remote kebeles to health institutions. The most common deterring factors were socio economic and demographic ones. The administration and stake holders need to consider factors which lead to better utilization of antenatal care such as education of the mother, age category , wealth index, birth order, community based health insurance scheme. Delivery service need considering factors like age, education levels, birth order, wealth index and the postnatal care services include considering age and birth order, education levels, wealth and community based insurance scheme membership.

Since more levels of education empower women and improve utilization of these services, there is need for the government to introduce more institutions to increase knowledge and consequently usage of these services. As an alternative, in the short term, health programs need to focus on attracting women with little or no education.

Secondly, women living far to institutions were less likely to use the services means that maternal health care programs should be expanded and intensified in rural areas along with culturally appropriate education campaigns to connect mothers to institutions.

Third, there should be a need for family planning, which encouraged the mothers to reduce the number of children born by a single mother in order to improve usage of institutional delivery. This is because higher birth order was associated with low usage of maternal health care services.

All wealth quintiles were positively related with usage of maternal health care services implying that empowering women in economy encourages them to utilize all outcomes of the service.

In the short run due attention should be payeed for transportation (ambulance) to connect mothers to institutions and improving the quality of service provisions to address poor women in rural areas who are afraid of inappropriate treatments from professionals.

Due attention should be given on community based health insurance membership and follow ups on drop outs as it was found positive and strongly significant for the ANC and PNC outcome variables. Community based health insurance scheme membership improves people attitude towards health services including MHCs and bring about cooperation in the community.

5.1 Areas for further study

This study mainly considers socio economic determinants of maternal health care services in Andabet Woreda. There are further areas of study on socio cultural, behavioral and institutional determinants of maternal health care services other studies might be focused.

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Annex1: Questionnaire for Community Based Survey

Bahirdar University College of Business and Economics Department of Economics

Part One: Verbal Consent

The Researcher is a student of Bahirdar University College of business and Economics Department of Economics. His name is Almaw Tigabu. He is attending a Master of Applied development Economics. He is researching in the area of the determinants of maternal health care services in Andabet Woreda in partial fulfillment of the requirement for the award of a Master's degree in the above named program.

The purpose of this study is to identify factors that affect the utilization of Maternal HealthCare Service. The researcher believes, this study will help to improve the usage of Maternal Health Care Service. The reliability of the information that you provide me is very crucial for the quality of the study. Therefore, you are kindly requested to participate in this study and provide information required from you. Your participation in this study is completely on voluntary bases and you have a right to refuse, to take part or to interrupt the interview at any time. But the information that you will give me is quite useful to improve Maternal Health Care Service in the Woreda.

Are you willing to participate in this study?
1) Yes, Signature_____
2) No_____

If the answer is yes, thanks and conduct the interview. If the answer is no, thanks and transfer to other respondent. Don't force them to participate in the study.

Name of theinterviewer_____signature_____

Date of the interview_____ Month_____2017

Kebele name: ……Kebele code: ……Household code:……

Name of the supervisor_____signature_____

Date of checking_____Month_____2017

Remark: Complete……. Incomplete…….

Part Two: Interview questionnaire for community based survey on Determinants of MHCS Utilization of Maternal Health Services: The Perspective of Women in Andabet Woreda.

Section One: Individual Socio- Economic &Demographic Characteristic

1. How old are you? Choose among the categories.

1. 15-19yearsold 2. 20-34 years old 3. 35-49yearsold

2. What is your marital status?

1. Single 2.Married 3.Divorced 4. Widowed

3. What is your level of education?

1. Never attended school (Illiterate)2. Basic primary Education (Grade 1-8)

3. Secondary school (Grade 9-12)4. Tertiary Level

4. What is your husband Occupation?

1. Farmer 2.Civil Servant

3. Trader 4.Daily laborer 5. Other

5. How many children do you ever have?

1.1-2 children 2.3-4 children 3. More than 5 children

6. What is your husband Education level?

1. Never attended school (Illiterate)2. Basic primary Education (Grade 1-8)

3. Secondary school (Grade 9-12) 4.Tertiary level.

7. House hold wealth

7.1 The material your home made from is?

1. cement and concrete 2. Iron roofed 3.wood 4.leaf

7.2 The type of your toilet?

1. Flush to septic tank 2 Ventilated improved pit latrine3. Pit latrine with slab 4 Pit latrine without slab5. Composting toilet 6. No facility / bush

7.3 What is your level of education?

1.Secondary and above 4. Complete primary

2. Incomplete secondary

3. Incomplete primary 5. No education

7.4 does Household owns table?

1. Yes 2. No

7.5 does Household owns radio (television) ?

1. Yes 2. No

8. do you attend mass media(radio /television/ on maternal health issues?

Section Two: Areal Characteristic

9. Where is your residential area?

1. near to health institutions (urban) 2. Far to health institutions (rural)

10. What do you think the nature of road to health facility?

1. Convenient 2. Inconvenient

11. How do you rate the time taken to get the nearest health facility?

1. Below 1hour2. 1-2 hour 3. Above 2 hour

11. How do you rate the distance that stretched from home to the nearest health facility?

1. Near 2. Average 3. Far

12. Are emergency vehicles/public vehicles accessible for emergent referral of pregnant women?

1. Available 2. Not Available

Section Three : Institutional Characteristics

13**.** Are you member of any local institution (1to 5 and development army)

1. Yes 2. No

If your answer is yes what is the level of strength of the institution you are participating in mobilizing mothers to use health care services?

1. Very strong 2. Moderate 3. Weak

14. Do you have a community level health insurance scheme membership?

1. Yes 2. No

15. Do you think that sufficient professional personnel are available in the health facility

in where you attend maternity health care service?

1. Adequate 2. Inadequate

16. Are you confident on the professional competency of health personnel who gives you

maternal health care service?

1. Yes 2.No

17. Do you think that the health institution where you are attending is equipped adequately with necessary resource such as beds, medical equipments, medications, etc.?

1. Adequate 2. Inadequate

18. Are you comfortable with Privacy and Confidentiality of the Service?

1. Yes 2. No

19. Do you think that health personnel's promotes support and encouragement for your

Utilization of maternal health care service?

1. Yes 2. No

20. Have you got maternal health care service any time particularly delivery care service?

1. Yes 2. No

21. On average for how long do you wait for attending maternity health care service?

1. Less than 1 Hour 2.1-2 Hours 3. 2 -3 Hours 4. Above 3 Hour

22. Have you ever attend maternity health care related education?

1. Yes 2. No

23. Have you got sufficient knowledge and skill on importance of maternal health care Service utilization?

1. Yes 2. No

24. Over all, how do you rate the quality of services you received from health institution?

1. Good 2.Satisfactory 3. Poor

Section Four: Socio-Cultural and Psychological Characteristic

25. Women attitude on maternal health care service

25.1 Do you believe that pregnant women should get antenatal care service from? modern health institutions?

1. Yes 2.No

25.2 Do you think that professional assisted delivery care is crucial for child and Mother health?

1. Yes 2. No

25.3 Do you believe that women after delivery should get postnatal care service?

1. Yes 2. No

26. Does your husband offer you permission to go to maternal health care service?

1. Yes 2. No

26. How does your husband feel the attendance of maternal health care service?

1. Positive 2.Negative 3. Undefined

27. Do your families give you sufficient financial, time, advice, and others supports for the utilization of maternal health care?

1. Yes 2. No

28. Do you have autonomy to decide on the utilization of maternal health care service?

1. Yes 2. No

29. Cultural and religious belief and practice

29.1 Is there any cultural belief and practice that prevent the utilization of antenatal

care?

1. Yes 2. No

If your response is 'Yes', please mention some of it. ----------

29.2 Is there any cultural belief and practice that prevent the utilization of Professionally assisted delivery care?

1. Yes 2. No

If your response is 'Yes', please mention some of it…….

29.3 Is there any cultural belief and practice that prevent the utilization of postnatal Care?

1. Yes 2. No

If your response is 'Yes', please mention some of it…….

30. Do you fear health institution while you seek maternal health care service?

1. Yes 2. No

If your response is 'Yes', please answer the following question. Why did u fear to utilize

health facility service?.....

Section Five: Level of Antenatal Care

31. Did you attend antenatal care service for your recent pregnancy? If your answer is

'No', please give your response for question number 34.

1. Yes, I attended 2. No, I didn't attend

32. Totally, for how many times do you attended Antenatal visits for recent pregnancy?

1. Greater than or Equal to Four Visit 2. Less than four Visit

33. How old was your pregnancy when you started antenatal visits?

1. 1st Trimester /1-3 months of pregnancy/

2. 2nd Trimester /4-6 months of Pregnancy/

3. 3rd Trimester /7-9 months of Pregnancy/

34. Where did you attend your antenatal visits?

1. Hospital 2. Health center 3. Health post 4. Own home

35. What type of professional personnel provides the antenatal care service?

1. Doctor2. Health Officers 3. Nurse 4. Health Extension Worker

36. If not attend antenatal care, what prevented you from attending antenatal visits?

1. I wasn't satisfied on the previous service 6. Bad behavior of health workers

2. Work Overload 7. I was healthy

3. I didn't know the importance 8. Financial Constraints

4. Long distance 9. Husband disapproval

5. Long waiting time 10. Other

If your response is Other, Please mention
it……

Section Six: Level of Delivery Care

37. Where do you deliver your last baby?

1. Health Institution 2. Home

38. Did you receive professional assistance from health personnel while you deliver your last baby?

1. Yes 2. No

39. Where did you attend your professionally assisted delivery care service?

1. Hospital 2. Health center 3. Health post 4. Own home

40. What type of professional personnel provides the professionally assisted delivery care service?

1. Doctor 2. Health Officers 3. Nurse4. Health Extension Worker

41. What made you decide to deliver in a health facility?

1. Because complication of pregnancy 4. No fee

2. Safe delivery for mother and child 5. Good service

3. Received health education during ANC 6. Others

If your response is Other, Please mention it……

42. What made you decide to deliver at home? (Multiple responses are allowed)

1. Sudden onset labour 7. Husband refusal

2. Presence of TBA's and relatives8. Financial constraints

3. To give birth in front of relatives 9. I didn't know importance

4. Transport problem 10. Bad attitude for

5. Long distance to health Facility11. Dislike the behavior of heath workers

6. no past experience of labour problem 12. Other

If your response is Other, Please mention it……

Section Seven: Level of Postnatal Care

43. Have you attend postpartum health care service in 45 days after the last delivery?

1. Yes 2. No

44. Where did you attend your postpartum health care service?

1. Hospital 2. Health center 3. Health post 4. Own home

45. What type of professional personnel provides the postpartum health care service?

1. Doctor 2.Health Officers 3. Nurse 4. Health Extension Worker

46. What was your reason for attending postnatal care?

1. I was sick 3. To check my health and baby health

2. Baby was sick 4. Other

If your response is Other, Please mention
it……..

47. What was your reason for not attending postnatal care?

1. I was healthy 6. Bad behavior of health workers

2. No one attend it here 7. Financial constraints

3. My husband prevents me 8. I didn't know the importance

4. Long distance 9. I wasn't satisfied on service

5. Bad attitude to attend PNC service 10. Other

If your response is Other, Please mention
it……..

Thank you!!

Annex2: Tolerance and variance inflation factor(VIF) to check multicollinearity effects in antenatal care service model

Variable	VIF	1/VIF
mothersed~03	8.82	0.113428
mothersed~04	6.76	0.147940
wealthqua~04	2.70	0.369785
wealthqua~03	2.50	0.400732
exposureto~a	2.50	0.400733
residence	2.48	0.403971
wealthqua~02	2.43	0.411906
ageofthem~02	2.20	0.453921
birthorde~02	2.11	0.472902
ageofthem~03	2.00	0.499286
wealthqua~05	1.98	0.506125
birthorde~03	1.85	0.539464
communityb~e	1.77	0.565808
mothersed~02	1.62	0.617941
localnetwo~p	1.33	0.753134
ocupationo~r	1.15	0.867882
Mean VIF	2.76	

Annex3:Tolerance and variance inflation factor(VIF) to check multicollinearity effects in delivery service model

Variable	VIF	1/VIF
mothersed~03	8.82	0.113428
mothersed~04	6.76	0.147940
wealthqua~04	2.70	0.369785
wealthqua~03	2.50	0.400732
exposureto~a	2.50	0.400733
residence	2.48	0.403971
wealthqua~02	2.43	0.411906
ageofthem~02	2.20	0.453921
birthorde~02	2.11	0.472902
ageofthem~03	2.00	0.499286
wealthqua~05	1.98	0.506125
birthorde~03	1.85	0.539464
communityb~e	1.77	0.565808
mothersed~02	1.62	0.617941
localnetwo~p	1.33	0.753134
ocupationo~r	1.15	0.867882
Mean VIF	2.76	

Annex4: Tolerance and variance inflation factor (VIF) to check multicollinearity effects in postnatacare service model

Variable	VIF	1/VIF
mothersed~03	8.82	0.113428
mothersed~04	6.76	0.147940
wealthqua~04	2.70	0.369785
wealthqua~03	2.50	0.400732
exposureto~a	2.50	0.400733
residence	2.48	0.403971
wealthqua~02	2.43	0.411906
ageofthem~02	2.20	0.453921
birthorde~02	2.11	0.472902
ageofthem~03	2.00	0.499286
wealthqua~05	1.98	0.506125
birthorde~03	1.85	0.539464
communityb~e	1.77	0.565808
mothersed~02	1.62	0.617941
localnetwo~p	1.33	0.753134
ocupationo~r	1.15	0.867882
Mean VIF	2.76	

Annex5: correlation matrix for variables in the ANC service model

```
. pwcorr antenatalcare ageofthemother_01 birthorder_01 motherseducation_02 exposuretomassmedia communitybasedhealthinsurance localnetworkmembership wealthquantile_
> 01 ocupationofthepartner residence
```

	antena~e	ageof~01	birth~01	mothe~02	exposu~a	commun~e	localn~p	
antenatalc~e	1.0000							
ageofthem~01	0.2005	1.0000						
birthorde~01	-0.0452	0.3744	1.0000					
mothersed~02	0.2009	0.0201	-0.0041	1.0000				
exposureto~a	0.5001	0.0609	-0.0782	0.1558	1.0000			
communityb~e	0.2148	0.0184	-0.0191	0.2670	0.0813	1.0000		
localnetwo~p	0.3828	-0.0093	-0.0893	0.1179	0.2838	0.2038	1.0000	
wealthqua~01	-0.4202	-0.0254	0.1410	-0.0546	-0.2555	-0.1103	-0.2608	
ocupationo~r	0.1489	0.0420	0.0215	-0.0515	0.2337	-0.1134	0.1157	
residence	0.1882	-0.0827	-0.1878	-0.0462	0.4412	-0.4647	0.1901	

	wealt~01	ocupat~r	reside~e
wealthqua~01	1.0000		
ocupationo~r	-0.0221	1.0000	
residence	-0.1248	0.2708	1.0000

Annex6: correlation matrix for variables in the delivery service model

```
. pwcorr delivery ageofthemother_01 birthorder_01 motherseducation_02 exposuretomassmedia communitybasedhealthinsurance localnetworkmembership wealthquantile_01 oc
> upationofthepartner residence
```

	delivery	ageof~01	birth~01	mothe~02	exposu~a	commun~e	localn~p
delivery	1.0000						
ageofthem~01	0.0456	1.0000					
birthorde~01	0.0168	0.3744	1.0000				
mothersed~02	0.1760	0.0201	-0.0041	1.0000			
exposureto~a	0.2969	0.0609	-0.0782	0.1558	1.0000		
communityb~e	0.0957	0.0184	-0.0191	0.2670	0.0813	1.0000	
localnetwo~p	0.1517	-0.0093	-0.0893	0.1179	0.2838	0.2038	1.0000
wealthqua~01	-0.2273	-0.0254	0.1410	-0.0546	-0.2555	-0.1103	-0.2608
ocupationo~r	0.1186	0.0420	0.0215	-0.0515	0.2337	-0.1134	0.1157
residence	0.0780	-0.0827	-0.1878	-0.0462	0.4412	-0.4647	0.1901

	wealt~01	ocupat~r	reside~e
wealthqua~01	1.0000		
ocupationo~r	-0.0221	1.0000	
residence	-0.1248	0.2708	1.0000

Annex7: correlation matrix for variables in the delivery service model

```
. pwcorr  postnatalcare ageofthemother_01 birthorder_01 motherseducation_02 exposuretomassmedia communitybasedhealthinsurance localnetworkmembership wealthquantile
> _01 ocupationofthepartner residence
```

	postna~e	ageof~01	birth~01	mothe~02	exposu~a	commun~e	localn~p	
postnatalc~e	1.0000							
ageofthem~01	-0.1440	1.0000						
birthorde~01	-0.0251	0.3744	1.0000					
mothersed~02	0.2956	0.0201	-0.0041	1.0000				
exposureto~a	0.2670	0.0609	-0.0782	0.1558	1.0000			
communityb~e	0.2298	0.0184	-0.0191	0.2670	0.0813	1.0000		
localnetwo~p	0.1349	-0.0093	-0.0893	0.1179	0.2838	0.2038	1.0000	
wealthqua~01	-0.2114	-0.0254	0.1410	-0.0546	-0.2555	-0.1103	-0.2608	
ocupationo~r	0.0305	0.0420	0.0215	-0.0515	0.2337	-0.1134	0.1157	
residence	-0.0034	-0.0827	-0.1878	-0.0462	0.4412	-0.4647	0.1901	

	wealt~01	ocupat~r	reside~e
wealthqua~01	1.0000		
ocupationo~r	-0.0221	1.0000	
residence	-0.1248	0.2708	1.0000

Annex8: variables used in the logistic regression analysis and their respective values

Dependent variables	Value
• Antenatal care for pregnancy	0=not received, 1=received
• Place of delivery	0=home delivery, 1=institutional delivery
• Post natal care service	0= not attained, 1=attained
Independent variables	
• Age of respondent	1=15-19 years 2=20-34 3=35-49
Birth order	1= 1-2birth 2=3-4birth 3=above5
Respondent education level	0=no education 1 =primary 2=secondary 3= above secondary
Partners education	0=no education 1 =primary 2=secondary 3= above secondary
Husbands occupation	O=not skilled 1= skilled
Distance to institutions	0=>1hour 1=<1 hour
Exposure to media	0=exposed 1=not

DECLARATION

I, the undersigned declare that the thesis comprises my own work. In compliance with internationally accepted practices, I have duly acknowledged and referenced all materials used in this work. I understood that non-adherence to the principles of academic honesty and integrity, misrepresentation/fabrication of any idea/data/fact/source will constitute sufficient ground for disciplinary action by the university and can also evoke penal action from the sources which have not been properly cited or acknowledged.

_____

Signature

_____

Name of Student

_____

University ID. Number

_____

Date