

Addis Ababa
University

(Since 1950)



ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**SOCIO-ECONOMIC AND DEMOGRAPHIC DETERMINANTS
OF ANTENATAL AND DELIVERY CARE UTILIZATION IN
RURAL KEBELES OF KALU WEREDA, DEBUB WOLLO
ZONE, AMHARA REGION**



BY
MEKONNEN SEID

JUNE, 2009
Addis Ababa

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**SOCIO-ECONOMIC AND DEMOGRAPHIC DETERMINANTS
OF ANTENATAL AND DELIVERY CARE UTILIZATION IN RURAL
KEBELES OF KALU WEREDA, DEBUB WOLLO ZONE
AMHARA, REGION**

**A THESIS SUBMITTED TO SCHOOL OF GRADUATE
STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF SCIENCE IN POPULATION
STUDIES (REPRODUCTIVE HEALTH)**

BY
MEKONNEN SEID MOHAMED

JUNE 2009
Addis Ababa

**ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

***Socio-economic and Demographic Determinants of Antenatal
and Delivery Care Utilization in Rural Kebeles of Kalu
Wereda, Debub Wollo Zone, Amhara Region***

By
Mekonnen Seid Mohamed



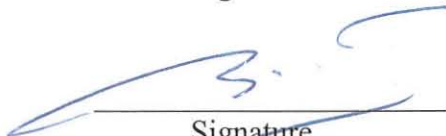
**Institute of Population Studies
College of Development Studies**

Approved by the Examining Board

Dr. Eshetu Gurm
Chairman, Department Graduate Committee


Signature

Dr. Michael Dejene
Advisor


Signature

Dr. Assefa Hailemariam
Examiner


Signature

Acknowledgement

Above all I would like to praise the Almighty God for being in my side in all my endeavors and gave me endurance at times of many challenges and rainy days.

Next I would like to express my heartfelt gratitude and appreciation to my advisor Dr. Michael Dejene for his invaluable guidance, advice and outstanding comments right from the inception of the research proposal up to the last point of this thesis and for providing me his precious time whenever I was in need of his help. Had it not been for his genuine help, this research work would have not been accomplished.

I am highly thankful to Central Statistical Agency for sponsoring my postgraduate study. My special thanks goes to Ethiopian Public Health Association, David and Lucile Packard Foundation and Addis Ababa University for their financial support. I also thank and extend my respect to all staff members of Institute of Population Studies for their contribution in the process of my study.

My heartfelt gratitude and special thanks goes to my sister Alemshay Seid who gave me all rounded support in this journey. Indeed she deserves special thanks beyond what words can express. My deepest thanks also refer to my father Seid Mohamed, my mother Hawa Mohamed and my brothers Seid Yimem, Ababaw Seid , Moused Seid and Osman Mohamed who gave me unreserved support during data collection. My heartfelt appreciation goes to my son Elias Mekonen for his contribution during data collection and this thesis is dedicated to him.

I am enormously indebted to my friends Negussie Dejene, Tederos Woletaw, Abay Getachew, Kassu Gebeyehu and Samuel Hailu who gave me their support and encouragement and who have contributed a lot at different stages of writing the thesis.

Last but not least I would like to express my thanks to the enumerators, supervisors and W/ro Haregweyn Yimer, (Kalu Wereda administrator) and participants of the study for their cooperation and patience during the data collection

Table of contents

| | Page |
|---|------------------|
| <i>Acknowledgement</i> | <i>i</i> |
| <i>Table of Contents</i> | <i>ii</i> |
| <i>List of Tables</i> | <i>v</i> |
| <i>List of Figures</i> | <i>vi</i> |
| <i>List of Annexes</i> | <i>vii</i> |
| <i>Acronyms</i> | <i>viii</i> |
| <i>Abstract</i> | <i>ix</i> |
| <i>Chapter One</i> | <i>1</i> |
| <i>Introduction</i> | <i>1</i> |
| 1.1 Background | <i>1</i> |
| 1.2 Statement of the problem | <i>3</i> |
| 1.3 Rationale and significance of the study | <i>6</i> |
| <i>Chapter Two</i> | <i>8</i> |
| <i>Review of Related Literature</i> | <i>8</i> |
| 2.1 Theoretical background | <i>8</i> |
| 2.2 Research findings | <i>9</i> |
| 2.3 Demographic and socio-economic factors | <i>11</i> |
| 2.3.1 Demographic factors..... | <i>11</i> |
| 2.3.2 Socio- economic factors | <i>12</i> |
| 2.4 Preventing mother- to- child transmission of HIV (PMTCT) | <i>14</i> |
| 2.5 Family Planning | <i>16</i> |
| 2.6 Operational definitions of key terms and concepts | <i>18</i> |
| 2.7 Conceptual Framework of the study | <i>19</i> |
| 2.8 General objective of the study | <i>22</i> |
| 2.8.1 Specific objectives | <i>22</i> |
| 2.9 Hypotheses to be tested | <i>22</i> |
| <i>Chapter Three</i> | <i>23</i> |
| <i>Research design and methodology</i> | <i>23</i> |
| 3.1 Background of the Study Area | <i>23</i> |
| 3.2 Data Sources | <i>23</i> |



| | | |
|---------------------------|--|-----------|
| 3.3 | Sample Design and Sample Size | 24 |
| 3.3.1 | Sample Design | 24 |
| 3.3.2 | Sample Size Determination | 25 |
| 3.3.3 | Field organization, training and data collection | 26 |
| 3.4 | Ethical considerations | 26 |
| 3.5 | Method of data analysis | 27 |
| 3.6 | Variables included in the study | 27 |
| 3.7 | Limitation of the study | 28 |
| Chapter Four | | 29 |
| Results | | 29 |
| 4.1 | Socio-economic and demographic characteristics of respondents | 29 |
| 4.2 | Access to mass media | 31 |
| 4.3 | Antenatal Care (ANC) | 32 |
| 4.3.1 | Use of antenatal care..... | 32 |
| 4.3.2 | Number of antenatal care visits | 33 |
| 4.3.3 | Timing of antenatal visits | 34 |
| 4.3.4 | Access to health services | 35 |
| 4.3.5 | Reasons for not attending ANC | 36 |
| 4.3.6 | Bivariate test for utilization of antenatal care..... | 37 |
| 4.3.7 | Multivariate analysis for utilization of antenatal care | 40 |
| 4.4 | Delivery Care | 43 |
| 4.4.1 | Use of child delivery services | 43 |
| 4.4.2 | Delivery attendant..... | 45 |
| 4.4.3 | Reasons for home delivery | 47 |
| 4.4.4 | Bivariate test for utilization of child delivery services | 48 |
| 4.4.5 | Multivariate analysis for utilization of child delivery services | 50 |
| 4.5 | Use of Postnatal Care | 53 |
| 4.6 | HIV/AIDS among women who have attended ANC | 53 |
| 4.7 | Use of family planning | 54 |
| 4.7.1 | Current use of family planning | 55 |
| 4.8 | Decision making power of women | 57 |
| Chapter Five | | 58 |
| Discussion | | 58 |

| | |
|---|----|
| <i>Chapter Six</i> | 64 |
| <i>Conclusion and Recommendations</i> | 64 |
| 6.1 Conclusion | 64 |
| 6.2 Recommendations | 66 |
| <i>References</i> | 68 |
| <i>List of Annexes</i> | 73 |

List of Tables

| | Page |
|--|------|
| Table 1 Socio-economic and demographic characteristic of the respondents in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 009..... | 30 |
| Table 2 Percentage distribution of women who are pregnant or had live birth in the last 3 years and who were exposed to specific media by frequency of Attending media and by ownership of radio and television in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 31 |
| Table 3 Percentage distribution of women who are pregnant or had live birth in the last 3 years by use of ANC for the most recent birth by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 33 |
| Table 4 Percentage distribution of women who are pregnant or had live birth in the last 3 years by time of the first ANC visits for the most recent birth, in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 35 |
| Table 5 Percentage distribution of women who had live birth in the last 3 years by the average time taken to reach the nearest health facility in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009 | 36 |
| Table 6 Percentage distributions of women who are pregnant or had live birth in the last 3 years for not attending ANC by reasons in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 37 |
| Table 7. Distribution of utilization of ANC by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009 | 39 |
| Table 8. Parameter estimates of logistic regression for the dependant variable, utilization of ANC with selected predictor variables in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 42 |
| Table 9. Percentage distribution of women who had live birth in the last 3 years by place of delivery and selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009 | 44 |
| Table 10. Percentage distribution of women who had live birth in the last 3 years by person providing assistance during delivery by selected background Characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009 | 46 |
| Table 11. Percentage distribution of women who had live birth in the last 3 years who delivered at home by reason in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 47 |
| Table 12. Distribution of place of delivery by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February, 2009 | 49 |
| Table 13. Parameter estimates of logistic regression for the dependent variable, place of delivery with selected predictor variables in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009 | 52 |
| Table 14 Percentage distribution of women who had live birth in the last 3 years, who are currently using family planning by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009..... | 56 |
| Table 15 Percentage distribution of women who are pregnant or had live birth in the last 3 years by participation in decision making on different issues in the household in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, 2009 | 57 |

List of Figures

| | <u>Page</u> |
|---|-------------|
| Figure 1. Utilization of antenatal care | 32 |
| Figure 2. Number of antenatal care visits..... | 34 |
| Figure 3. Percentage of women by use of family planning | 54 |

List of Annexes

Annex I

| | <u>Page</u> |
|--|-------------|
| Table 16 Percentage distribution of women who had live birth in the last 3 years, who got Information about HIV/AIDS, Knowledge about methods of MTCT of HIV and medicine, and who took HIV test during ANC for the most recent birth..... | 73 |
| Table 17 Total number of women who got services on antenatal, delivery Post natal care and family planning in kalu Wereda from 2005-2008..... | 73 |
| Table 18 Percentage distribution of women who had live birth in the last 3 years who attended Postnatal care for the most recent birth by selected background characteristics..... | 74 |
| Table 19 Percentage distribution of women who had live birth in the last 3 years, By knowledge, currently use, ever use and future use of family planning | 75 |
| Table 20 Percentage distribution of women who are pregnant or gave live birth in the last 3 years who got information about family planning by information provider..... | 75 |
| Table 21 Percentage distribution of women by contraceptive methods currently used .. | 75 |
| Table 22 Percentage distribution of women by most recent source /place of obtaining contraceptive methods currently used..... | 76 |

Annex II

| | |
|---------------------|----|
| Questionnaire. | 77 |
|---------------------|----|

Acronyms

| | |
|--------|--|
| AIDS | Acquired Immune Deficiency Syndrome |
| ANC | Antenatal Care |
| CSA | Central Statistical Agency |
| CAZS | Centre For Arid Zone Studies |
| EA | Enumeration Area |
| EDHS | Ethiopian Demographic Health Survey |
| FGD | Focus Group Discussion |
| FP | Family planning |
| HAPCO | HIV/AIDS Prevention and Control Office |
| HIV | Human Immuno Deficiency Virus |
| MOH | Ministry of Health |
| MHC | Maternal Health Care |
| PMTCT | Preventing of Mother- to- Child Transmission |
| STD | Sexually Transmitted Diseases |
| STI | Sexually Transmitted Infections |
| TBA | Traditional birth attendant |
| TT | Tetanus Toxioid |
| UNICEF | United Nations International Children Fund |
| UN | United Nations |
| UNFPA | United Nations Fund for Population Activity |
| VCT | Voluntary Counseling and Testing |
| WHO | World Health Organization |
| WMS | Welfare Monitoring Survey |

Abstract

Each year a large number of women are dying due to factors associated with pregnancy and childbirth in developing countries. Antenatal and delivery care are the most important interventions for reducing maternal and child mortality.

A community based cross-sectional survey was conducted in February 2009 with the main objective of assessing socio-economic and demographic factors that determine antenatal and delivery care utilization in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region. Simple random sampling technique was used to select representative kebeles and enumeration areas. A total of 312 women who were pregnant at the time of the survey or had live births within the 3 years preceding the survey date were the respondents for the survey. Quantitative and qualitative methods of data collection were employed to gather the required information from the respondents.

The result of the study revealed that 37.2% of the women received ANC either during the current pregnancy or at the time of their previous pregnancies and the majority of them (65.5%) made 2-3 ANC visits. About 40% of women visited health facilities for ANC check up in the third trimester of their pregnancy. Concerning the latest births, (85.2%) of the babies were delivered at home and about 37% and 25% of the deliveries were attended by untrained traditional birth attendants and relatives, respectively.

The bivariate test shows that age, average monthly income, total children ever born, average time taken to reach the nearest health facility and education have statistically significant association with utilization of ANC with ($X^2=101.7, P=0.000$), ($X^2=23.7, P=0.000$), ($X^2=53.4, P=0.000$), ($X^2=21.1, P=0.000$), ($X^2=50.9, P=0.000$)). In addition, age, average monthly income, total number of children ever born, average time taken to reach the nearest health facility and education also shows statistically significant association with utilization of health facility delivery with ($X^2=8.1, P=0.017$), ($X^2=9.9, P=0.007$), ($X^2=12.5, P=0.002$), ($X^2=11, P=0.001$) and ($X^2=12.2, P=0.000$), respectively. Moreover, the multivariate analysis revealed that age, average monthly income, awareness about benefit of ANC have significant relationship with utilization of ANC. Likewise, total number of children ever born, marital status and access to radio are found to have significant effect on utilization of health facility delivery. Being in a state of good health was the main reason for not using ANC, while, it is usual practice is reported as the main reason for home delivery.

Promoting the use of ANC, postnatal care and facility-based and safe home based deliveries by providing information and education on maternal service utilization, encouraging women education and improving the status of women in the community are recommended.

Chapter One

Introduction

1.1 Background

Worldwide, it is estimated that 529,000 women die every year from complications of pregnancy and childbirth, which is about one woman every minute. About 99 percent of these deaths occur in developing countries, where a woman's lifetime risk of dying from pregnancy-related complications is 45 times higher than that of her counterparts in developed countries. The risk of dying from pregnancy related complications is highest in sub-Saharan Africa and in South-Central Asia, where in some countries the maternal mortality ratios are more than 1,000 deaths per 100,000 live births (WHO, 2005).

Sixty to eighty percent of maternal deaths are due to obstetric hemorrhage, obstructed labor, hypertensive disorders of pregnancy, and complications of unsafe abortion. These direct complications are unpredictable and most occur within hours or days after delivery. In addition, to maternal death, each year over 50 million women experience pregnancy related complications, many of which lead to long term illness or disability. Long-term consequences of pregnancy related complications include uterine prolapsed, pelvic inflammatory disease, fistula, infertility, and pain during sexual intercourse (WHO, 2005).

In recognition of the potential of care during the antenatal period to improve a range of health outcomes for women and children, the World Summits for Children in 1990 adopted antenatal care as a specific goal, namely "Access by all pregnant women to prenatal care, trained attendants during childbirth and referral facilities for high risk pregnancies and obstetric emergencies". Similar aims have been voiced in other major international conferences, including the International Conference on Population and Development in 1994, The Fourth World Conference on Women in Beijing in 1995 and their five-year follow-up evaluations of progress, and the United Nations General Assembly Special Session on Children in 2002.

Moreover international commitment to reduce maternal mortality was reaffirmed in December 2000 when 191 United Nations member states committed themselves to achieving a set of Millennium Development Goals (MDGs) by 2015. The maternal mortality ratio and the proportion of deliveries with a skilled attendant will be used to monitor progress towards this goal (UN, 2000). However, discrepancies continue to exist in access to maternal health care between the developed and developing world, the poor and the rich, rural and urban, and the educated and uneducated societies (WHO, 2006).

The primary objective of antenatal care is to establish contact with the pregnant women, and identify and manage current and potential risks and problems. Few life-threatening complications can be prevented antenatally, but most require interventions at the time of delivery. There are potential benefits from some of the elements of antenatal care, and these benefits may be most significant in developing countries where morbidity and mortality levels among reproductive age women are high. On one hand, the antenatal interventions may be vital to the health of the pregnant women and well-being of their infants and on the other hand, it may provide the path for skilled assistance during delivery. Women receiving antenatal care come in contact with health-care providers who are likely to encourage them to give birth in a medical facility (WHO, 2003).

Child survival is also directly linked to access to professional maternity care. Regular antenatal checkups by trained health providers are necessary to monitor the progress of a pregnancy and identify early on if a woman shows signs of complications. Moreover, an important contributor to lower the health risks to mothers and children associated with a pregnancy is increasing the proportion of babies delivered in a health facility and under the supervision of health professionals (CSA and ORC Macro, 2006).

With adult HIV prevalence of 2.1%, Ethiopia is one of the sub Saharan African countries most severely hit by the epidemic. Besides the dominant heterosexual transmission, vertical virus transmission from mother to child accounts for more than 90% of paediatric AIDS cases. PMTCT programs provide for both prevention of HIV transmission from mother to child and enrolment of infected pregnant women and their families into antiretroviral treatment is an

important method to mitigate the impact of the epidemic in the general population and amongst children in particular (HAPCO and MOH, 2007).

Prenatal care service coverage's are relatively lower in many developing countries, especially in sub-Saharan African countries because of lack of awareness of the importance of ANC, cultural barriers and inaccessibility of the services ...etc (CSA, 2004).

In Ethiopia, the numbers of women who make antenatal care visits are very few and those who make four or more visits during their entire pregnancy are only about 12 percent. The majority of births occur without the help of a skilled assistant (defined as a midwife, nurse trained as midwife, or a doctor) at home or in other non-hospital settings. Home deliveries in the absence of skilled attendants have been associated with adverse infant and maternal outcome. However, home deliveries without a skilled attendant are chosen or occur for a variety of reasons, (the 3 delays), delay to make decision to go to health facility, delay due to transportation, including long distances or difficult access to a health facility and costs of services and delays in health facility to get services due to perceived lack of quality care in a health facility (CSA and ORC Macro, 2006).

1.2 Statement of the problem

Motherhood should be a time of expectation and joy for a woman, her family, and her community. However, for women in developing countries, the reality of motherhood is often grim. For these women, motherhood is often marred by unforeseen complications of pregnancy and childbirth. Some die in the prime period of their lives and in great distress: from hemorrhage, obstructed labor, or severe infection after delivery or unsafe abortion (WHO, 2005).

A mother's death carries profound consequences not only for her family, especially her surviving children, but also for her community and country. In some developing countries, if the mother dies, the risk of death for her children under age 5 is doubled or tripled. In addition, because a woman dies during her most productive years, her death has a strong

social and economic impact. Her family and community lose a productive worker and a primary care giver (WHO, 2005).

Complications of pregnancy and childbirth are the leading cause of death and disability for women in developing countries aged 15 – 49. Of all the health statistics monitored by WHO, maternal mortality has the largest discrepancy between developed and developing countries. Women's lifetime risk of dying from pregnancy in Africa is 1 in 16 - 20 while it is 1 in 1400 in Europe and 1 in 3700 in North America. Unsafe motherhood is caused by a number of factors, including women's poor health and nutrition before pregnancy, inadequate, inaccessible and unaffordable health care during childbirth. Socio economic and cultural realities also make a lot of contributions i.e. poverty, women's unequal access to resources including health care, food and preventive services, their heavy physical work load, which often continues throughout pregnancy, and their lack of decision making power in families, communities and societies. Good quality maternal health care is the single most important intervention to prevent maternal and newborn mortality and morbidity (Mesganaw, 2001).

Ethiopia ranks lowest in ANC coverage when compared with sub-Saharan African countries. About nine in ten women received ANC service from a health professional in Rwanda, Malawi, Ghana, Lesotho, Kenya and Senegal compared with less than three in ten Ethiopian women. Similarly, the proportion of women who received at least two doses of tetanus toxoid (TT) injection during their most recent pregnancy is relatively lower in Ethiopia. The percentage of women receiving two or more doses of TT injection during their most recent pregnancy is more than twice as high in Malawi, Senegal, Lesotho and Tanzania than in Ethiopia (5 percent) (CSA and ORC Macro 2006, Macro Int. Inc., 2007).

Ethiopia ranks lowest among 14 sub-Saharan African countries concerning delivery assistance from a health professional and delivery in health facility,. The percentage of births delivered by a health professional is 10 times higher in the Cameroon (62 percent) than in Ethiopia (6 percent). Similarly, the proportion of births delivered in a health facility is more than 10 times higher in Senegal (62 percent), Malawi (57 percent) and Lesotho (52 percent), than in Ethiopia (5 percent) (CSA and ORC Macro 2006, Macro Int. Inc., 2007).

In Ethiopia the national maternal and infant mortality levels are among the highest in the world. The maternal mortality ratio is estimated at 673 per 100,000 live births and infant mortality ratio is 77 per 1000 live births. Only 12% of women make four or more antenatal care visits during their entire pregnancy. There is marked variation in accessing the recommended at least four visits during pregnancy between women residing in urban areas (55 percent) and those in rural areas (8 percent). Only 28 percent of mothers received antenatal care from health professionals (doctors, nurse, midwife) and less than 1 percent of mothers received antenatal care from a traditional birth attendant (trained or untrained). More than seven in ten mothers (72%) received no antenatal care. Among women with a live birth, 10 percent took iron tablets and 28 percent had received two or more tetanus toxoid injections while pregnant with the last birth (CSA and ORC Macro 2006).

In Ethiopia, only 6% of births were delivered with the assistances of a trained health professional, that is a doctor, nurse, or midwife and 28% are delivered by a traditional birth attendant. The majority of births were attended by a relative or some other person (61%), and 5% of all births were delivered without any type of assistance at all. An overwhelming majority of births (94%) were delivered at home, 5% of births were delivered in a public facility and less than 1% of births were delivered in a private facility (CSA and ORC Macro 2006).

The situation in Amhara Region concerning antenatal care is as grim as that of the whole country. About 27% of mother received antenatal care from health professionals and about 73% of women received no antenatal care. Assessing place of delivery, only about 4% deliveries were attended in health facility and about 96% were delivered at home. Moreover, only about 4% of the births were delivered with the assistance of trained health professionals, about 30% delivered with the assistance of traditional birth attendant and 65% were attended by a relative or some other person (CSA and ORC Macro 2006).

One explanation for the poor health outcomes among women in Ethiopia is unavailability and poor access to modern health services by a large number of women. Despite the fact that maternal health care utilization is important for further improvement of maternal and child

health, little is known from EDHS about the current magnitude of use and factors determining the use of ANC and delivery care services in Ethiopia. Hence, the aims of this study are to assess the level of antenatal and delivery care utilization and to explore some of the socio-economic and demographic factors that adversely affect the use of maternal care services among women living in Kalu Wereda of Debub Wollo Zone, Amhara Region.

1.3 Rationale and significance of the study

Antenatal and safe delivery care utilization are significant in developing countries where morbidity and mortality among reproductive age women are high. The antenatal period clearly presents opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and that of their infants. The antenatal period is used to inform women and families about danger signs and symptoms and about the risks of labour and delivery, it may provide the route for ensuring that pregnant women do, in practice, deliver with the assistance of a skilled health care provider (WHO, 2003).

The antenatal period provides an opportunity to supply information on birth spacing, which is recognized as an important factor in improving infant survival. Better understanding of fetal growth and development and its relationship to the mother's health have resulted in increased attention to the potential of antenatal care as an intervention to improve both maternal and newborn health. Tetanus immunization during pregnancy can be life-saving for both the mother and the infant. The prevention and treatment of malaria among pregnant women, management of anemia during pregnancy and treatment of STIs can significantly improve fetal outcomes and maternal health (WHO, 2005).

More recently, the potential of the antenatal period as an entry point for HIV prevention and care, in particular for the prevention of HIV transmission from mother to child, has led to renewed interest in access to and use of antenatal care services. Increasing knowledge of ways in which HIV can be transmitted from mother to child and the fact that the risk of transmission can be reduced by using antiretroviral drugs is critical to reduce mother to child transmission (MTCT). In Ethiopia although 69% of women and 75 % of men know that HIV can be



transmitted by breast feeding only slightly more than one-fifth of women and one-fourth of men know that the risk of mother- to child transmission (MTCT) can be reduced through the use of certain drugs during pregnancy. Hence, antenatal care service is significant to screen HIV infected women and can save the lives of thousands of new born babies from HIV infection (CSA and ORC Macro 2006).

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications and infections that may cause the death or serious illness of the mother, baby or both. Obstetric care from a trained provider during delivery is recognized as critical for the reduction of maternal and neonatal mortality(CSA and ORC Macro 2006).

In Ethiopia especially in rural areas, there is a limited research on maternal health care. Adequate knowledge on factors associated with maternal health will help in designing programs to improve antenatal and delivery care utilization and assess their progress towards achieving the Millennium Development Goal of improving maternal health. Therefore, the findings of this research will have programmatic implications and will be helpful to accelerate designing and implementing effective maternal health programs that will have targeted interventions. On top of this, it will pave the way for further research study and provide valuable information for policy makers and planners.

Chapter Two

Review of Related Literature

2.1 Theoretical background

A framework for household and community newborn and maternal care was developed in safe motherhood and child survival program. The framework identifies five paths that, if implemented well, would generally improve newborn outcomes: (1) use of routine maternal and newborn care and good quality services; (2) response to maternal danger signs; (3) response to the non breathing newborn; (4) care for the low birth weight baby; and (5) response to newborn danger signs, particularly those of infections. This model balances preventive and curative care (David R Marsh, et al, 2002). The Mother-Baby Package, based on the four pillars of safe motherhood model is similarly used for identification of four key safe motherhood strategies which form the basis for programming- family planning; antenatal care; clean/safe delivery and essential obstetric care (WHO, 1999).

Antenatal care represents a unique opportunity to improve the health of women and their infants. The early initiation of antenatal care is important to prevent and treat anemia, know about and access voluntary counseling and testing of HIV (VCT) services, treatment of malaria, screen and treat syphilis and to identify and manage women with medical complications. Early care also allows for the development of interpersonal relationships between health care providers and the pregnant woman so that her particular needs and wants are known and expressed in a plan for delivery.

Health professionals recommend that the first antenatal visit should occur within the first three months of pregnancy and continue on a monthly basis through the 28th week of pregnancy and fortnightly up to the 36th week. WHO recommends that a woman without complications need to have at least four ANC visits to provide sufficient care (CSA and ORC Macro, 2006).

At delivery, the importance of skilled attendance has long been recognized. However, distance to health facilities, inadequate transportation and the need for immediate and specialized services have hampered women's ability to access these services. Attention to clean and

hygienic delivery practices and the provision of essential care for the newborn, such as thermal protection and early and exclusive breast-feeding, are important for the health of all infants whether born at home or in a health care facility. Community and primary care level interventions targeting the reduction of maternal and neonatal mortality have been found to be highly cost effective, although in many communities these services are still lacking (WHO, 2006).

2.2 Research findings

Results of different studies from the late 1990s and for early 2000 showed that just over 70% of women worldwide visited a skilled provider during pregnancy at least once for their antenatal care i.e. 98% from the industrialized 68% of women from developing countries had at least one ANC visit. The region of the world with the lowest levels of ANC service use is South Asia, where only 54% of pregnant women have at least one antenatal care visit. In sub-Saharan Africa 68% of women are reported to have at least one antenatal visit. The level in the remaining regions of the world ranges from 82% to 86% (WHO, 2005).

WHO recommends that antenatal care for the majority of normal pregnancies should consist of four visits during pregnancy. In 33 of the 45 developing countries where data was collected at least 50% of women reported four or more visits. There are of course, some notable exceptions; countries with relatively high percentages of women who received only one antenatal care visit include Bangladesh, Ethiopia, Morocco, Nepal and Yemen. The South Asian countries are distinguished by their overall low level of use. In Nepal, for example, 38% of women reported at least one visit but only 9% reported four or more visits, with most women having two or three antenatal visits (WHO, 2003).

A surprising finding is the frequency of four or more antenatal visits in sub-Saharan Africa, with at least 70% of women reporting four or more visits in Ghana, Nigeria, Tanzania and Zambia. In Rwanda and Senegal, on the other hand, 75% and 72% of women report only two or three visits, respectively (WHO, 2003).

A study aimed at examining the use of antenatal and delivery care amongst women in a semi-urban community in Uganda found that antenatal services were well utilized, but that the availability of individual services varied with mothers' ability and willingness to travel a moderate distance to a facility providing a good service. Access to good delivery care service appeared more problematic especially for poorer, less educated women. Women who delivered their infants at home with no trained assistance commonly reported financial or transportation difficulties as key factors (Carolyn J Tann et. al, 2007).

A study conducted in North Gonder, Northwest Ethiopia revealed that a total of births delivered in health facilities is low in the area as only 13.5 % of mothers gave birth to their last babies in health facilities. Only about 25 of the rural women gave birth in the health institutions. Untrained traditional birth attendants and relatives attended 76.4% of the deliveries. The reported reasons were: absence of health problems, short duration of labor, preferring the attention of relatives and trust in traditional birth attendants. Educational status of the mothers, place of residence, access to radio, monthly income, prenatal care, history of intrapartum complications and other selected obstetric behaviors of the respondents showed statistically significant association with the utilization of safe delivery services. In general, this study revealed that the proportion of births delivered in health facilities is low in the area. Demographic and socio-cultural factors were found to be barriers to the utilization of safe delivery services (Mesfin et al, 2004).

A study conducted in Tanzania showed that although almost all (99.8%) interviewed women attended ANC at least once during their last pregnancy, only 46.7% reported to deliver in a health facility and only 44.5% were assisted during delivery by a skilled attendant. Distance to the health facility, discussion with the male partner on place of delivery, advise to deliver in a health facility during ANC and knowledge of pregnancy risk factors showed significant association with use of skilled care at delivery (Mpembeni RN et al., 2007).

A study was carried out to examine the association between population indicators of access to obstetric care and levels of maternal mortality in urban and rural areas in eight West African countries . The study showed that in rural areas, maternal mortality was 601 per 100,000 live

of antenatal care by younger women is a key entry point for HIV testing and efforts to prevent mother-to-child transmission of HIV (WHO, 2003). However, the distribution of women that received prenatal care by age in Ethiopia displays somewhat a different pattern where 39.5 percent women aged 15-19 and 24 percent of women aged 45-49 have received prenatal care and the national average is 37.3 percent (CSA, 2004).

b) Parity

Although age and parity (number of births per women) are closely correlated, higher parity appears to have more of an effect on antenatal care use than age. In the vast majority of developing countries, women expecting their first child are the most likely to present for antenatal care. In countries, such as Egypt, India and Turkey, the drop-off with increasing parity is steep. For instance, antenatal care use in Egypt decreases from 41% for first births to 13% for sixth or higher-order births (WHO, 2003).

2.3.2 Socio- economic factors

a) Education

In developing countries as a whole, educated women are more likely to receive antenatal care and the likelihood of their using antenatal care is associated with their level of education. Educated women are more likely to report four or more visits in most developing countries (WHO, 2003).

Only about one-quarter of Ethiopian women with a birth in the five years before the survey (2005), received antenatal care from a health care professional. However, educated women are much more likely to have access to antenatal care than women with little or no education. For example, 81 percent of women with secondary education or higher received professional antenatal care compared to only 22 percent of women with no education. Educated women are also more likely to receive the various components of antenatal care. Almost a quarter of women with secondary or higher education took iron tablets, compared to less than 10 percent of women with no education. Almost 60 percent of women with secondary or higher education received at least two doses of tetanus toxoid injections, compared to 40 percent of

some 86% of women in urban areas report at least one antenatal visit and 61% report four or more visits. By contrast, the figures for women in rural areas are only 65% and 39%, respectively. As a general rule, urban/rural differences are greatest when overall use of antenatal care is low. For example, in Bangladesh, Ethiopia, Morocco, Pakistan and Yemen, the urban rate for four or more visits is at least six fold the rural rate; Zimbabwe is notable for rural levels roughly the same as the urban levels (WHO, 2003).

In Ethiopia significant difference between rural and urban areas is also revealed. In urban areas more than seven out of ten women (71.9 percent) reported to have received prenatal care, while the finding in rural areas indicates only three out of ten women (34 percent) (CSA, 2004).

d) Access to health services

Availability of health institutions at a reasonable distance from households indicates a fair distribution of health service rendering institutions in the communities. In Ethiopia among households 50.5 percent, 41 percent, and 18.6 percent are within a distance of less than 10 kilometers from health post, health center and hospital in that order. The majority (77 percent) of rural households are 20 or more kilometers away from hospital compared to 38 percent of urban dwellers. Further assessment revealed that almost all of the urban households (95 percent) could get clinic in a distance of less than 10 kilometers compared to only 56 percent of rural households (CSA, 2004).

2.4 Preventing mother- to- child transmission of HIV (PMTCT)

Mother-to-child transmission (MTCT) is when an HIV positive woman passes the virus to her baby. This can occur during pregnancy, delivery or breastfeeding. Without treatment around 15-30% of babies born to HIV positive women will become infected with HIV during pregnancy and delivery. A further 5-20% will become infected through breastfeeding (WHO, 2006).

In 2007, around 370,000 children under 15 become infected with HIV mainly through mother-to-child transmission. About 90% of these MTCT infections occurred in Africa where AIDS is

39%, 19%, 9%, respectively. Moreover, the study showed that in Amhara region 75% of the women do not have knowledge about PMTCT (AED-LINKAGES, 2004).

2.5 Family Planning

Family planning means having the number of children you want when you want them. By allowing women and men to control the number and spacing of their children, family planning helps women and their families preserve their health and fertility and also contribute to improving the overall quality of their lives.

The prevention of unwanted pregnancy protects the mother from being exposed to the unnecessary risks of pregnancy and childbirth, and to the risks of induced unsafe abortion. Hence, a strategy for safe motherhood would be to ensure universal access to family planning information and services to all women in the reproductive age group. Family planning helps women protect themselves from unwanted pregnancies. Since the 1960s family planning programs are said to have helped women around the world avoid 400 million unwanted pregnancies. As a result, many women's lives have been saved grave consequences of unsafe abortions. Also many family planning methods have other health benefits. For example, some hormonal methods help protect against certain cancers, and condoms provide protection against STDs, including HIV/AIDS (Mesganaw, 2001).

Analysis done on the 2003 demographic and health survey in Kenya demonstrates the significant unmet need among women during the first year postpartum in Kenya. The need for both spacing and limiting for women indicates an important area for family planning programmatic support. The analysis also graphically portrays women's vulnerability to pregnancy beginning within the first months after delivery and continuing through the first year postpartum, a period often neglected by both maternal and newborn health and family planning programs. In addition, the relationship between family planning use and the use of antenatal care has important implications for women's access to critical maternal health services. Ensuring that postpartum women have access to quality postpartum services, including family planning and counselling about birth spacing and limiting options, is an

intermediate variables, awareness about the benefit of ANC and health facility delivery and women decision making power.

Women's empowerment includes decision-making power on their own health and has strong direct impact on families and children. When women lack decisions on household income and other resources, they and their children are more likely to receive less food, and to be denied essential health services and education. Moreover, awareness about the benefit of ANC and health facility delivery is an important tool to increase utilization of maternal health care services.

2.6 Operational definitions of key terms and concepts

Antenatal care / Prenatal care:- It is health care received by mothers at the time of their pregnancy from health professionals. Antenatal care is more beneficial in preventing adverse pregnancy outcomes when it is sought early in the pregnancy and continued through to delivery. Health professionals recommend that the first antenatal visit should occur within the first three months of pregnancy and continue on a monthly basis through the 28th week of pregnancy and fortnightly up to the 36th week (or until birth)(WHO, 1996).

Delivery care:- The service given for a pregnant woman during labor, management of normal delivery and detection of complications, management of risk cases in labour and complicated cases (MOH, 2005/06). In this study delivery care is considered as a care given by a trained health professional, during delivery.

First Trimester:- The period between the date of conception and the end of the third month of pregnancy (WHO, 1996).

Health facilities:- Health institutions such as hospitals, health centers health stations or clinics and health posts that provide antenatal and delivery care.

Neonatal mortality:- The probability of dying between birth and exact age one month.

Second Trimester:- The period after the third month of pregnancy till the end of the sixth month (WHO, 1996).

Skilled Birth attendant/SBA:- refers exclusively to people with midwifery skills (for example midwives doctors and nurses) who have been trained to proficiency in the skills

race/ethnicity measures the ability of the individual to cope with the problem, the resource availability in the community, and the state of the physical environment.

Health beliefs are values and knowledge about health and the health care system that influence utilization and these include general attitudes towards medical care, physicians and diseases. Personal enabling factors include income, health insurance, and regular source of care, travel and waiting time. Organizational enabling factors include the ability of health care providers and their spatial distribution (Anderson, 1995, cited in Tarik in 2008).

Women's awareness about the benefit of health services and empowerment at the household level, that includes decision-making power on allocation of resources for food, health care, schooling and other family necessities are vital to the health and well being of both women and children. When women share equally in household decisions, they tend to provide more care adequately and fairly for their children (Anderson, 1995).

To develop the conceptual framework for this study, demographic and socio-economic factors are taken as an independent variable, which can influence either, directly the use of antenatal and delivery care services or through the intermediate variables. The intermediate variables are awareness about the benefit of the services and women's decision-making power, which facilitate the use of the services. The dependent variables are ANC visits, place of delivery and assistance during delivery.

2.8 General objective of the study

The general objective of the study is to identify and examine the main socio-economic and demographic factors that determine antenatal and delivery care utilization in rural Kebeles of Kalu wereda.

2.8.1 Specific objectives

1. To identify the effect of age, parity, education, income and time taken to reach health facilities on antenatal and delivery care utilization.
2. To assess the level, timing and number of antenatal care utilization and identify the average number of antenatal care visits in the rural kebeles of Kalu Woreda.
3. To identify the type of delivery assistance and place of delivery.

2.9 Hypotheses to be tested

Based on the stated research problem the researcher will try to focus on the study objectives by testing the following hypotheses.

1. Educated women are more likely to have higher utilization of antenatal and safe delivery care services than uneducated women
2. Mothers of younger age (15-34) are more likely to have higher utilization of antenatal and delivery care services than older women (35-49)
3. Women who are in the higher income group are more likely to use antenatal and delivery care by health professional than women with lower income group.
4. Lower parity women (≤ 2 children) are more likely to have higher utilization of antenatal services and delivered in health facilities than higher parity women (> 2 children)
5. The longer the time women spent to reach the nearest health facility the lower they will use antenatal and delivery care.

Chapter Three

Research design and methodology

3.1 Background of the Study Area

Kalu wereda is located in the Eastern part of Debu Wollo Zone of the Amhara Regional State. The population of Kalu wereda is estimated to be 186,650 (CSA, 2008). About 89.1 % of the total population is estimated to live in the rural areas, while 10.9 % live in urban areas. Females constitute about 49.4 % of the population of the Wereda. Female in which those aged 15-49 accounts about 47.3 % of the total female population. Kalu wereda has 29 rural kebeles and this study will cover representative sample kebeles in rural areas of the wereda.

According to Kalu Wereda health office, 21 health posts and 3 health centers were built from 2005-2008 and they are currently providing services to the community. Total number of women who got services on ANC, delivery care, postnatal care and family planning from health facilities in Kalu Wereda from 2005 to 2008 shows an increasing trend. The increase in providing services in the last four years is due to increased performance of health facilities as part of the implementation of Health Sector Development Plan (HSDP) by the government (Table 17, annex I).

3.2 Data Sources

Both primary and secondary sources of data were used for this study. Primary data were collected by using structured questionnaire, which was prepared in English and later translated into local language Amharic. The individual questionnaire has ten different sections. To enhance the validity and reliability of the information, the questionnaire was developed with reference to the 2005 Ethiopian Demographic and Health Survey. The questionnaire was pretested among women found in rural areas around Addis Ababa and was modified based on the feedback obtained from the pretest exercise.

Focus group discussions were conducted with women aged 15-49 years and health extension workers separately to get in-depth information on key issues. Two focus group discussions each holding 8 discussants were carried out in Ancheru and Choresa kebeles. Awareness about utilization of ANC care, and reasons for not utilizing antenatal and delivery care services, accessibility of health facilities and quality of services were the main issues discussed during the FGD.

Published and unpublished materials like: books, journals, area specific health service reports obtained from Kalu Wereda health office were the sources of secondary data.

The primary data source (eligible persons for the study) was all women aged 15-49 years who were pregnant at the time of the study or who gave birth in the last three years preceding the study.

3.3 Sample Design and Sample Size

3.3.1 Sample Design

This study is planned to provide information on socio-economic and demographic determinants of antenatal and delivery care utilization in rural areas of Kalu wereda. The target population was all women in reproductive ages, (15 - 49) who were pregnant or who gave birth within three years prior to the survey date. Simple random sampling technique was adopted to select representative kebeles and enumeration areas. The sampling frame that contains the list of kebeles and map of enumeration areas in the selected Kebeles were obtained from the Central Statistical Agency. The central Statistical Agency carried extensive cartographic work in the whole country to prepare enumeration area maps for the 2007 Population and Housing Census to avoid duplication and omission. Accordingly, enumeration area maps prepared for rural areas of kalu wereda were collected from Central Statistical Agency and used to delineate and identify the boundaries of all 28 enumeration areas before the data collection activities were carried out.

3.3.2 Sample Size Determination

The three criteria that usually need to be specified to determine the appropriate sample size are the level of precision, the level of confidence interval and the degree of variability in the characteristics to be measured (Cochran W.G, 1977). However, as for many surveys, sample size determination is a trade-off between the resources available and the desired survey precision. The total number of women aged 15-49 required to be studied is determined based on the proportion of women who attended ANC. Accordingly; the proportion of women who attended ANC in Amhara Region is estimated to be about 27% as indicated in 2005 EDHS.

The formula to estimate the sample size based on simple random sample is:-

$$n=Z^2 p(1-p)/E^2$$

Where:

n= required sample size

Z= confidence level (standard z value) – for this case 95% for which the z value is 1.96

P= proportion of women of age 15-49 years who attend ANC in Amhara Region, which is 0.27 obtained from EDHS 2005.

E= the margin of error- taken as 5%.

Hence,

$$\begin{aligned}n &= (1.96^2) \times (0.27 \times 0.73) / (0.05^2) \\ &= 312\end{aligned}$$

Taking the available resource into consideration, Six kebeles were randomly selected and covered by this study from the list of Kebeles in the Wereda. The selected Kebeles are Jerjero, Agamsa, Werebatulu, Ancharo, Choresa and Addis Alem. The sampled 312 women of reproductive age were allocated proportionally to each of the six kebeles based on population size. The minimum number of women, which was allocated to Ancharo kebele, was 40 and maximum number was 53 allocated to Werebatulu kebele.

Furthermore, total numbers of women allocated to each kebele were further allocated to all enumeration areas found in each kebele based on population size of enumeration areas. Hence, all the 28 EAs found in the six selected Kebeles were covered and used as source of the study population.

3.3.3 Field organization, training and data collection

The research team leader coordinated the fieldwork and facilitated the focus group discussions. Five female interviewers who have completed 12 grade, and two male supervisors with a diploma who are employee of Central Statistical Agency with previous experience in data collection were recruited and intensively trained for two days on the objective of the study, how to fill questionnaires, interviewing techniques, handling of respondents and reading of enumeration area maps. The supervisors were oriented separately about supervision techniques. Five guides were used to supplement the tasks of the data collectors in delineating the EAs. In order to keep the data as accurate as possible, a one-day field practice was held and the necessary discussions were done to clarify the doubts they have and the problem they faced during field practice. Enumerators assigned in each enumeration areas have first delineated the boundary of their respective EAs by using enumeration area maps and with the help of guides. After delaminating the boundaries of the EAs the enumerators and supervisors identified the center of the enumeration areas and by using bottle rotation technique determined the first household where the data collection was started. Taking the first household as a starting point and by moving in a clockwise direction the data collectors moved house to house until the required number of eligible women were interviewed from each EA.

3.4 Ethical considerations

A letter from Population Studies and Research Center was written to have permission from Kalu Wereda administration and selected kebeles administrators to collect data from eligible women. The objective of the study was explained to the identified study subjects and they were asked for their informed assent to participate. They were assured

about the confidentiality of the information they give by explaining the fact that interviews will be held in private and the information obtained from the interviews will never be passed to any individual or institution and no names or identifications will be recorded on the questionnaire. Questionnaires were identified exclusively using codes on the cover pages. After the completion of the interview, all women who did not attend ANC were briefed about the advantage of it and were advised to go for health facilities for antenatal check up.

3.5 Method of data analysis

Data cleaning (office editing) was done manually to minimize the possible errors and the collected data was entered in to computer for analysis. Statistical Package for Social Scientists (SPSS) was used for the purpose of data entry and analysis. Internal consistency checks were carried out by cross tabulating one unit (variable) with another,. Bi-variant analysis such as chi-square test was used in order to assess the degree of association of each independent variable with the dependent variables.

At the multivariate stage, logistic regression model was employed. The technique is the most appropriate method of analyzing dichotomous dependent variable, i.e. a variable that has two options. It (the technique) allows us to assess the net effect of each independent variable on the dependent variable

3.6 Variables included in the study

The independent variables include:-

1. **Demographic variables:-** Maternal age at the time of the study measured in completed years, age at first birth, birth interval, parity, number of living children, child loss experience, marital status.
2. **Socio-economic variables:-** mothers education, occupation of mothers, income, religion, ethnicity, distance to health facilities and exposure to media.
3. **The intermediate variables** are awareness about the benefit of ANC and health facility delivery and women's decision-making power.

3.7 Limitation of the study

- ❖ In this study pregnant women who visited health facility for any medical problems but not intentionally visit health facility to attend ANC might have been considered as if they have received antenatal care.
- ❖ Environmental and cultural factors affect utilization of antenatal and delivery care services. However, except considering them in the focus group discussions they are not analyzed in detail in this study.

Chapter Four

Results

4.1 Socio-economic and demographic characteristics of respondents

A total of 312 women who lived in six rural kebeles and 28 enumeration areas, in the age group 15-49 years and who are pregnant at the time of the survey or have given live birth within three years prior to the survey date were respondents for the study. Of the total 312 women, 21 women were found pregnant at the time of the study and 291 women reported to have at least one live birth within three years preceding the study. The age distribution of the respondents showed that nearly half (46%) are in the age group 20-34 years of age while, 19% and 35% are reported to be in the age group of less than 20 and 35-49 years of age, respectively.

The educational status of respondents revealed that the majority (62.5%) were illiterate and almost a third (33%) had primary level education and only 1.9% reported having secondary and above level of education. The majority 93.6% and 92.3 of the respondents were followers of the Muslim religion and belong to the Amhara ethnic group, respectively. The marital status of the respondents showed that 88.1% were married, 5.4% widowed and 4.8% divorced. Only less than five percent of the respondents reported being engaged in economically productive activities, while, the remaining 94.9% of the respondents labeled themselves as housewives. In the study, average monthly income of the household was asked and it was found out that about a third (36.5%) have less than 500 birr monthly income, 50% indicated as the monthly income for their household ranges between 500-1000 birr, while about 13.5% reported an average monthly income of greater than 1000 birr. Concerning number of children ever born, 47.8% of the women have less than 3 children, 27.8% have 3-5 children and 24.4% have 6 or more children. Nearly a third (31.6%) of the women have experienced child death (Table 1).

Table 1 Socio-economic and demographic characteristic of the respondents in rural Kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Background characteristics | Number | Percent |
|---------------------------------------|--------|---------|
| Age (312) | | |
| < 20 | 59 | 18.9 |
| 20 – 34 | 144 | 46.2 |
| 35 – 49 | 109 | 34.9 |
| Education (312) | | |
| Illiterate | 195 | 62.5 |
| Read and write only | 8 | 2.6 |
| Primary | 103 | 33 |
| Secondary & above | 6 | 1.9 |
| Religion (312) | | |
| Muslim | 292 | 93.6 |
| Christian | 20 | 6.4 |
| Marital Status (312) | | |
| Never married | 2 | .6 |
| Married | 275 | 88.1 |
| Divorced | 15 | 4.8 |
| Separated | 1 | 0.3 |
| Widowed | 17 | 5.4 |
| Living together | 2 | 0.6 |
| Average monthly income (312) | | |
| < 500 | 114 | 36.5 |
| 500 - 1000 | 156 | 50.0 |
| > 1000 | 42 | 13.5 |
| Children ever born (N=291) | | |
| Less than 3 | 139 | 47.8 |
| 3-5 | 81 | 27.8 |
| 6 and above | 71 | 24.4 |
| Total | 291 | 100.0 |
| Child death experience (N=291) | | |
| Yes | 92 | 31.6 |
| No | 199 | 68.4 |
| Total | 291 | 100.0 |

4.2 Access to mass media

Table 2 presents the distribution of women aged 15-49 years by ownership of radio and television and access to mass media. The study shows that 49.7% and 1.9% of households own radio and television, respectively. With regard to print media, 90 % of the women do not read newspaper/magazines at all and 8.7 % read once in a month. Respondents are more likely to be exposed to the radio than any other media. 34.9% of women listen to the radio almost every day and 17.3 % listen at least once in a week, while very few 1.3 watch television every day (Table 2).

Table 2 Percentage of respondents who were exposed to specific media by frequency of attending media and by ownership of radio and television in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Media type | Frequency of attending | | | |
|---------------------------|------------------------|-------------------------|-----------------|------------|
| | Almost every day | At least once in a week | Once in a month | Not at all |
| | Number (%) | Number (%) | Number (%) | Number (%) |
| Read news paper/magazines | 0.0 | 4 (1.3) | 27 (8.7) | 281 (90) |
| Listen to the radio | 109 (34.9) | 54 (17.3) | 16 (5.1) | 133 (42.6) |
| Watch television | 4 (1.3) | 10 (3.2) | 23 (7.4) | 275 (87.8) |
| | Ownership | | | |
| | Yes | | No | |
| | Number (%) | Number (%) | Number (%) | Number (%) |
| Radio | 155 (49.7) | | 157 (50.3) | |
| Television | 6 (1.9) | | 306 (98.1) | |

4.3 Antenatal Care (ANC)

4.3.1 Use of antenatal care

Table 3 shows the percentage distribution of women who gave birth in the last three years preceding the study by selected characteristics. Of the total respondents, about a third (37.2%) reported receiving antenatal care during their current or last pregnancy. Use of antenatal care by age of the respondents showed that 74.6% of the women below 20 years age category reported to have used antenatal care services in the current or last pregnancy. This figure is substantially reduced to 48.6 percent and 1.8 percent for women in the age group 20-34 and 35-49, respectively.

In this study factors like education, having small number of children, earning better income and traveling less hours to reach to the nearest health facility are likely to have an effect on ANC service utilization by the respondents. In this regard findings showed that 66.7% of the women with secondary and above education and 64.1% of those with primary education have reported using ANC services as compared with the 37.5 percent and 22.1 percent of women who can read and write and the illiterate , respectively. Similarly, 53.2% of the women with less than 3 children have reported attending ANC services as compared with 33.7% of the women with 3 or more children Regarding the effect of income on ANC utilization, the result showed that 61.9% of women who earn greater than 1000 birr per month and 41.7% of those with average monthly income between 500-1000 birr, reported using ANC services during the current or their last pregnancy as compared with 21.9% women with less than 500 birr average monthly income. Moreover, more (45.2 percent) women who should travel less than 2 hours to reach to the nearest health facility reported attending ANC services as compared to the 17.6 % of those who should travel to 2-4 hours to reach the ANC service outlet (Table 3).

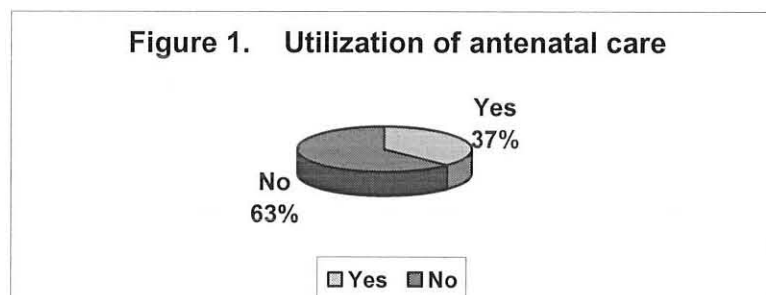


Table 3 Percentage distribution of women who are pregnant or had live birth in the last 3 years by use of ANC for the most recent birth by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

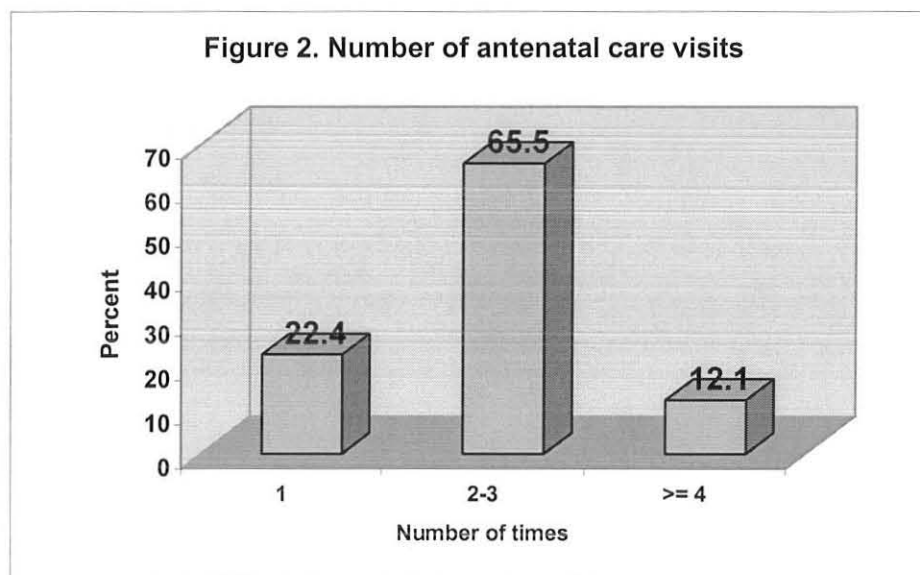
| Background characteristics | Use of ANC | | | |
|--|-----------------|--------|---------------------|--------|
| | Use ANC (N=116) | | Do not use (N= 196) | |
| | Number | (%) | Number | (%) |
| Age (N=312) | | | | |
| < 20 | 44 | (74.6) | 15 | (25.4) |
| 20 – 34 | 70 | (48.6) | 74 | (51.4) |
| 35 – 49 | 2 | (1.8) | 107 | (98.2) |
| Education (N=312) | | | | |
| Illiterate | 43 | (22.1) | 152 | (77.9) |
| Read and write only | 3 | (37.5) | 5 | (62.5) |
| Primary | 66 | (64.1) | 37 | (35.9) |
| Secondary & above | 4 | (66.7) | 2 | (33.3) |
| Average monthly income (N=312) | | | | |
| < 500 | 25 | (21.9) | 89 | (78.1) |
| 500 – 1000 | 65 | (41.7) | 91 | (58.3) |
| > 1000 | 26 | (61.9) | 16 | (38.1) |
| Children ever born (N=291) | | | | |
| Less than 3 | 74 | (53.2) | 65 | (46.8) |
| 3-5 | 25 | 30.9) | 56 | (69.1) |
| 6 and above | 2 | (2.8) | 69 | (97.2) |
| Average time taken to reach health facility (N=312) | | | | |
| Less than 2 hours | 100 | (45.2) | 121 | 54.8) |
| 2-4 hours | 16 | (17.6) | 75 | 82.4) |



4.3.2 Number of antenatal care visits

Antenatal care is more beneficial in preventing adverse pregnancy outcomes when it is sought early in the pregnancy and is continued through to delivery. In this study, of the 116 women who reported attending ANC service during the current or last pregnancy ,

about 22.4% reported making a single ANC visit while the majority (65.5 percent) reported making the visit for two to three times while, the remaining 12.1% reported making the visit for four or more times (Figure 2)



4.3.3 Timing of antenatal visits

Health professionals recommend that the first antenatal visit should occur within the first three months of pregnancy and continue on monthly basis through the 28th week of pregnancy and fortnightly up to the 36th week (or until birth). If the first antenatal visit is made at the third month of pregnancy and as regularly as recommended, there would be a total of at least 12 to 13 antenatal care visits. Under normal circumstances, WHO recommends that a woman without complications have at least four ANC visits to provide sufficient care (CSA and ORC Macro, 2006). In this study area, about, 23.3% of women reported making their first ANC visit before reaching the fourth month of their pregnancy and 37.1% make their visit between 4-5 months. The average months of pregnancy for the first antenatal care visit is 5.4 months (Table 4).

Table 4 Percentage distribution of women who are pregnant or had live birth in the last 3 years by time of the first ANC visit for the most recent birth, in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Number of months pregnant at time of first ANC visit | Number | (%) |
|--|-------------|--------|
| < 4 months | 27 | (23.3) |
| 4 – 5 months | 43 | (37.1) |
| 6 – 7 months | 30 | (25.9) |
| 8 and above months | 16 | (13.8) |
| Average months of pregnancy when starting ANC visit | 5.42 months | |

4.3.4 Access to health services

Access to health services in this study refers to the physical proximity to health institutions, which is assessed on the basis of the average time taken to reach the nearest health institution as reported by the respondents. The percentage distribution of women by the average time taken to reach the nearest health facility is presented in table 5. Accordingly, health post is found to be the nearest health facility for the majority of the respondents, 221 (70.8 percent) and could reach with less than two hours travel, followed by health centre and private clinic. The great majority (84.6 percent) of the respondents reported, as the travel to the nearest government hospital would take them more than 4 hours (Table 5). In the focus group discussions conducted in two kebeles most of the discussants said that the nearest health post is within one to two hours walking distance from their home.

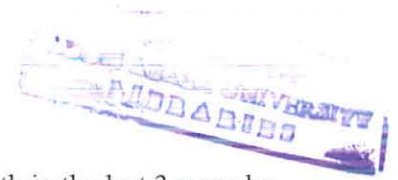


Table 5 Percentage distribution of women who had live birth in the last 3 years by the average time taken to reach the nearest health facility in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Average time taken to reach facility | Health Post | Health centre | Gov't hospital | Private clinic |
|--------------------------------------|-------------|---------------|----------------|----------------|
| | Number (%) | Number (%) | Number (%) | Number (%) |
| < 2 hrs | 221 (70.8) | 117 (37.5) | 1 (0.3) | 88 (28.2) |
| 2 – 4 hrs | 91 (29.2) | 142 (45.5) | 47 (15.1) | 146 (46.8) |
| > 4 hrs | 0.0 | 53 (17) | 264 (84.6) | 78 (25) |
| Total | 312 (100) | 312 (100) | 312 (100) | 312 (100) |

4.3.5 Reasons for not attending ANC

Women who reported not attending ANC service during the current or last pregnancy were asked about the reasons for not attending ANC services. Accordingly, about half of the women (51.5%) said they were in a state of good health, 15.5% reported that health services are too far and a further 12.9% said they had many responsibilities at home and a further 12.9% said waiting time to get services is too much and 11.3% indicated not aware about the benefit of ANC for not visiting the ANC services (Table 6). In the focus group discussions held in two kebeles most of the participants disclosed that they use the health services when they are in problem or when they fill sick. They believe that going to health facilities is not necessary for pregnant women unless she is sick. Women participants reported that they get antenatal care services free of charge. However, most of the discussants reported the existence of shortage of personnel, medicine and equipment, which usually force them to wait for long hours to get health services. Health extension workers who participated in the study were asked about number of health facilities and their overall adequacy to provide the necessary services to the population. Most of them revealed that the number of health facilities such as health posts currently available in the rural areas are not sufficient and equipped with

the required trained manpower, equipment and medicines. However, they disclosed that awareness of the community about the importance of antenatal care is gradually increasing.

Table 6 Percentage distributions of women who are pregnant or had live birth in the last 3 years for not attending ANC by reasons in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Reasons for not attending | Number | (%) |
|---------------------------------------|--------|--------|
| Not informed about ANC | 22 | (11.3) |
| Being in a state of good health | 100 | (51.5) |
| Health services are too far | 30 | (15.5) |
| Many responsibilities at home | 25 | (12.9) |
| Poor quality of Health facility | 12 | (6.2) |
| Waiting time too long to get services | 25 | (12.9) |
| Cost too much | 17 | (8.8) |
| Others | 2 | (1) |

4.3.6 Bivariate test for utilization of antenatal care

In this study, the relationship between the dependent variable utilization of antenatal care and selected demographic and socio-economic variables was examined using Chi-square test. As shown on table 7, 37.2% of the total respondents have used ANC services either during the current or their last pregnancies while 62.8% women did not use the ANC service. The Chi-square result depicted that women age is significantly associated with utilization of ANC with a P-value of less than 0.05 and Chi-square value of 101.7. Similarly, statistically significant association was observed between average monthly income and utilization of ANC services ($X^2=23.7$, $P=0.000$). Examining and average time taken to reach health facility, The Pearson Chi-square test of independence has also shown the existence of strong association between the total children ever born and utilization of ANC services ($X^2=53.4$, $P=0.000$) and

average time taken to reach health facility and utilization of ANC services ($X^2=21.1$, $P=0.000$). Education has also found to have statistically significant association with utilization of ANC ($X^2=50.9$, $P=0.000$). Further analysis of the Chi-square test showed the existence of significant association between marital status and utilization of ANC services ($X^2 = 7.9$, $P=0.005$) and between awareness of the benefits of ANC and utilization of ANC services ($X^2=12.2$, $P=0.000$). Child death experience also shows statistically significant association with utilization of ANC with Pearson Chi-square value of 25.1 and P-value 0.000. On the other hand, access to radio does not significantly associate with utilization of ANC at 5 percent level of significant (Table 7).

4.3.7 Multivariate analysis for utilization of antenatal care

In multivariate analysis binary logistic regression model was used to identify factors affecting utilization of antenatal care. As already discussed in chapter three it is applied when the dependent variable is dichotomous taking values 0 and 1 for non occurrence and occurrence of the event of interest, respectively. In this case, the dependent variable represents utilization of antenatal care (0=No and 1=Yes). The independent variables included in this analysis are age, average monthly income, total children ever born, average time taken to reach health facility, educational status, marital status, access to radio, awareness about benefit of ANC and child death experience.

Prior to conducting the analysis, the appropriateness of the model fitted was examined. Consequently, the Omnibus test of model coefficients given in the SPSS output demonstrates that the model chi-square is 140.96, which is significant at $P < 0.005$, and a statistical evidence for the presence of the relationship between the dependent variable and the combination of independent variables (CSA and CAZS, 2005).

In addition, to assess whether the model fits the data or not the Hosmer and Lemeshow goodness of fit test was run. Insignificant value of this test shows the goodness of the model. In this case, this test was run and a Chi-square value of 0.957 was obtained which is greater than P-value 0.05 that indicates the model has adequately fit the data (G. David Garson, 2006). Moreover, attempt has also been made to detect the degree of multicollinearity among the independent variables. Multicollinearity in the logistic regression model is detected by examining the standard errors, (S.E) for the Beta coefficient, (β coefficients). A standard error value larger/greater than 2.0 indicates numerical problems such as multicollinearity among the independents variables. None of the independent variables have a standard error greater than 2.0 and the model used did not suffer the problem of multicollinearity. Concerning predication the overall accuracy rate as computed by SPSS and shown on the classification table is 82.1% (CSA and CAZS, 2005).

show any effect on utilization of ANC. On the other hand, Married women are also less likely to use ANC than unmarried women (Table 8).

Table 8. Parameter estimates of logistic regression for the dependant variable, utilization of ANC with selected predictor variables in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Variables | B | S.E. | Sig. | Exp (B) (Odds ratio) |
|--|--------|-------|-------|-------------------------|
| AGE | | | | 1 |
| < 20 (RC) | | | | 1 |
| 20-34 | 3.876 | .965 | .000* | 48.218 |
| 35-49 | 2.783 | .826 | .001* | 16.164 |
| Total children ever born | | | | 1 |
| Less than 3 (RC) | | | | 1 |
| 3-5 children | .739 | .912 | .417 | 2.094 |
| 6 and above | .745 | .925 | .421 | 2.106 |
| Average monthly income in birr | | | | 1 |
| < 500 (RC) | | | | 1 |
| 500-1000 | -1.871 | 0.701 | .008* | .154 |
| > 1000 | -1.270 | 0.639 | .047 | .281 |
| Average time taken to the nearest health facility | | | | 1 |
| Less than 2 hrs (RC) | | | | 1 |
| 2 hours and above | -1.407 | .856 | .100 | 4.083 |
| Education | | | | 1 |
| Illiterate (RC) | | | | 1 |
| Literate | -.992 | .393 | .012* | .371 |
| Martial status | | | | 1 |
| Unmarried (RC) | | | | 1 |
| Married | -1.008 | .679 | .138 | .365 |
| Access to radio | | | | 1 |
| No (RC) | | | | 1 |
| Yes | -.185 | .402 | .646 | .831 |
| Awareness about benefit of ANC | | | | 1 |
| Not aware (RC) | | | | 1 |
| Aware | 1.468 | .595 | .014* | .230 |
| Child death experience | | | | 1 |
| No (RC) | | | | 1 |
| Yes | .714 | .496 | .150 | 2.042 |

Significant at *P value <0.05

RC= reference category

4.4 Delivery Care

4.4.1 Use of child delivery services

Percentage distribution of women by place of delivery and selected background characteristics is presented in table 9. The overwhelming majority of the births (85.2%) were delivered at home and 14.8% of the births were delivered in health facilities. A relatively larger proportion of women (8.2%) in the age group 20-34 reported delivering their last baby in health facilities as compared with women in the other age category. Similarly, women who have primary education delivered in health facilities accounted about 7.6% and relatively have larger proportion than illiterate women. Among households whose average monthly income is less than 500 birr, 34.7% delivered at home and only 2.4% delivered in health facilities. Concerning households that earn 500-1000 birr, 40.5% delivered at home and 9.3% delivered in health facilities. The proportion of women who have less than 3 children delivered in health facilities accounted about 10.7% and is relatively higher than women who have more than 2 children. About 13.4 % of women that travel less 2 hours to reach the nearest health facility delivered in health facility while only 1.4 % of women that travel more than 2 hours to reach the nearest health facility delivered in health facility (Table 9).

Table 9 Percentage distribution of women who had live birth in the last 3 years by place of delivery and selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Background characteristics | Place of delivery | | | | | |
|--|-------------------|--------|-------------------------|--------|--------|--------|
| | Home N=248 | | Health facility N=43 | | Total | |
| | Number | (%) | Number | (%) | Number | (%) |
| Age (291) | | | | | | |
| < 20 | 28 | (9.6) | 10 | (3.4) | 38 | (13.1) |
| 20 – 34 | 120 | (41.2) | 24 | (8.2) | 144 | (49.5) |
| 35 – 49 | 100 | (34.4) | 9 | (3.1) | 109 | (37.5) |
| Education (291) | | | | | | |
| Illiterate | 169 | (58.1) | 16 | (5.5) | 185 | (63.6) |
| Read and write only | 5 | (1.7) | 3 | (1) | 8 | (2.7) |
| Primary | 70 | (24.1) | 22 | (7.6) | 92 | (31.6) |
| Secondary and above | 4 | (1.4) | 2 | (0.7) | 6 | (2.1) |
| Average monthly Income (291) | | | | | | |
| < 500 | 101 | (34.7) | 7 | (2.4) | 108 | (37.1) |
| 500- 1000 | 118 | (40.5) | 27 | (9.3) | 145 | (49.8) |
| > 1000 | 29 | (10) | 9 | (3.1) | 38 | (13.1) |
| Children ever born (291) | | | | | | |
| Less than 3 | 108 | (37.1) | 31 | (10.7) | 139 | (47.8) |
| 3-5 | 73 | (25.1) | 8 | (2.7) | 81 | (27.8) |
| 6 and above | 67 | (23) | 4 | (1.4) | 71 | (24.4) |
| Average time taken to reach health facility (291) | | | | | | |
| Less than 2 hours | 162 | (55.7) | 39 | (13.4) | 201 | (69.1) |
| 2-4 hours | 86 | (29.6) | 4 | (1.4) | 90 | (30.9) |

4.4.2 Delivery attendant

Table 10 shows the type of assistance during delivery by selected background characteristics. The majority (61.8%) of the births were reported attended either by untrained traditional birth attendant and or by relatives, friends or neighbors. The remaining births, (38.2%) were delivered with the assistance of trained professionals like doctors, nurses, midwives or trained traditional birth attendant (TTBAs). Women in the age group 20-34 are more likely to be assisted by trained health professionals (8.2%) than other age groups. Untrained traditional birth attendants assisted about 26.5% illiterate women. Only 2.4% of households whose an average monthly income of less than 500 birr are reported being assisted by health professionals and those earn 500-1000 birr and greater than 1000 birr assisted by health professionals constitute about 10.7% and 3.1%, respectively. Percentage of women who were assisted by health professionals during delivery and travel less than 2 hours accounted about 13.7% and is relatively higher than women, (2.4%) who travel 2-4 hours to reach the nearest health facility (Table 10).

4.4.3 Reasons for home delivery

Table 11 presents percentage distribution of women who delivered at home by reasons to do so. Accordingly, of the 248 women who gave their reasons for delivering at home (85.4%) indicated that they delivered their last baby at home because it is their usual practice, 9.3% and 8.6% mentioned that health facility too far from home and not getting permission from husbands'/relatives' to give birth outside of their home as the reason for delivering at home, respectively. The poor quality of health services as the main reason for delivering at home was mentioned only by 2.8% of the mothers. In the focus group discussions conducted in Ancheru and Choresa kebeles most of the FGD discussants expressed their preference to deliver at home for convenience reason and they further disclosed that cost of delivery service is low. Moreover, the participants disclosed the presence of a traditional beliefs concerning delivery in their area. They stated that old women should get together in the pregnant women home one or two days before the expected day of delivery and pray. They believe that such ritual is important and will help the women to deliver a health baby without any complications. Most of the discussants also reported the existence of shortage of personnel, medicine and equipment, which usually force them to wait for long hours to get health services.

Table 11 Percentage distribution of women who had live birth in the last 3 years who delivered at home by reason in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Reasons for delivery at home | Number | (%) |
|-----------------------------------|--------|--------|
| Poor quality of health services | 7 | (2.8) |
| It is usual practice | 210 | (85.4) |
| Health facility too far from home | 23 | (9.3) |
| Husband/relative don't allow | 21 | (8.6) |
| Other reasons | 1 | (0.4) |

4.4.4 Bivariate test for utilization of child delivery services

Attempt was made to test the degree of relationship among the dependent variable, place of delivery and selected independent variables such as age, average monthly income, total children ever born, average time taken to reach health facility, education, marital status, access to radio and awareness about benefit of delivering in health facility, using Chi-square test of independence. Accordingly, the cross tabulation result of place of delivery with each independent variable shows that of the 248 of women who have had a history of delivery about (85.2%) delivered at home and about the remaining 14.8% delivered in health facilities. The Pearson Chi-square results showed that age ($X^2= 8.1$, $P=0.017$), average monthly income ($X^2=9.9$, $P=0.007$) and total children ever born ($X^2=12.5$, $P=0.002$) have statistically significant association with place of delivery at 5 percent level of significant. Moreover, average time taken to reach health facility ($X^2=11$, $P=0.001$) and education ($X^2=12.2$, $P= 0.000$) show statistically significant association with place of delivery. Access to radio ($X^2=6.9$, $P=0.008$) and awareness about the benefits of delivering in health facility ($X^2= 6.9$, $P=0.009$) have shown statistically significant association with place of delivery. On the other hand, marital status does not show statistically significant association with place of delivery (Table 12).

Table 12. Distribution of place of delivery by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February, 2009

| Variable | Place of delivery | | | | |
|--|-------------------|--------------------------|----------------|----------------|---------|
| | Home N=248 | Health facility N= 43 | Total N=291 | Chi- square | P-Value |
| | Number (%) | Number (%) | | | |
| Age | | | | (8.1) | 0.017* |
| Less than 20 | 28 (9.6) | 10 (3.4) | 38 | | |
| 20 -34 | 120 (41.2) | 24 (8.2) | 144 | | |
| 35 – 49 | 100 (34.4) | 9 (3.1) | 109 | | |
| Average monthly income (birr) | | | | (9.9) | 0.007* |
| Less than 500 | 101 (34.7) | 7 (2.4) | 108 | | |
| 500-1000 | 118 (40.5) | 27 (9.3) | 145 | | |
| Greater than 1000 | 29 (10) | 9 (3.1) | 38 | | |
| Total children ever born | | | | (12.5) | 0.002* |
| Less than 3 | 108 (37.1) | 31 (10.7) | 139 | | |
| 3-5 | 73 (25.1) | 8 (2.7) | 81 | | |
| 6 and above | 67 (23) | 4 (1.4) | 71 | | |
| Average time taken to reach health facility | | | | (11) | 0.001* |
| Less than 2 hours | 162 (55.7) | 39 (13.4) | 201 | | |
| 2-4 hrs | 86 (29.6) | 4 (1.4) | 90 | | |
| Education | | | | (12.2) | 0.000* |
| Illiterate | 169 (58.1) | 16 (5.5) | 185 | | |
| Literate | 79 (27.1) | 27 (9.3) | 106 | | |
| Marital status | | | | (1.8) | 0.179 |
| Unmarried | 28 (9.6) | 8 (2.8) | 36 | | |
| Married | 220 (75.6) | 35 (12) | 255 | | |
| Access to radio | | | | (6.9) | 0.008* |
| No | 117 (40.2) | 11 (3.9) | 128 | | |
| Yes | 131 (45) | 32 (10.9) | 163 | | |
| Awareness about benefit of health facility delivery | | | | (6.9) | 0.009* |
| Not aware | 45 (15.5) | 1 (0.3) | 46 | | |
| Aware | 203 (69.7) | 42 (14.5) | 245 | | |
| Child death experience | | | | (0.05) | 0.833 |
| No | 218 (74.9) | 30 (10.3) | 248 | | |
| Yes | 30 (10.3) | 13 (4.5) | 43 | | |

Significant at *P value < 0.05

4.4.5 Multivariate analysis for utilization of child delivery services

In multivariate analysis, binary logistic regression model was used to identify factors affecting utilization of institutional delivery. In this case, the dependent variable represents health facility delivery (0=No and 1 = yes). The independent variables included in this analysis are age, average monthly income, total children ever born, average time taken to reach health facility, education, marital status, access to radio and awareness about the benefit of health facility delivery. Based on the literatures reviewed, it is hypothesized that use of institutional delivery is mainly influenced by a combination of number of factors mentioned above.

In this analysis the appropriateness of the model fitted was also examined. Accordingly, the Omnibus test of model coefficient shows that the model Chi-square is 36.4 that is significant at ($P < 0.005$) and statistical evidence for the presence of the relationship between the dependent variable and the combination of independent variables (CSA and CAZS, 2005).

In addition, to assessing whether the model fits the data or not the Hosmer and Lemeshow goodness of fit test was run. Insignificant value of this test shows the goodness of the model. In this case, this test was run and a Chi-square value of 0.646 was obtained which is greater than P-value 0.05 that indicates the model has adequately fit the data (G.David Garson, 2006). Moreover, the standard errors for the β coefficients are less than 2.00, which show there is no problem of multicollinearity. Regarding predication, the over all accuracy rate is 87.1% (CSA and CAZS, 2005).

Table 13 shows the parameters of logistic regression using demographic and socio-economic variables with the dependent variable place of delivery. The result shows that women who have 3-5 children and those who have 6 and more children are 6 times and 2.4 times more likely to deliver in health facility than women who have less than 3 children, respectively. On the other hand, health facility delivery decreases by 78 percent for women whose average monthly income ranges between 500-1000 birr and

Table 13 Parameter estimates of logistic regression for the dependent variable, place of delivery with selected predictor variables in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Variable | B | S.E. | Sig. | Exp(B) (Odds ratio) |
|--|--------|------|-------|------------------------|
| AGE | | | | |
| < 20 (RC) | | | | 1 |
| 20-34 | .372 | .807 | .645 | 1.451 |
| 35-49 | -.290 | .690 | .674 | .748 |
| Total children ever born | | | | |
| Less than 3 (RC) | | | | 1 |
| 3-5 children | 1.793 | .884 | .043* | 6.007 |
| 6 and above | .899 | .870 | .301 | 2.458 |
| Average monthly income in birr | | | | |
| < 500 (RC) | | | | 1 |
| 500-1000 | -1.475 | .755 | .051 | .229 |
| > 1000 | -.112 | .576 | .846 | .894 |
| Average time taken to the nearest health facility | | | | |
| Less than 2 hrs (RC) | | | | 1 |
| 2 hours and above | -.438 | .863 | .612 | 1.549 |
| Education | | | | |
| Illiterate (RC) | | | | 1 |
| Literate | -.818 | .476 | .086 | .441 |
| Martial status | | | | |
| Not married (RC) | | | | 1 |
| Married | 1.641 | .649 | .011* | 5.160 |
| Access to radio | | | | |
| No (RC) | | | | 1 |
| Yes | -.989 | .480 | .039* | .372 |
| Awareness about use of health facility delivery | | | | |
| Not aware (RC) | | | | 1 |
| Aware | .114 | .626 | .855 | .892 |
| Child death experience (RC) | | | | |
| No | | | | 1 |
| Yes | .975 | .529 | .065 | .377 |

Significant at *P value < 0.05 RC= reference category

4.5 Use of Postnatal Care

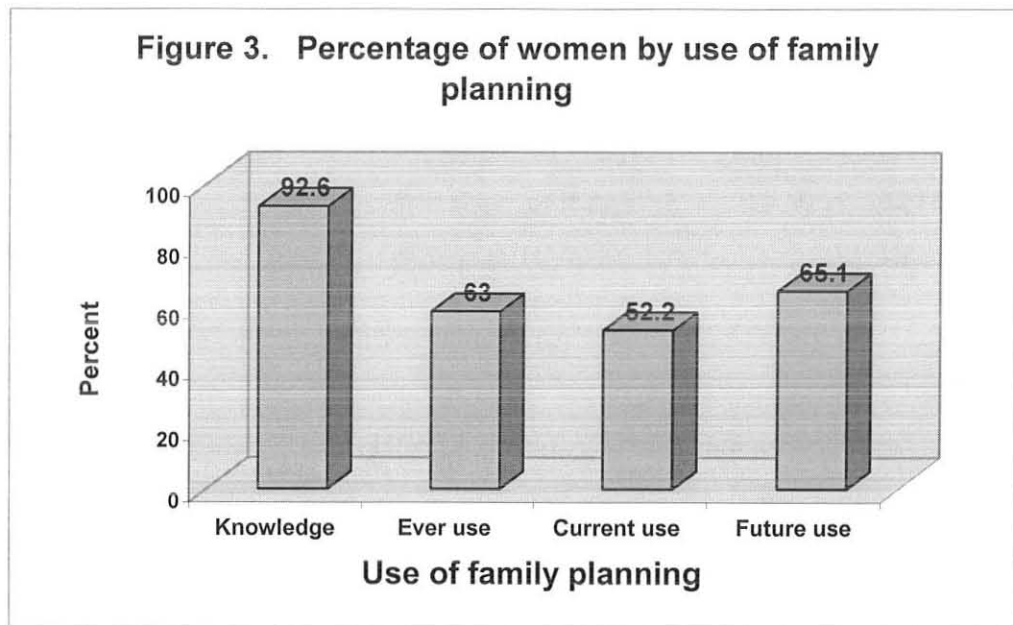
The percentage of women who have attended postnatal care in the study area is about 34.3%. The result shows that 56.5% of women who are less than 20 years have attended postnatal care. Likewise, among women who attended primary education 57.4% have attended postnatal care. Moreover, among women whose average monthly income is greater than 1000 birr 53.8% have attended postnatal care. Assessing use of postnatal care among women who have less than 3 children, a little more than half (52.2%) have attended postnatal care. Regarding women that travel less than 2 hours to reach the nearest health facility, 42% attended postnatal care (Table 18, annex I). In the focus group discussions participants reported that they use the health services when they are in problem or when they fall sick. Discussants also believe that it is not necessary for women to go to a health facility after delivery as far as the woman and her child are normal. Women participants reported that they get postnatal care services free of charge.

4.6 HIV/AIDS among women who have attended ANC

In the study area, knowledge of HIV/AIDS is widespread where about 86.9% of respondents have heard about HIV/AIDS. The respondents were also asked different questions to assess their level of awareness about how HIV transmits from mother to child and accordingly, 23%, 24.5%, 40.5%, 10.4% of respondents know that HIV could pass from mother to child during pregnancy, delivery, breast feeding and by all the three methods, respectively. Nearly a third (29.7%) of the respondents reported that HIV positive pregnant women can reduce the risk of HIV transmission to her baby by using certain medicines. Whereas, a little more than half (57.6%) of the study subjects believed that there are no medicines that can be used to reduce MTCT, while 12.6% do not have any idea at all. The study further revealed that 47.4% of those women who attended ANC reported to have checked their HIV status (Table 16, annex I).

4.7 Use of family planning

Figure 3 shows percentage of respondents about knowledge, ever use, current use and intention to use of family planning methods. Accordingly, about 92.6% of the respondents reported are aware of family planning methods, indicating high level of awareness about FP methods among the study community. Only (63%) of the respondents reported ever using contraceptive methods. All women who reported ever use of contraceptive methods were asked about their current use of contraceptive methods accordingly, about 52.2% mentioned that they are currently using contraceptive methods during the period of the study. Regarding future use of family planning among women who have knowledge of FP, 65.1% of women say that they intend to use a family planning method sometime in the future, 23.2% do not intend to use any method while 11.8% are unsure of their intention (Table 19, annex I).



4.7.1 Current use of family planning

The data revealed that out of the total 182 women who had ever used contraceptive methods, 95 women (52.2%) are currently using family planning methods. Current use of family planning by age, education, average monthly income, total children ever born and average time taken to reach health facility is presented in table 14. The contraceptive prevalence rate for women who are currently using a method of family planning and aged 20-34 is 53.7% and for those aged 35-49 is about 52.9%. Among women whose average monthly income ranges between 500-1000 birr about 50% are using contraceptive methods. Current use of family planning among women who have more than 6 children is about 59%. Among women who are currently using family planning and reported traveling less than 2 hours to reach the nearest health facility, 55% are using contraceptive methods. Moreover, women who are currently using contraceptive methods by family planning information provider, by contraceptive methods currently used and source or place of obtaining contraceptive methods currently used are presented in Tables 20, 21, 22, annex I, respectively.

Table 14 Percentage distribution of women who had live birth in the last 3 years and who are currently using family planning by selected background characteristics in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Background characteristics. | Currently using family planning | | |
|--|---------------------------------|--------------|-------------------|
| | Yes N=95 | No (N=87) | Total (N= 182) |
| Age | Number (%) | Number (%) | Number (%) |
| < 20 | 7 (41.2) | 10 (58.8) | 17 (100) |
| 20 – 34 | 51 (53.7) | 44 (46.3) | 95 (100) |
| 35 – 49 | 37 (52.9) | 33 (47.1) | 70 (100) |
| Education | | | |
| Illiterate | 59 (52.2) | 54 (47.8) | 113 (100) |
| Read and write only | 5 (71.4) | 2 (28.6) | 7 (100) |
| Primary | 28 (48.3) | 30 (51.7) | 58 (100) |
| Secondary & above | 3 (75) | 1 (25) | 4 (100) |
| Average monthly income | | | |
| < 500 | 34 (54) | 29 (46) | 63 (100) |
| 500 - 1000 | 47 (50) | 47 (50) | 94 (100) |
| > 1000 | 14 (56) | 11 (44) | 25 (100) |
| Children ever born | | | |
| Less than 3 | 43 (53.8) | 37 (46.2) | 80 (100) |
| 3-5 | 26 (47.3) | 29 (52.7) | 55 (100) |
| 6 and above | 26 (59.1) | 18 (40.9) | 44 (100) |
| Average time taken to reach health facility | | | |
| Less than 2 hours | 71 (55) | 58 (45) | 129 (100) |
| 2-4 hours | 24 (45.3) | 29 (54.7) | 53 (100) |

4.8 Decision making power of women

Table 15 shows the percentage of women who reported on who gives decisions on specific household issues. Accordingly, the result showed that the majority (77.6%) of the women reported that decisions on key issues like the purchase of clothes and main household items as well as on payment for health care for children and wife is often made by husbands alone. Similarly, about 43% of the respondents indicated that deciding on the use of family planning methods is the responsibility of their husbands alone. Whereas, about a third (32.7%) said that they jointly decide with their husbands on the use of family planning methods. Only 22.1% said that they give decision on such issues alone. The overall participation of women in decision-making showed that women have lower participation on decision-making in the study area. The lower participation of women in decision-making has strong impact on health of women and children that women would be denied essential health services. The lower percentage of antenatal care attendance and the overwhelming majority of births delivered at home have supported these findings (Table 15).

Table 15 Percentage distribution of women who are pregnant or had live birth in the last 3 years by participation in decision making on different issues in the household in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, 2009

| Decision | Wife only | Husband/ partner only | Wife and husband both jointly | Mainly relatives |
|---|------------|--------------------------|-------------------------------------|---------------------|
| | Number (%) | Number (%) | Number (%) | Number (%) |
| On purchase of clothes and main household items | 35 (11.2) | 242 (77.6) | 32 (10.3) | 3 (1) |
| On payment for health care for children & wife | 36 (11.5) | 242 (77.6) | 32 (10.3) | 2 (0.6) |
| On visit to relatives/friends | 37 (11.9) | 183 (58.7) | 58 (18.6) | 34 (10.9) |
| On use of family planning services & decision on number of children | 69 (22.1) | 136 (43.6) | 102 (32.7) | 4 (1.3) |
| On schooling of children | 39 (12.5) | 203 (65.1) | 68 (21.8) | 2 (0.6) |

Chapter Five

Discussion

This study has attempted to identify the main socio-economic and demographic factors that determine antenatal and delivery care utilization in rural kebeles of Kalu wereda, Debub Wollo Zone of Amhara region.

Antenatal care presents opportunities for reaching pregnant women with a number of interventions that may be vital to the health and well-being of the mothers and that of their infants. The early initiation of antenatal care is important to prevent and treat diseases like anemia and malaria, screen and treat syphilis and to identify and manage women with medical complications. It may provide the route for ensuring that pregnant women do in practice, deliver with the assistance of a skilled health care provider. More recently, the potential of the antenatal period as an entry point for HIV prevention and care, in particular for the prevention of HIV transmission from mother to child, has led to renewed interest in access to and use of antenatal care services (CSA and ORC Marco, 2006).

The study revealed that about 37.2% of women have attended antenatal care and 34.3% have attended postnatal care. It was identified that the majority of women have made only 2-3 ANC visits and most go for ANC check up in their late pregnancy. Moreover, the majority of births 85.2% are delivered at home and only 16.2% of the births are assisted by health professionals and 21% by trained traditional birth attendants. Similarly a study conducted in rural Western Kenya has shown that 80% of births were delivered at home and only 17% were attended by professional trained provider (Anna Mvan Eijk. et al, 2006). A study done in north Gonder Zone also confirmed that only 13.5% of all mothers gave birth in health facilities and the reported reasons were: absence of health problems, short duration of labor, preferring the attention of relatives and trust in traditional birth attendants. (Mesfin Nigussie. et al, 2004). Hence, the findings of this study are found to be consistent with other studies conducted in Ethiopia and other countries.

Antenatal care utilization is influenced by different factors like age, income, total children ever born, education, average time taken to reach health facility, marital status, access to radio, awareness about the benefit of ANC and child death experience. The result of the bivariate test between the dependant variable and key independent variables showed the effect of the above-mentioned independent variables with utilization of antenatal care. Accordingly, women's age is found to have significant association with utilization of ANC. This study shows that large proportion of women, below 35 years have made ANC visits and one explanation may be younger women are literate and are more likely to use modern health facilities than women aged 35 and above. A study done in Nepal and other developing countries showed that women older than 35 are less likely to make antenatal visits (Pradhan A, 2005).

Total number of children ever born and average time taken to reach health facility were also found to have strong association with utilization of ANC. In this study, women who have fewer than 3 children have attended ANC more than women who have 3 and more children. World Demographic and Health survey (DHS) on 45 developing countries showed that higher parity women less encountered antenatal care components (Pradhan A, 2005). Moreover, a study done in rural areas of India have shown a statistically significant reduction in proportion of women obtaining antenatal care services with increasing age, parity and number of living children (Nomita Chandhiok. et al, 2006). The findings of this study and other studies mentioned revealed that older women are reluctant to use health facilities such as ANC. Moreover, women who have fewer children are more inclined to use ANC because they are less experienced and will be afraid of abnormal conditions and delivery complications. Level of education and average monthly income have statistically significant association with utilization of ANC due to the fact that education is a key factor to increase awareness of women. Moreover, marital status, awareness about the benefit of ANC and child death experience have also shown statistically significant association to utilization of ANC.

Antenatal care utilization is also influenced by a combination of the above-mentioned factors. Accordingly, the multivariate analysis shows that average time taken to reach the nearest health facility has negative relationship, that is the longer women travel to reach health facility the lower the utilization of ANC as compared to women that travel less than 2 hours because it will be hard for a pregnant women to travel longer distances. Awareness about benefit of ANC shows positive relationship with utilization of ANC and it is statistically significant that women who are aware are willing and ready in advance to avoid adverse pregnancy outcomes. On the other hand, income does not show any effect on utilization of antenatal care since in the focus discussions women reported that they get ANC services free of charge.

On the other hand, the multivariate analysis shows that education has no effect in utilization of ANC may be in this study the number of women who have attended secondary and above education are very few. Level of education of the sampled women shows that 62.5% are illiterate and 37.5% are literate (33% have attended primary education, 2.6% can read and write and only very few women 6 (1.9%) have attended secondary and above). According to the 2005 EDHS result, well-educated women (secondary or higher) received professional antenatal care significantly higher than women with primary or no education. Percent of women who received antenatal care from health professional accounted for 22%, 39% and 81% for women with no education, who attended primary and secondary education, respectively (CSA and ORC Marco, 2006).

Among the various reasons given by the respondents for not attending antenatal care, being in a state of good health, health facilities are far from their home, waiting time too much to get the services, having many responsibilities at home and not aware about ANC were mentioned according to their order of importance. The result of the focus group discussions supplement this finding that pregnant women do not go for ANC check up unless they fall sick.



The main socio-demographic factors that affect the use of institutional delivery were also assessed in this study. The result of the bivariate test shows that age, average monthly income, total children ever born, average time taken to reach health facility, education, access to radio, awareness about the benefit of health facility delivery and child death experience show significant association with health facility delivery. A study done in North Gonder Zone, North West Ethiopia showed that maternal education and total children ever born have association with use of institutional delivery (Mesfin Nigussie. et al, 2004).

Moreover, the multivariate analysis shows that total children ever born, marital status and access to radio have statistically significant relationship with utilization of health facility delivery that unmarried women are less likely to delivery in health facility than married women because of lack of social acceptance. On the other hand, education here also shows negative relationship. As reported in EDHS 2005, percent of births assisted at delivery by a health professional accounted for 2%, 9% and 58% for women with no education, primary and secondary and higher, respectively (CSA and ORC Marco, 2006). Hence, significant difference is not observed between women with no education and those who attend primary education in the EDHS 2005 result.

In this study, information was also collected from women who deliver at home by reason. Accordingly, usual practice, health facility too far from home, husband/relatives do not allow and poor quality of health services were the main reasons according to their order of importance. In this regard, the qualitative information gathered from women and extension health workers in the focus group discussions and also the lower participation of women in decision-making have substantiated these findings.

Birth is an intense event that depends on traditional beliefs, personal preferences and views about reproduction and health. A number of studies observed that women were averse to using health professionals at birth because their practices did not correlate with local expectations. Methods of raising awareness about the benefits of

safe delivery should be sought, but services also need to be placed within a context acceptable to women and their families (Shelah S Bloom. et al, 1999).

Knowledge of women about HIV/AIDS is reported to be high in the study area, 86.9% which is consistent with EDHS findings which was 90% of the women are said to be aware of HIV/AIDS (CSA and ORC Marco, 2006). PMTCT programs provide for both prevention of HIV transmission from mother to child and enrolment of infected pregnant women and their families into antiretroviral treatment is an important method to mitigate the impact of the epidemic in the general population and amongst children in particular (HAPCO and MOH, 2007). Knowledge about MTCT of HIV among sampled women was about 25% (AED - linkages, 2004) in Amhara region and in this study it is almost the same (Annex II). Percentage of women testing for HIV during last pregnancy in Amhara region was 17% (AED, linkages, 2004) while in this study 47.4% have check for HIV during ANC which shows that activities of health facilities on PMTCT has increased and women are getting aware of the problem.

In most of the studies reviewed, knowledge of family planning is found to be high in Ethiopia and in this study also it is about 93%. However, current use of family planning was 16.1% in Amhara region (CSA and ORC Marco, 2006) and 28% (AED, linkages, 2004). In this study, it is found that 52.2% of women are currently using family planning. One explanation may be the increased in the activities of the government and non-government organizations in this area.

Research has shown that access to the radio and watching television can be powerful tools not only to create awareness about new technology but also to stimulate the desire for information and behavior change. Data from the two EDHS show that the percentage of households with a radio increased from 21 percent in 2000 to 34% in 2005 (CSA and ORC Marco, 2007). A study done in North Gonder showed that access to mass media (radio) is an important tool and was also shown to have an effect on the preference of institutional delivery (Mesfin Nigussie. et al,

2004). In this study it is shown that 34.9% of women listen to the radio almost every day and those who own radio are about 49.7%.

It is evident that women decision-making power has a significant effect on use of ANC and child delivery care services. However, Women participation in purchase of main household items, on health care, visit to relatives and decision on use of family planning has shown no improvement as compared to the findings obtained in EDHS 2005. A study done in north Gonder has shown that husbands are the main decision maker in health institution delivery of women (Mesfin Nigussie. et al, 2004). This study also revealed that husbands are still the main decision makers in the household.

The antenatal and postnatal coverage of Ethiopia has shown an increasing trend between 2002-2007 (MOH, 2007). Similarly an increasing trend was observed on antenatal, delivery, postnatal and family planning activities done by health facilities in Kalu Woreda from 2005 - 2008. This may be due to the implementation of health sector development plan (HSDP), which centered maternal and childcare as its main priority areas.

Finally, this study shows the importance of both demographic and socio-economic factors that affect the utilization of ANC and delivery care in rural kebeles of Kalu Wereda and most of these findings are consistent with previous studies done in Ethiopia and other parts of developing countries.

Chapter Six

Conclusion and Recommendations

6.1 Conclusion

The importance of maternal health care services in reducing maternal and infant mortality and morbidity has been understood. However, the level and trend of maternal health care service utilization are not well documented and the major obstacles to utilize these services are not identified in the study area. This study tries to identify different demographic and socio-economic factors that are barriers to antenatal and delivery care utilization in rural kebeles of Kalu Wereda.

The initiation, frequency and overall quality of antenatal care are important for timely identification and mitigation of potential complication of pregnancy. This study shows that utilization of ANC (37.2%) has shown an improvement than the 2005 EDHS (27%) of the amhara region. Number of ANC visits are found to be low that 65.5% of women make 2-3 times ANC visits through out their pregnancy. The median duration of pregnancy for the first antenatal visit is 5.4 months indicating that women in the area start antenatal care at a relatively late stage of their pregnancy.

An overwhelming majority of births were delivered at home and percentage of women who were assisted by health professionals is about 16.2%. Complications that do occur during delivery are mostly unpredictably and in sudden onset, requiring immediate action. Maternal and prenatal outcome in such conditions can be improved when such complications occur in the presence of professional attendant. Hence, provision of adequate medical attention during delivery is important for the well being of the mother and the child.

The number of women who are aware about HIV/AIDS have been found to be high and encouraging. On the other hand, knowledge about methods of mother to child transmission of HIV and number of pregnant women who checked for

HIV during ANC are reported to be low. Regarding family planning, knowledge of women is high but contraceptive use was found to be low indicating that still more has to be done.

This study indicates that radio is an important tool to disseminate information and it can be concluded that Health offices and concerned agencies should use radio to increase the awareness of the society on utilization of health services.

As it is shown in the bivariate and multivariate analysis, demographic and socio-economic factors affect antenatal and delivery care utilization in the study area. Most of the findings identified in this study, are similar to those findings in Africa and other developing countries. Hence, to bring sustainable improvement in reducing maternal and child mortality and morbidity, such type of studies are paramount important. Therefore, it can be concluded that such findings can be used as the basis for a number of recommendations.

6.2 Recommendations



- Kalu Wereda health office should: promote antenatal care, safe delivery and postnatal care services utilization by providing information about the importance of utilizing such services to women in the reproductive age group, their husbands and family members. The Wereda Health Office could utilize the existing health extension programs and community health workers like health extension workers, TTBAAs, community and religious leaders for the promotion activities.
- Promote identification and referral of risk pregnancies and facility based as well as safe home deliveries through community- based providers such as trained traditional birth attendants (TTBAAs) and health extension workers to insure safe deliveries for all women.
- Strengthen the promotion of family planning service to bring tangible change in attitude and practice of the community towards family planning.
- Promote empowerment of women through integrated community based activities such as establishment of micro-finance institutions, women associations and by encouraging girls and women education.
- Improve the quality of maternal care services in the health facilities located in the study wereda through provision of adequate number of trained health professionals, medicines and equipment to provide adequate and quality services to the society.
- This study revealed that radio is an effective means of media that may be used to disseminate health information to targeted audiences. Hence, health offices and concerned agencies should use radio to communicate health related message to the community and create awareness on utilization of health services.
- Similar studies should be encouraged to assess factors such as environmental and cultural factors that determine ANC and delivery service utilization in the

study area and among different communities in different parts of the country to help in designing programs and interventions that would help to alleviate the current problems and improve the use of antenatal and delivery care services.

References

Adamu YM and Salihu HM (2002) Barriers to the use of antenatal and obstetric care services in rural Kano, Nigeria. *J Obstet Gynaecol* 22:600-603.

Adeniran O. Fawole, FM COG(Nig), Michael A.Okunlola (2008) Clients' Perceptions of the Quality of Antenatal Care. *Journal of the National Medical Association*, Vol.100 No.9: 1052-1058.

AED-LINKAGES (2004) Prevention of Mother To Child Transmission (PMTCT). Baseline Survey, Ethiopia.

Anna Mvan Eijk, Hanneke M Bles, Frank Odhiambo, et al. (2006) Use of antenatal Services and delivery care among women in rural Western Kenya: a Community based Survey.

Anderson RM (1995) Revising the Behavioral Model and Access to Medical Care: does it matter. *J. Health Soc. Behav.* Vol. 36 (10)

Asmeret Mogos (2008). Correlates of Sexual Behavior among School Adolescents in Addis Ababa: A comparative study of Orphans and non-orphans, Un published MSc.Thesis, Institution of Population Studies, Addis Ababa.

Carolyn J Tann (2007). Use of antenatal Services and Delivery care in Entebbe, Uganda: a Community Survey.

Central Statistical Agency (2008) Summary and Statistical Report of the 2007 population and Housing Census. Addis Ababa

Central Statistical Agency and ORC Marco (2006) Ethiopia Demographic and Health Survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA.

Central Statistical Authority (1991) The 1990 Family and Fertility Survey preliminary Report. Addis Ababa, Ethiopia.

Central Statistical Authority, The 1994 Population and Housing Census of Ethiopia. Results at country Level . Vol. 1 Statistical Report. Addis Ababa, Ethiopia.

Central Statistical Agency and ORC Marco (2006), Marco International Inc.(2007). The Impact of Education on Health Outcomes. A new look at data from the 2005 Ethiopia Demographic and Health Survey Calverton, Maryland, USA.

CSA and ORC Marco (2006), Marco International Inc.(2007). Trends in Demographic and Reproductive Health Indicators in Ethiopia. Further analysis of the 2000 and 2005 Demographic and Health Surveys data, Macro International Inc. Calverton, Maryland USA.

Central Statistical Authority (2007) Annual Statistical Abstract. Addis Ababa.

Central Statistical Authority (2004) Welfare Monitoring Survey 2004. Analytical Report 339-A, Addis Ababa, Ethiopia.

CSA and Centre for Arid Zone Studies (2005) The Ethiopian Agricultural Sample Enumeration In-depth Analysis, Proceedings of a workshop 6 June 2005, Addis Ababa, Ethiopia.

Cochran W.G. (1977) Sampling Techniques third edition, Jon Wiley Sons inc. New York.

David G. Kleinbaum (1998) Logistic Regression, A Self-Learning Text. Statistics in the Health Sciences. New York.

David R Marsh, Gary L Darmstadt and Judith Moore (2002) Advancing Newborn health and Survival in Developing Countries: A Conceptual Framework. Washington Dc, USA.

Estela Rivero (2006) The effect of Family Access to Family Planning Services during Antenatal, Delivery and Postpartum Care on Contraceptive Use in the Postpartum period. Nicaragua, The Population Council.

Family Care International (2007) Testing Approaches for Increasing Skilled Care During Childbirth: Key Findings from Igunga District, Tanzania.

G. David Garson (2006) Logistic regression test handout.

Habtamu Zerihun (2008) Trends and Determinants of Utilization of Maternal Health Care Services in Amhara National Regional States, Evidence from EDHS 2000 and 2005, Un published MSc.Thesis, Institution of Population Studies, Addis Ababa

HAPCO and MOH (2007) Guidelines For Prevention of Mother-to-Child Transmission of HIV in Ethiopia. Addis Ababa.

Julie Pallant (2001) SPSS Survival Manual a step by step guide to data analysis using SPSS for Windows (version 10 and 11). New york, USA.

Kenya Demographic and Health Survey (2003) Analysis done by Maria Borda and William Winfrey, Futures/Constella, June 2006.

Koblinsky MA, Campbell O. Heichelheim J.(1999) Organizing delivery care: what works for safe motherhood? Bull World Health Organ, 77:399-406.

Magadi M, Madise N, Diamond I.(2001) Factors associated with unfavorable birth outcomes in Kenya. J Biosoc Sci, 33:199-255.

Mesganaw Fantahun (2001) Notes on MCH/RH For MPH Students. AAU Faculty of Medicine, Department of Community Health, Addis Ababa.

M.H. Rahman, W. Henry Mosley, Saifuddin Ahmed et. al, (2008) Does Service Accessibility reduce Socio economic Differentials in Maternal Care Seeking? Evidence From Rural Bangladesh. J.biosoc.Sci, 40, 19-33.

List of Annexes
Annex I

Table 16 Percentage distribution of women who had live birth in the last 3 years, who have Knowledge about HIV/AIDS and methods of MTCT of HIV in rural kebeles of Kalu wereda, Debub Wollo Zone, Amhara Region, February 2009

| Variable | Yes | No | Do not remember/know |
|--|------------|------------|----------------------|
| | Number (%) | Number (%) | Number (%) |
| Get information about HIV/AIDS | 271 (86.9) | 37 (11.9) | 4 (1.3) |
| Knowledge about MTCT of HIV | | | |
| During pregnancy | 62 (23) | | |
| During delivery | 66 (24.5) | | |
| During breast feeding | 109 (40.5) | | |
| By all the above three methods | 28 (10.4) | | |
| Do not know | | | 4 (1.5) |
| Medicine to avoid transmission of HIV to the child | 80 (29.7) | 155 (57.6) | 34 (12.6) |
| Checked for HIV during ANC | 55 (47.4) | 61 (52.6) | |

Table 17 Total number of women who got services on antenatal, delivery Postnatal care and family planning in kalu Wereda from 2005-2008.

| Programs/ Activities | Number of Women | | | | |
|-------------------------|-----------------|-------|-------|-------|-------|
| | 2005 | 2006 | 2007 | 2008 | Total |
| ANC | 2722 | 2729 | 3321 | 4032 | 12804 |
| Delivery care | 504 | 572 | 709 | 1100 | 2885 |
| Post natal care | 446 | 542 | 709 | 1656 | 3353 |
| Family planning | 17924 | 24048 | 28701 | 28617 | 99290 |

Table 19 Percentage distribution of women who had live birth in the last 3 years by Knowledge, Ever use, Current use and Future use of family planning

| Variable | Yes | No | Don't remember/ know |
|--------------------------------|------------|------------|-------------------------|
| | Number (%) | Number (%) | Number (%) |
| Knowledge of planning | 289 (92.6) | 23 (7.4) | |
| Ever use of family planning | 182 (63) | 107 (37) | |
| Current use of family planning | 95 (52.2) | 87 (47.8) | |
| Future use of family planning | 188 (65.1) | 67 (23.2) | 34 (11.8) |

Table 20 Percentage distribution of women who are pregnant or gave live birth in the last 3 years who got information about family planning by information provider.

| Information Provider | Number (289) | % |
|-------------------------|--------------|------|
| Health Professional | 44 | 15.2 |
| Radio | 7 | 2.4 |
| Relatives/friends | 17 | 5.9 |
| Community health worker | 34 | 11.8 |
| Health extension worker | 187 | 64.7 |

Table 21 Percentage distribution of women by contraceptive methods currently used.

| Contraceptive methods | Number (95) | % |
|-----------------------|-------------|------|
| Pills | 13 | 13.7 |
| IUD | 1 | 1.1 |
| Injectables | 67 | 70.5 |
| Implants | 1 | 1.1 |
| Condom | 1 | 1.1 |
| Lactation amenorea | 12 | 12.6 |

Table 22 Percentage distribution of women by most recent source /place of obtaining contraceptive methods currently used.

| Most recent source of method | Number (95) | % |
|------------------------------|-------------|------|
| Health Post | 74 | 77.9 |
| Health center | 14 | 14.7 |
| Government hospital | 2 | 2.1 |
| Private medical sector | 1 | 1.1 |
| Shops/friends/relatives | 4 | 4.2 |

Part I. Demographic and Socio- economic Characteristics of the Respondents

(For women who are 15 - 49 years and who are currently pregnant, who gave birth to at least one child in their life time and who have children less than or equal to 3 years)

| No. | Questions | Coding Categories | Skip | | | | |
|-----|--|--|---|--|--|--|--|
| 101 | What is your age? (in full years) | <table border="1" style="margin: auto;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> | | | | | |
| | | | | | | | |
| 102 | Can you read and write? | Yes, I can read and write = 1 Yes, I can read only = 2 No, I can't read and write = 3 | | | | | |
| 103 | Have you ever attended school? | Yes = 1 No = 2 | If no skip to Q 105 | | | | |
| 104 | What is the highest grade you have completed? | Grade <table border="1" style="margin: auto;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> Tech/Voc. Certificate = 2 University/College diploma = 3 University/College degree = 4 | | | | | |
| | | | | | | | |
| 105 | What is your Religion? | Orthodox = 1 Muslim = 2 Protestant = 3 Catholic = 4 Traditional = 5 Other specify _____ = 6 | | | | | |
| 106 | What is your Ethnicity? | Oromo = 1 Amhara = 2 Afar = 3 Tigray = 4 Other specify _____ = 5 | | | | | |
| 107 | What is your Occupation? | House wife = 1 Government employee = 2 Private sector employee = 3 Agriculture (farming, livestock) = 4 Private business (trading ..etc = 5 Other specify _____ = 6 | | | | | |
| 108 | What is your martial status? | Single = 1 Currently married = 2 Divorced = 3 Separated = 4 Widowed = 5 Living together = 6 | If answer is code 1 or 6 skip to Q 110 | | | | |
| 109 | How old were you when you first get married? (In full years) | <table border="1" style="margin: auto;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> | | | | | |
| | | | | | | | |
| 110 | What is the average monthly income of the family? | <table border="1" style="margin: auto;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> | | | | | |
| | | | | | | | |

| | | | |
|-----|-------------------------------|---------|---------|
| 111 | How many animals do you have? | TYPE | NUMBERS |
| | | Cattle | |
| | | Sheep | |
| | | Goats | |
| | | Equines | |
| | | Camels | |
| | | Poultry | |

Part II. Exposure to any form of media

| No. | Questions | Coding Categories | Skip |
|-----|---|---|---------------------|
| 201 | Do you have access to newspaper or magazines? | Yes = 1 No = 2 | If no skip to Q 203 |
| 202 | If the answer is Yes, how often do you read? | Almost every day = 1 At least once in a week = 2 Once in a month = 3 Others = 4 | |
| 203 | Do you own the radio? | Yes = 1 No = 2 | |
| 204 | How often do you listen to the radio? | Almost every day = 1 At least once in a week = 2 Once in a month = 3 Not at all = 4 Other Specify _____ = 5 | |
| 205 | Do you own television? | Yes = 1 No = 2 | |
| 206 | How often do you watch television? | Almost every day = 1 At least once in a week = 2 Once in a month = 3 Not at all = 4 Other Specify _____ = 5 | |

Part III. Birth History

| No. | Questions | Coding Categories | Skip |
|-----|---|--|----------------------|
| 301 | Do you have a child /children? | Yes = 1 No = 2 | If No skip to part 4 |
| 302 | What was your age at first birth? (in full years) | <input type="text"/> <input type="text"/> | |
| 303 | How many children have you ever born? | <input type="text"/> <input type="text"/> | |
| 304 | How many of the children are alive? | <input type="text"/> <input type="text"/> | |
| 305 | How many of the children are not alive/dead? | <input type="text"/> <input type="text"/> | |
| 306 | Age of your last child | <input type="text"/> <input type="text"/> Year <input type="text"/> <input type="text"/> Months | |
| 307 | Last birth interval (For women who have 2 or more children) | <input type="text"/> <input type="text"/> Year <input type="text"/> <input type="text"/> Months | |
| 308 | What was your age when you give birth to your last child? (In full years) | <input type="text"/> <input type="text"/> | |
| 309 | How many children do you have with age 3 and less than 3 years old? | <input type="text"/> | |

Part IV . Antenatal Care

| No. | Questions | Coding Categories | skip |
|-----|--|--|------------------------------|
| 401 | Are you Pregnant now? | Yes = 1 No = 2 Unsure = 3 | If code 2 & 3 Skip to Q. 403 |
| 402 | How many months pregnant are you? | Months <input type="text"/> <input type="text"/> | |
| 403 | Have you attended the ANC checkup during your last/ current pregnancy? | Yes = 1 No = 2 Do not know = 3 | If no skip to Q 418 |

| | | | |
|-----|--|--|--|
| 404 | What is the benefit of ANC follow up? | Good for the health of the mother = 1 Good for the health of the child = 2 Good for both mother and Child = 3 Do not know = 4 Other specify ----- = 5 | |
| 405 | Whom did you visit for the current pregnancy / during your last pregnancy? | Health Professional = 1 Trained trad. Birth Attendant = 2 Untrained trade. Birth Attendant = 3 Comm. Health Agent = 4 Do not know = 5 Other specify ----- = 6 | |
| 406 | Where did you receive antenatal care for current / last pregnancy? | Home = 1 Health post = 2 Health center = 3 Hospital = 4 Private clinic = 5 Other specify = 6 | |
| 407 | Why did you prefer that service provider? (multiple answers are possible) | It is close to my home/village = 1 Service is free of charge = 2 Less waiting time = 3 Service providers are good caring = 4 Husband recommends = 5 Recommendation by friends / family members of her = 6 Others specify = 7 | |
| 408 | Why did you decide to follow ANC ? | To check my health = 1 To check the health of my baby = 2 I had problem during last pregnancy/delivery and wanted the same thing not to happen again = 3 To check my health and my baby = 4 Other specify = 5 | |
| 409 | How many months pregnant were you when you first received antenatal care for this pregnancy/ last pregnancy? | Months <input type="text"/> <input type="text"/> Do not remember = 98 | |
| 410 | How many times did you visit the ANC service outlet during this pregnancy / last pregnancy | Number of times <input type="text"/> <input type="text"/> Do not remember = 98 | |
| 411 | During your ANC follow up did you get tetanus injection? | Yes = 1 No = 2 Do not remember = 3 | |
| 412 | During your ANC follow up were you told about pregnancy and delivery complications by the health workers? | Yes = 1 No = 2 Don't remember = 3 | |
| 413 | During the current pregnancy/ last pregnancy did you use bed net to protect you from getting Malaria? | Yes = 1 No = 2 Do not remember = 3 | |
| 414 | During the current pregnancy/ last pregnancy did you take any drugs (Iron/Folate) tablet? | Yes = 1 No = 2 Do not remember = 3 | |

| | | | | | | | |
|---------|--|--|--------------------------------------|--|--|--|--|
| 415 | During your last ANC visit how long have you waited to receive the services? (Time in minutes or hours) | <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> Do not know = 98 | | | | | |
| | | | | | | | |
| 416 | During your recent ANC visit were you satisfied with the service provided in health facility ? | Satisfied = 1 Not satisfied = 2 Do not know = 3 Other specify _____ = 4 | If answer is code 1 or 3 skip to 419 | | | | |
| 417 | If you are not satisfied, what are the main reasons? | Quality of care is poor = 1 Waiting time is too long = 2 Cost is too much = 3 Neat ness of the equipment is poor = 4 Other specify _____ = 5 | | | | | |
| 418 | If the answer for Q 403 is No, why didn't you attend ANC ? (multiple answers are possible) | I was not informed about ANC = 1 I was in a state of good health = 2 The health facility that provide the service are too far from my home = 3 I had work load at home = 4 I am not happy about quality of health services = 5 Waiting time in the health facility is too long = 6 The service fee / cost is beyond My paying capacity (cost is too much) = 7 Other specify _____ = 8 | | | | | |
| 419 | Do you believe that pregnant women should get antenatal care follow up? | Yes = 1 No = 2 Do not know = 3 | | | | | |
| 420 | How much is the average time would it take you to reach to the facility listed below? | | | | | | |
| | Type of facility | Hours | Minutes | | | | |
| 420 - A | Health Post | | | | | | |
| 420 - B | Health Center | | | | | | |
| 420 - C | Hospital | | | | | | |
| 420 - D | Private Clinic | | | | | | |

Part V. Delivery care
(For women who gave birth at least one child in their lifetime)

| No. | Questions | Coding Categories |
|-----|--|---|
| 501 | Where did you deliver your last baby? (For women who gave birth to at least one child in their life time) | Home = 1 Health post = 2 Health center = 3 Hospital = 4 Private clinic = 5 Other specify _____ = 6 |

| | | |
|-----|--|--|
| 502 | Why did you prefer to deliver in health institution? (For those women who deliver their last child at health facility for) (multiple answers are possible). | I was informed to deliver at health facilities = 1 I had faced a problem During labor/delivery = 2 It was my usual practice = 3 Close to my place of residence = 4 Availability of better Quality services = 5 Lower expense = 6 Other specify _____ = 7 |
| 503 | If you deliver at home, why did you prefer to deliver at home? For those women who deliver their last child at home) (Multiple answers are possible) | I am not happy with the Poor quality of the service = 1 Cost too much for me to offer = 2 If is my usual practice = 3 Health facility is too far from home = 4 Husband/relatives do not allow = 5 Other specify _____ = 6 |
| 504 | Who assisted you with the delivery? | Health professional = 1 TTBA = 2 Untrained TBA = 3 Community health agent = 4 Relative/friend = 5 Other specify _____ = 6 |
| 505 | How long was the duration of labour? | <input type="text"/> <input type="text"/> Do not remember = 98 |
| 506 | Have you faced any complications during the delivery of your last child? | Yes = 1 No = 2 |
| 507 | What was the outcome of your last pregnancy? | Still birth = 1 Abortion = 2 Live baby = 3 Other specify _____ = 4 |
| 508 | Was the delivery normal? | Yes = 1 No = 2 |
| 509 | Do you think that institutional delivery has any benefit? | Yes = 1 No = 2 |

Part VI. Postnatal care

| No. | Questions | Coding Categories | |
|-----|--|--|--|
| 601 | Have you ever heard about postnatal care services? | Yes = 1 No = 2 | |
| 602 | Do you believe that, after delivery women should get postnatal care? | Yes = 1 No = 2 | |
| 603 | Where did you hear about it? (Multiple answers are possible) | From health institution during delivery = 1 From media (Radio, TV, news paper) = 2 From friends/relatives = 3 Other specify _____ = 4 | |

| | | | |
|-----|---|---|--------------------|
| 604 | Did you attend postnatal care services after the delivery of your last child? (For women who gave birth at least to one child) | Yes = 1 No = 2 | If no skip to Q609 |
| 605 | Who checked on your health at that time? | Health professional = 1 TTBA = 2 Untrained traditional birth attendant = 3 Community health worker = 4 Other specify = 5 | |
| 606 | Where did this check take place? | Home = 1 Health post = 2 Health center = 3 Hospital = 4 Private clinic = 5 Other specify = 6 | |
| 607 | How many times did you visit the services for postnatal care? | Number of times <input type="text"/> <input type="text"/> Do not remember = 98 | |
| 608 | Why did you attend postnatal care? (multiple answers are possible) | Good for the health of the mother = 1 Good for the health of the child = 2 Good for both mother and Child = 3 Do not know = 4 Other specify = 5 | |
| 609 | If the answer for Q 604 is No why did not you attend postnatal care? (Multiple answers are possible) | There was no problem after delivery = 1 My husband/ relatives do not allow me to attend = 2 I had no idea about postnatal care = 3 Health facility is too far = 4 Cost is too much = 5 Other specify _____ = 6 | |

Part VII. Preventing mother- to-child transmission of HIV (PMTCT)

| No. | Questions | Coding Categories | Skip |
|-----|---|--|---------------------------|
| 701 | During your last pregnancy, did you receive any information about HIV/AIDS? | Yes = 1 No = 2 Do not remember = 3 | If code 2or 3 skip to 703 |
| 702 | If answer is Yes, from where did you get the information? | From health professional = 1 Radio = 2 Television = 3 News paper and magazines = 4 Relatives / friends = 5 Community health worker = 6 Other specify _____ = 7 | |

| | | | |
|-----|--|---|------------------------------------|
| 703 | Can HIV be transmitted from mother to her child? | Yes = 1 No = 2 Do not Know = 3 | If code 2 or 3 skip to Q 706 |
| 704 | How can HIV be transmitted from mother to child? | During pregnancy = 1 During delivery = 2 During breastfeeding = 3 By all the above 3 ways = 4 Do not Know = 5 | |
| 705 | Are there any special medication that health professionals can give to a women infected with HIV to prevent the transmission of HIV to the baby? | Yes = 1 No = 2 Do not Know = 3 | |
| 706 | During the current / last pregnancy were you asked to test for HIV? | Yes = 1 No = 2 Do not Know = 3 | If answer is No skip to part 8 |
| 707 | Have you checked for HIV during your last pregnancy? | Yes = 1 No = 2 Do not remember = 3 | If answer is 2 or 3 skip to part 8 |
| 708 | I will not ask you about the result but did you know the result? | Yes = 1 No = 2 Do not Know = 3 | |

Part VIII. Attitude on Maternal Care

| No. | Questions | Coding Categories | Skip |
|-----|--|---|---------------------------|
| 801 | Do you have a preferred place to deliver your child? | Yes = 1 No = 2 | |
| 802 | Where do you prefer to deliver your child? | At home = 1 At government health services = 2 At private health services = 3 Other specify _____ = 4 | If at home skip to Q. 804 |
| 803 | Why do you prefer to deliver your child at health facility you mentioned (multiple answers are possible) | It is my usual practice = 1 I was told to delivered at health facilitY when I follow antenatal care = 2 Because my husband /partner allow me to deliver at health facility.... = 3 For my child health = 4 For mothers health = 5 Both for my child & my health = 6 Other specify _____ = 7 | |
| 804 | Why do you prefer to deliver at home? | It is my usual practice = 1 | |

| | | |
|--|--|--|
| (For women who mentioned home as their preferred place to deliver a child) | I am afraid about the safety of materials they used. = 2 Health services are far from my home = 3 Cost is too much = 4 Because my husband /partner do not allow me = 5 Other specify _____ = 6 | |
|--|--|--|

Part IX. Family Planning / Contraception

| No. | Questions | Coding Categories | Skip |
|-----|---|---|---------------------------|
| 901 | Were you ever told about family planning and contraceptive methods that you could use ? | Yes = 1 No = 2 Do not remember = 3 | |
| 902 | If answer is Yes, from where did you get the information? | From health professional = 1 Radio = 2 Television = 3 News paper and magazines = 4 Relatives / friends = 5 Community health worker = 6 Health extension worker = 7 Other specify _____ = 8 | |
| 903 | Have you ever used anything or tried in any way to delay or avoid getting pregnant? | Yes = 1 No = 2 Do not Know = 3 | If code 2/3 skip to Q 907 |
| 904 | Are you currently doing something or using any method to delay or avoid getting pregnant? | Yes = 1 No = 2 Do not Know = 3 | If code 2/3 skip to Q 907 |
| 905 | Which method are you using? | FEMALE STERILIZATION 1 MALE STERILIZATION 2 PILL 3 IUD 4 INJECTABLES 5 IMPLANTS 6 CONDOM 7 DIAPHRAGM/FOAM/JELLY 8 LACTATIONAL AMEN Method 9 RHYTHM METHOD 10 WITHDRAWAL 11 Other specify _____ 12 | |

| | | | |
|-----|---|--|--|
| 906 | Where did you obtain (CURRENT METHOD) the last time? | Health Post = 1 Health Center = 2 Hospital = 3 Non-Gov't health facility = 4 Private medical sector (Private hospital/clinic) = 5 Pharmacy = 6 Other sources(Shop, friends/relatives) = 7 Other Specify = 8 | |
| 907 | Do you think you will use a contraceptive method to delay or avoid pregnancy at any time in the future? | Yes = 1 No = 2 Do not Know = 3 | |

Part X . Decision making power of women (for women who are currently married or live together)

| | | | |
|------|--|---|--|
| 1001 | Who mostly decide on purchase of clothes and main household items? | Me / Mainly respondent = 1 Mainly husband/partner = 2 Both (husband & wife) = 3 Jointly = 4 Mainly relatives = 4 Do not know = 5 | |
| 1002 | Who usually make decisions on paying for health care for you and your children? | Me / Mainly respondent = 1 Mainly husband/partner = 2 Both jointly (husband/partner and wife) = 3 Mainly relatives = 4 Do not know = 5 | |
| 1003 | Who make decisions on visits to your family / relatives or friends? | Me / Mainly respondent = 1 Mainly husband/partner = 2 Both jointly (husband/partner and wife) = 3 Mainly relatives = 4 Do not know = 5 | |
| 1004 | Who make decisions on use of family planning services and number of children you want to have? | Me / Mainly respondent = 1 Mainly husband/partner = 2 Both jointly (husband/partner And w ife) = 3 Mainly relatives = 4 Do not know = 5 | |
| 1005 | Who make decisions on schooling of children and activities done by them? | Me / Mainly respondent = 1 Mainly husband/partner = 2 Both jointly (husband/partner and Wife) = 3 Mainly relatives = 4 Do not know = 5 | |