Determinants of Antenatal Care, Institutional Delivery and Skilled Birth Attendant Utilization in Samre Saharti District, Tigray, Ethiopia

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<tr>
<td>AIDS</td>
<td>Acquire immune deficiency syndrome</td>
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<tr>
<td>ANC</td>
<td>Antenatal care</td>
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<tr>
<td>ARI</td>
<td>Acute respiratory infection</td>
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<td>ART</td>
<td>Anti retroviral therapy</td>
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<tr>
<td>BCC</td>
<td>Behavioral change communication</td>
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<tr>
<td>CBNs</td>
<td>Community based nutrition agents</td>
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<tr>
<td>CBRHAs</td>
<td>Community based reproductive health agents</td>
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<td>CHWs</td>
<td>Community health workers</td>
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<tr>
<td>CMR</td>
<td>Child mortality rate</td>
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<tr>
<td>DHO</td>
<td>District health office</td>
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<td>EDHS</td>
<td>Ethiopian demographic health survey</td>
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<td>EmOC</td>
<td>Emergency obstetric care</td>
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<tr>
<td>FGM</td>
<td>Female genital mutilation</td>
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<td>FMoH</td>
<td>Federal Ministry of Health</td>
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<td>FP</td>
<td>Family planning</td>
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<td>GNP</td>
<td>Gross national product</td>
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<tr>
<td>HC</td>
<td>Health center</td>
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<td>HEP</td>
<td>Health extension program</td>
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<td>HEW</td>
<td>Health extension worker</td>
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<tr>
<td>HF</td>
<td>Health facility</td>
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<td>HIV</td>
<td>Human immunodeficiency virus</td>
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<tr>
<td>HMIS</td>
<td>Health management information system</td>
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<td>HP</td>
<td>Health post</td>
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<td>HSDP III</td>
<td>Health sector development plan three</td>
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<tr>
<td>HW</td>
<td>Health worker</td>
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<tr>
<td>IEC</td>
<td>Information education communication</td>
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<tr>
<td>IMR</td>
<td>Infant mortality rate</td>
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<tr>
<td>ITNs</td>
<td>Insecticide treated nets</td>
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<tr>
<td>MASL</td>
<td>Meters above sea level</td>
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<td>MDGs</td>
<td>Millennium development goals</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>MMR</td>
<td>Maternal mortality rate</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
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<tr>
<td>OPD</td>
<td>Outpatient department</td>
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<td>PALWA</td>
<td>People living with HIV/AIDS</td>
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<td>PHC</td>
<td>Primary health care</td>
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<tr>
<td>PMTCT</td>
<td>Prevention of mother to child transmission</td>
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<td>RH</td>
<td>Reproductive health</td>
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<td>STIs</td>
<td>Sexual transmitted infections</td>
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<td>TB</td>
<td>Tuberculosis</td>
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<td>TBAs</td>
<td>Traditional birth attendants</td>
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<tr>
<td>TRHB</td>
<td>Tigray regional health bureau</td>
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<tr>
<td>UN</td>
<td>United nations</td>
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<tr>
<td>UNFPA</td>
<td>United nations population fund agency</td>
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<tr>
<td>UNICEF</td>
<td>United nations children fund</td>
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<tr>
<td>VCT</td>
<td>Voluntary counseling and testing</td>
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<td>WHO</td>
<td>World health organization</td>
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Abstract

Background: The World Health Organization (WHO) estimates that about 536,000 women of reproductive age die each year from pregnancy related complications. Nearly all of these deaths (99%) occur in the developing world. Ethiopia in one of the countries with an unacceptably high maternal mortality, 673/100000 live births, one of the highest in the world. In Ethiopia where 85% of the population lives in rural areas, availability of health services, especially maternal health care services, is extremely difficult. Overall, access for maternity care is on average 23% for rural and 52% for urban areas. Studies addressing determinants of maternity care services utilization in the country are scarce, and these studies have been mainly focused on urban areas and health centers and hospitals.

Objective: This study was aimed to explore the trends and magnitudes of antenatal, institutional delivery and skilled birth assistance utilization and to identify determinants for selection of this service in Saharti Samre district, Tigray, Ethiopia.

Method: The study combined both quantitative and qualitative methods. The quantitative study was a community-based cross-sectional survey using a structured questionnaire. Cluster sampling technique was utilized to select the study subjects who were mothers who gave birth once in the past five years prior the survey period. For the qualitative study focus group discussions (FGDs) was chosen as the tool for data collection. The participants were purposely selected from different kebeles and kushets. Four FGDs (two with men and two with women) were conducted.

Results: A total of 1113 women participated in the quantitative survey. The proportion of women who received antenatal care for their recent births was 54%. Only 4% of mothers gave birth for their recent child in the health facility and only 6% mothers were assisted by skilled birth attendants. Education, parity, family education, history of obstructed labor and ANC visit were significant predictors for the selection of delivery place. Regarding skilled assistance education and family education was found significant predictors. Similarly education and marital status were significant factors for use of ANC utilization. The FGDs identified economic constraints, transport problems, inaccessibility of health facilities, lack of decision making power, cultural and traditional practices as important predictors for seeking of maternal health care.
Conclusion: This study confirmed that the proportion of antenatal care, institutional delivery and skilled birth attendant utilization were very low. Economical, health facility related and socio-cultural factors were the most frequently identified contributors to the low maternal health care utilization. More effort should be given to educate mothers, to improve men involvement and religious leaders, to strengthen community participation, to increase political commitment and to boost accessibility to maternal health care services. Emphasis should also be given to capacity building for skilled birth attendants and HEWs. TBAs are still highly accepted by communities and therefore TBAs‘ role should be reassessed and motivated.
1. Introduction

The World Health Organization (WHO) estimates that about 536,000 women of reproductive age die each year from pregnancy related complications (WHO, 2008). Nearly all of these deaths (99%) occur in the developing world (WHO, 2005). These deaths are almost equally divided between Africa (251,000) and Asia (253,000), with about 4% (22,000) occurring in Latin America and the Caribbean and less than 1% (2,500) in the more developed regions of the world. Maternal mortality rate also shows the same disparity among regions (Figure 1). The world figure is estimated to be 400 per 100,000 live births. It is higher in Africa (830), followed by Asia (330), Oceania (240), Latin America and the Caribbean (190), and at the bottom the developed countries (20) (AbouZahr, 2003). Globally, at least 160 million women become pregnant annually. Of these, 15% develop a serious complication. Over 30 million women in the developing world suffer from serious diseases and disabilities which include uterine prolapsed, pelvic inflammatory disease, fistula, incontinence, infertility, and pain during sexual intercourse as a result of inadequate or inappropriate care during pregnancy, delivery or the first critical hours after birth (WHO, 2005).

In addition to the above consequences, maternal death has also an impact in the health and well-being of families, communities and in general in the social and economic situation of the societies. Each year an estimated US $15.5 billion is lost in potential productivity when mothers and newborns die (WHO 2005). When a woman dies in childbirth, her infant and any other children’s survival is threatened. Infants without mother are more likely to die within two years. Children up to 10 years whose mothers die are 3 to 10 times more likely to die within two years than children living with mothers. Every year an additional 2 million children worldwide are maternal orphans (WHO, 2005). Maternal death¹ has long term effects on a child’s education and health. When a mother dies, older children often leave school to support their family. Children without a mother are less likely to be immunized, and are more likely to suffer from malnutrition (WHO, 2005).

¹ Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental (WHO, 2005).
1.1. International initiatives on maternal health

Reduction of maternal mortality has been a common goal to several international conferences in particular, the Nairobi Safe Motherhood Conference in 1987, the World Summit for Children in 1990, the International Conference on Population and Development in 1994 and the Fourth World Conference on Women in 1995 (Cham, 2003).

Safe Motherhood Initiative was to draw attention to the dimensions on the consequences of poor maternal health in developing countries, and to mobilize action to address the high rates of deaths and disability (UNFPA, 2005). Safe Motherhood Strategies (SMS) were developed based on pregnancy, antenatal, delivery and the postpartum periods. The specific activities include the provision of antenatal care, skilled assistance for normal deliveries, appropriate referral for women with obstetric complications, postnatal care, family planning and other reproductive health services. The four basic principles or pillars of the Safe Motherhood Strategy are:

1. Family planning: providing information and services.
3. Clean and safe delivery: providing trained skilled birth attendants and equipment.
In addition the above activities, training of traditional birth attendants (TBAs), community health workers and provision of clean delivery kits to promote clean home deliveries and strengthening linkages between different levels of health facilities and the community are also considered key strategies to reduce maternal mortality.

1.2. The achievements and challenges of motherhood strategies

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

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

1.3. MDG as a framework for global strategies to reduce maternal mortality

The Millennium Development Goals (MDGs) were adopted by the international community at the United Nations Millennium Summit in 2000. The political commitment was renewed at the September 2005 World Summit and strengthened in 2006 with the additional target of universal access to reproductive health. Therefore, it is imperative to adopt an integrated approach to reproductive health and donors have offered significant assistance for resources to support those activities (UNFPA, 2006).

ii Skilled attendant: an accredited health professional – such as a midwife, doctor or nurse – who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns (WHO, 2005).
The MDG5, the corner stone of the strategy to improve maternal health, includes two targets:

- To reduce maternal mortality by three quarters between 1990 and 2015
- To achieve universal access to reproductive health by 2015

Progress towards achieving the MDGs is monitored with a framework of measurable targets for each MDG. Achieving the MDG5 requires reducing maternal mortality at a much faster rate in the future than it was reduced between 1990 and 2005. According to the WHO 2005 report, in 56 of the 68 priority countries where 98% of maternal deaths occur, mortality ratios are still high, exceeding 300 maternal deaths per 100,000 live births. The global maternal mortality ratio is 400 maternal deaths per 100,000 live births versus 430 in 1990. This average annual decrease of less than 1% is far below the 5.5% annual decline that is required to achieve the MDG5. At the regional level, none of the MDGs priority regions have achieved a 5.5% annual decline; eastern Asia comes close with a 4.2% and in sub-Saharan Africa, the annual decline has been 0.1% (WHO, 2005).

Regarding the second target, increasing deliveries assisted by skilled attendance is one of the indicators of progress towards MDG5. The proportion of births in low- and middle-income countries assisted by a skilled birth attendant increased from 47% in 1990 to 61% in 2006 (WHO, 2005). The regions with the lowest proportions of skilled health attendants at birth were eastern Africa (34%), western Africa (41%) and south-central Asia (47%), which also had the highest numbers of maternal deaths (WHO, 2005). In every region, the presence of skilled birth attendants is lower in rural than in urban areas (UN, 2005).

The current number of skilled attendants is critically insufficient. An estimated 700,000 midwives are needed worldwide to ensure universal coverage with maternity care, but there is currently a 50% shortfall. In addition, 47,000 doctors with obstetric skills are required, particularly in rural areas. Worldwide, 4.3 million health workers are lacking (WHO, 2007).

The second indicator relates to family planning. The unmet need for family planning is still unacceptably high in low- and middle-income countries. In sub-Saharan Africa, 24% of women who want to delay or stop childbearing have no access to family planning. This figure varies between 10–15% in the other world regions and further varies across population groups. For example, in Latin America and the Caribbean, averages of 27% of the poorest households have an unmet need for family planning versus 12% of the wealthiest group (WHO, 2005). In sub-Saharan Africa, Southern Asia and Latin America and the Caribbean, the high adolescent birth rates prevailing in the 90s have not declined significantly; despite continued reductions in total fertility in those regions (UN 2007).
Antenatal care is the third indicator towards universal access to reproductive health. The proportion of pregnant women in low- and middle-income countries who had at least one antenatal care visit increased from less than 55% in the early 1990s to almost 75% in a decade. Although this is an improvement, the recommended norm of four antenatal visits is still not accessible to many pregnant women worldwide: for example, 55% of those in sub-Saharan Africa (WHO, 2005).

Maternal health care coverage is therefore far lower than the global targets, especially for mothers from developing countries. They are still suffering from pregnancy related complication. Around 80% of all maternal deaths are direct obstetric deaths. As shown in Figure 2, these conditions are: post-partum hemorrhage (24%), unsafe abortion (13%), infection (15%), pre-eclampsia and eclampsia (12%) and obstructed labor (8%) (AbouZahr, 2003). Between 11% and 17% of the deaths occur during the delivery and between 50% and 71% in the postpartum period. About 45% of postpartum deaths occur during the first 24 hours, and more than two thirds during the first week (WHO, 2005). These figures point out that post-partum hemorrhage contribute to the largest proportion of maternal mortality.

**Figure 2. Common causes of maternal death (adapted from AbouZahr, 2003)**
1.4. Risk factors for maternal mortality
The high rate of deaths of women during pregnancy, childbirth or in the immediate postpartum period is due to different influencing risk factors. The lifetime risk of death due to pregnancy-related complications is 250 fold higher among women in developing than in developed countries (Yanagisawa et al, 2006). These are directly linked to socioeconomic, reproductive, and health service factors

1.4.1. Socio-economic factors
The general socioeconomic status of mothers, ability of women to manage resources and make independent decisions about their health has an impact on reduction of maternal mortality. Lack of education and poor knowledge about maternal health care can contribute to delays in seeking care during pregnancy and childbirth. Poverty is one of the major health determinants. Poor mothers are at high risk of developing pregnancy related complications. Almost all maternal deaths that occur in low and middle-income countries are mainly among the poorest of the poor (WHO, 2005).

1.4.2. Reproductive factors
The risk of a woman of dying in pregnancy and childbirth depends on the general reproductive health of the mother and the number of pregnancies she has had in her lifetime. The higher the number of pregnancies, the greater the lifetime risk of pregnancy related deaths (WHO, 2005). Maternal age also has an impact on increasing the risk of dying. Girls below 18 years and women older than 35 years are more likely to have pregnancy related complications that may lead to maternal death (USAID, 2005).

1.4.3. Health service factors
All pregnant women are at risk of developing complications during any time of their pregnancies, deliveries and postpartum periods. Most of the obstetric complications cannot be predicted but can be prevented and treated if women have access to appropriate health care. Lacks of access to emergency obstetric care and delay for emergency referral are contributing factors for high maternal mortality. Obstetrics complications are able to be treated in health institutions that are sufficiently equipped with supplies, medications and fully staffed with capably trained health professionals.

This thesis will focus on health services factors, particularly on the utilization of maternal health care services in a rural district of the Tigray region, Ethiopia. But before introducing the country profile, a brief review about factors influencing the use of maternal health care services will be presented.
1.5. Review of literature: determinants of maternal health care utilization

Globally, it is estimated that 34% of the mothers deliver with no skilled attendant; this means there are 45 million births occurring at home without skilled health personnel each year. Skilled attendants assist in more than 99% of births in developed countries compared with 62% in developing countries. In five countries including Ethiopia the percentage drops to less than 20% (WHO, 2005). Skilled attendance at delivery is one of the key indicators to reflect progress towards the Millennium Development Goal of improving maternal health. The agreement set the goal of 40% of all births to be assisted by a skilled attendant by 2005, with 50% coverage by 2010 and 60% by 2015 among countries with very high maternal mortality. Globally, the goal is to have 80% of all births assisted by skilled attendants by 2005, 85% by 2010 and 90% by 2015 (Stanton et al, 2006).

A study from South India showed that assistance during delivery can reduce the risk of obstructed labour and it is highly associated with the place of delivery (Navaneetham et al, 2000). Another study also presented the role of assisted skilled birth attendants in preventing direct and indirect cause of maternal deaths such as, infection, shock, blood loss, convulsions, and surgical procedures, such as caesarean delivery (AbouZahr, 2003). Maternal mortality and morbidity are directly and indirectly related to societal and cultural factors that impact women’s health and their access to services. Thus, lack of access and control over resources, limited educational opportunities, poor nutrition, and lack of decision-making contribute significantly to adverse pregnancy related outcomes. Review of the international literature also emphasizes factors like cultural beliefs, socio-demographic status, women’s autonomy, economic conditions, physical and financial accessibility, disease pattern and health service issues to be important determinants of the use of maternal health care services (Shaikh et al, 2004, AbouZahr, 2003).

A study from India have pointed out that the low utilization of maternity services seems to be due to low levels of household income, high illiteracy and ignorance, and a host of traditional factors (Shariff et al, 2002). A similar study in Pakistan described poor socio-economic status, lack of physical accessibility, cultural beliefs and perceptions, low literacy level of the mothers and large family size as the leading causes of poor utilization of primary health care services (Babar et al, 2004). In another study from Ethiopia, it was observed that the use of maternal health services can be influenced by the socio demographic characteristics of women, the cultural context, and the accessibility to these services (Yared et al, 2002).
In India, a study of analysis of choice of delivery location showed that maternal and, paternal education, and scheduled caste status were the predisposing factors that determined the choice of private facilities, public and home deliveries (Thind et al, 2008). In a similar way, a study from Pakistan showed that family size, parity, educational status and occupation of the head of the family were also associated with health seeking behavior in addition to age, gender and marital status (Babar et al, 2004). A study from rural Tanzania identified that ethnicity, gender of the household head, mother’s education, mother’s age at child birth, socio-economic and quality of services status were important independent factors in determining the choice of delivery place Sudden onset of labour or short labour were affecting decisions towards selecting the delivery place. Selecting health facility for delivery was perceived to be more desirable for prolonged labour (Mrisho et al, 2007).

In summary, the above studies have identified that the main determinants for low utilization of maternal health care services include maternal education, ethnicity, gender of the household head, mother’s education, mother’s age at child birth, socio-economic status, parity, accessibility and quality of health service, decision making power and experience of previous obstructed labour.

2. Country profile

2.1. Geography

Ethiopia is located in the horn of Africa and it is one of the largest countries in SSA which covers an area of 1.14 million km². It is the second most populous country in Africa next to Nigeria with a population of 74 million (51% of female, 49% male) (CSA, Census 2007). It is a country with great geographical diversity. Its topographical features range from the highest peak of Ras Dashen, 4,620 meters above sea level (masl), down to the lowest and hottest point of the earth in the Afar, Danakil depression, 110 meter below sea level (mbsl) (Figure 3.

2.2. Politics and administration

The country is a multi-ethnic society with approximately more than 80 nations, nationalities and peoples contributing with their own culture and language. Ethiopia’s government consists of the executive, legislative and judiciary branches. The constitution of the Federal Democratic Republic of Ethiopia (FDRE) established a federal system of government with nine regional states and two city administrative councils. These are further divided into 611 Weredas (districts) and 15,000 local administrations Kebeles. The majority (84%) of the population lives in rural areas (Argaw, 2007).
2.3. Economy

Ethiopia is one of the least developed countries in the world, with an estimated per capita income of US $160 in the year of 2005 (www.economywatch.com). Poverty is pervasive with 47% of the population estimated to live below the poverty line. The Ethiopian economy is based on agriculture, which contributes to 45% of the Gross Domestic Product (GDP) and more than 80% of the exports, employing 85% of the population. The agricultural sector suffers from frequent droughts and poor cultivation practices.

2.4. Health policy and organization

The government of Ethiopia issued its health policy in 1993, which emphasizes the importance of achieving access to basic primary health care services for all segments of the population. The health policy specifies that the health services should include preventive, promotive and curative components.

In order to achieve the goals of the health policy, a twenty-year health sector development strategy was formulated, being implemented through a series of five-year plans. The implementation of the first health sector development program (HSDP) was launched in 1997. This policy in turn is part of Ethiopia’s Sustainable Development and Poverty Reduction Programme (IDA/IMF, 2002). Decision making processes in the development and implementation of the health system are shared between the Federal Ministry of Health (FMoH), the Regional Health Bureaus (RHBs) and the Woreda Health Offices. As a result of recent policy measures taken by the Government, the FMoH and the RHBs are made to function more on policy matters and technical support, while the Woreda Health Offices have been made to play the vital roles of managing and coordinating the operation of the primary health care services (FMOH, 2005).
2.5. Health system and human resources

The Ethiopian health system is characterized by a four-tier system with a Primary Health Care unit (PHCU) which comprises one Health Center (HC), and five Health Posts (HP), a District Hospital (DH), a Zonal Hospital (ZH) and a Specialized Hospital (SH). A HP is aimed at serving 5000 people, a HC 25,000 people, while a DH and a ZH are each expected to serve 250,000 and 1,000,000 people respectively.

The overall health service coverage has improved throughout the years. However, this varies substantially among the regions depending on their topographic and demographic characteristics. Geographical distance from a health facility and socio-economic factors are the major obstacles for people to get access to health care. The health facilities of the country include 143 Hospitals, 690 Health Centers, 1376 Health Stations + Nucleus Health Centers (NHC), 9914 Health Posts, 1756 private clinics and 577 drug shops (FMOH, 2007).

Despite some improvements, the country faces major problems such as: shortage of health care professionals, limited resources and unequipped health facilities and lack of infrastructures. The ratio between service-providers to the population continues to be unacceptably low. The ratio of doctors per population is approximately 1:42706 and that of nurses per population was 1:4207, midwife per reproductive age women 1: 20,000, and health
The figures indicate that there is a huge gap between the demand of the population and the number of health professionals; the situation is worse in the rural areas of the country.

In order to ensure equitable access to health services, the country is implementing a community based programme under the name of Health Extension Program (HEP). This innovative programme is aimed at creating a healthy environment and living by making available community based essential health services at the grassroots level.

The HEP is designed to give services at tabia (sub district) level covering sixteen components (Figure 4). It is aimed at achieving significant basic health care coverage in the country, through the provision of a staffed health post to serve for about 5000 people. Every health post is staffed by two female Health Extension Workers (HEWs), who are high school graduates with an extra one year training course. Being the HEW female, mothers feel more comfortable to seek health services, mainly reproductive health and other maternal health care services.

HEWs have their own roles and responsibilities (Box 1). They go house to house to train, demonstrate, and educate families to create role models in line with health extension program and to disseminate it for the community. These activities can facilitate and increase mothers need for use of family planning, antenatal care and institutional delivery, prevention of malaria and HIV/AIDS, and prevention of harmful traditional practices which has a subsequent effects on reducing maternal mortality. The HEWs provide services in the HP and at the community.

Under the family planning services they distribute oral contraceptive pills, injectable contraceptives and condoms. Supervision of Community health workers (TBAS, CBRHAS) who are participating in the distribution of oral contraceptive pills, condom and educating families about child spacing are also the duties of the HEWs.

Antenatal care is another main activity for the HEWs. This is carried out through providing health education on birth preparedness, early detection of abnormal pregnancies, educating mothers about prevention of bleeding, danger signs, prevention of infection and safe delivery, immunization, women’s nutrition, early transportation (referral), prevention of HIV/AIDS, iron supplementation and use of insect side treated nets during antenatal care service.

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**Antenatal care coverage**: Percentage of women who used antenatal care provided by skilled health personnel for reasons related to pregnancy at least once during pregnancy, as a percentage of live births in a given time period (WHO).
Health extension workers are in addition responsible for providing safe and clean delivery, managing hemorrhage, preventing infections, identifying problems and complications early and making referrals to appropriate levels of health service. Moreover, they provide postnatal care service and teach mothers on how to care for herself and her baby, and to enable prevention of complications that arise during delivery. The health extension workers give supportive supervision to TBAs and community health workers too.

TBAs play an important role in assisting home deliveries since they are still accepted by the community. TBAs are responsible to mobilize the community and to disseminate information regarding importance of maternal health care service. They encourage women to use maternal health care services, teaching communities on disease prevention and promotion. Currently however the government has not been providing refreshment trainings and other motivation supports to encourage TBAs.

**Box 1. Roles and responsibilities of HEWs**

<table>
<thead>
<tr>
<th>Roles and responsibilities of Health extension workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Health Post Administration</td>
</tr>
<tr>
<td>2. Outreach services and home visits</td>
</tr>
<tr>
<td>3. Provide immunization, family planning, Antenatal, delivery and postnatal care services</td>
</tr>
<tr>
<td>4. Trained model households on components of HEP and provide health education</td>
</tr>
<tr>
<td>5. Provide referrals to Health Centers and follow up on referrals</td>
</tr>
<tr>
<td>6. Supervise and support Community Health workers</td>
</tr>
<tr>
<td>7. Provide reports to the health centers (Woreda Health Offices).</td>
</tr>
</tbody>
</table>

Community mobilization
2.6. Health status

As in many developing countries, Ethiopia experiences a poor health condition. The main health problems that account for about 60-80% of the disease burden in the country are communicable diseases and nutritional deficiencies. In addition, widespread poverty, low educational level, poor socio/economic status, inadequate access to clean water and sanitation facilities, low health care utilization and poor knowledge on disease prevention are major contributors to the current ill-health of the population. A shortage of trained personnel and insufficient funding also hinder the equitable distribution of health services (FMOH, 2007).

The health indicators of the country reflect the presence of high level of maternal, infant and under 5 mortality which is estimated to be at 673/100,000 live births, 112/1,000 live births, and 123/1,000 live births respectively. Meanwhile, the population growth rate of the country is 2.5, the average life expectancy at birth is 48 years, the average age at first marriage 18 and the total fertility rate (TFR) 5.9 (WAMAI, 2009).

HIV/AIDS, Tuberculosis (TB), malaria, diarrheal disease and acute respiratory tract infection (ARI) are among the ten top diseases. Malnutrition is prevalent particularly among children and mothers (FMoH, 2007).

2.7. The Burden of maternal mortality and morbidity

Maternal mortality rate in the country continues to be at an unacceptably high level. An estimated 2.9 million women give birth every year; of these approximately over 25,000 women and girls die each year and more than 500,000 suffer from serious injuries and
permanent damage to their health, such as obstetric fistulas. It is estimated that 100,000 women suffer with untreated fistulas across the country and another 9,000 women develop fistulas every year which are mainly caused by obstructed labor and a lack of maternal health care (FMOH, 2007). The emotional and social crisis is the most stressful consequences of the injury. They become discriminated by their husbands, families and the societies, becoming unable to care for them physically and economically. This situation is further aggravated by the high population growth, gender inequality, early marriage, female genital mutilation, unwanted pregnancy, unsafe abortion, and sexually transmitted diseases (STDs) including HIV/AIDS (FMOH, 2005).

2.8. Maternal Health Care in Ethiopia

2.8.1. The National Reproductive Health Strategy

The Government is committed to enhance the Reproductive Health (RH) status of women, men and young people of Ethiopia. The development of the National RH Strategy builds on the existing health policy, HSDP, and the HEP, while at the same time seeks to enhance the effectiveness of the health system in meeting the targets of the Millennium Development Goals (MDGs). Main priority areas identified from the large scope of services under RH umbrella include: the social and cultural determinants of women’s reproductive health; fertility and family planning; maternal and newborn health; HIV/AIDS; RH of young people; and reproductive organ cancers (Box 2). The strategy include three levels of analysis: the “community”, which comprises the broader social and cultural context of each health issue; the “system”, which looks at opportunities arising from the delivery of health care services; and “policy”, which examines the institutional and normative frameworks within which decisions are made (FMOH; 2006).
The strategy also considers interrelations between socio-cultural determinants such as gender discrimination, harmful traditional practices and their negative impact on reproductive health (FMOH, 2006).

However in Ethiopia, since 85% of the population lives in rural areas, availability of health services, especially maternal health care services, is extremely difficult. Overall, access for maternity care is on average 23% for rural and 52% for urban populations (USAID, 2009). Approximately 30 percent of households were estimated to live more than 10 kilometers from the nearest hospital, health center, or health station. Besides, most facilities have inadequate supplies of drugs and equipment, poor equipment maintenance, and a deteriorating infrastructure (Saharty et al, 2009).

2.8.2. Maternal health care

Maternal health care coverage as measured by antenatal care, delivery service, postnatal care, and family planning increased from 2002/3 to 2006/7 by 24.73%, 7.39%, 10.56% and 11.84% respectively. Despite these achievements, several studies have identified that maternal health service utilization in the country is low. Some of these studies have also tried to explore the determinants of this low utilization of services.

Yared et al. illustrated that the majority (94%) of births are delivered at home. Among these, 28% were assisted by TBAs, 61% by relatives or others and 5 % delivered without any type of assistance at all (Yared et al, 2002). In another study based on a national census survey, 28% of mothers received antenatal care from a health professional for their most recent birth;
only 6% of babies were delivered by a health professional and 5% at a health facility (DHS, 2005). These studies illustrated that institutional delivery service utilization was consistently below 6% (DHS, 2005, Yared et al, 2002.).

Determinants of low utilization of maternity care in Ethiopia include low educational level and income, residence, lack of women empowerment, poor access to maternal health care service and poor knowledge on maternal health care services (Yared et al, 2002). Women with no education were less likely to be attended delivery by a health professional than women with some secondary or higher education (DHS, 2005). Another study in north Gondar Zone identified that the use of skilled birth attendants was significantly influenced by the level of education. Women with higher level of education (secondary and above) were 10.6 times more likely to use safe delivery services that those with lower education levels (Nigussie et al, 2004). Place of residence has also been shown to influence delivery services. In the capital city, Addis Ababa, three in four babies were delivered in a health facility while in the rest of the country (with the exception Harari, Dire Dawa and Gambela) only about 5% of babies were delivered in a health facility (DHS, 2005).

Utilization of safe delivery services has been significantly associated with previous obstetrics complications. It was five times higher among those who had previously developed one of the lives threatening obstetric complications compare with those who had not (Nigussie et al, 2004). Marital status, parity, and number of children under five were also common predictors for the utilization of maternal health care services. Higher parity women, together with greater responsibilities within the household and for child care, have been suggested as explanatory factors for their tendency to use services less frequently (Yared et al, 2002). As the HSDP III midterm review indicated, poor health status of pregnant women and their newborns in Ethiopia included a high fertility rate, widespread poverty, low female literacy, low nutrition status, and poor access to health services. Additionally, early marriage, gender in equality, female genital cutting and closely spaced pregnancies aggravated the problem (HSDP III, 2008).

As stated above, the Government has given a priority to improve maternal health services. Accordingly, various measures have been taken to increase skilled attendance at antenatal, delivery and postnatal care as well as access to emergency obstetric care, early referral system and training of TBAs and community health workers. Measures are tailored to address societal and cultural factors that influence women’s health and their access to maternal health services.
Lack of access and availability of emergency obstetric care is a contributing factor to slow progress in maternal mortality reduction in Ethiopia. Emergency obstetric complications include hemorrhage, prolonged or obstructed labor, postpartum sepsis, abortion complications, pre-eclampsia or eclampsia and ectopic pregnancy and ruptured uterus. When these complications arise, it is a life saving situation to get emergency obstetric care. The basic emergency obstetric care (BEOC) includes parental antibiotics, oxytocic drugs, sedatives for eclampsia, manual removal of retained products and basic neonatal life support and the Comprehensive Essential Obstetric Care (CEOC) all those in BEOC plus obstetric surgery, anesthesia and blood transfusion (Nadew, 2007). However many pregnant women have difficulties to access emergency obstetric care,, especially in rural areas, due to the 3 delays: delay in deciding to seek care, delay in reaching care in time, and delay in receiving adequate treatment. The first delay is on the part of the mother, family, or community not recognizing a life-threatening condition. The second delay is in reaching a health-care facility, and may be due to road conditions, lack of transportation, or location. Many villages do not have access to smooth roads and many families do not have access to vehicles. The third delay occurs at the healthcare facility. Upon arrival, women receive inadequate care or incorrect treatment, and a lack of supplies to provide critical care (Nour, 2008).

2.9. Rationale for the study

In Ethiopia, studies addressing determinants of maternity care services utilization are scarce, and these studies have been mainly focused on urban areas and health centers and hospitals. Therefore it is important to explore and describe determinants of institutional delivery service utilization in rural areas at the primary health care\textsuperscript{iv} unit level.

Since HEP will continue to be implemented to improve skilled delivery service in the country, it is important to understand the impact of the intervention. Few studies have been carried out in the country exploring the performance of the HEP (Argaw, 2007). But no study so far has been conducted to find out the impact of HEP on increasing the use of maternal health care services in Tigray region. It is therefore urgent to assess the effectiveness of this intervention. This study will provide valuable information and help to programme mangers and implementers to address gaps and to understand factors influencing the use of intuitional delivery service utilization in the PHCU.

\textsuperscript{iv} Primary health care: Essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-determination (Alma Ata international conference definition)
3. **Aim**

This study is aimed to assess the impact of the HEP on the antenatal and delivery care service utilization at health facility level and to understand the reasons for the non-utilization of those services in Saharti samre district, Tigray, Ethiopia.

3.1. **Specific Objectives:**

- To assess the trends of maternal health care service utilization in the study area
- To determine the magnitude of antenatal care, delivery and skilled birth attendant service utilization at health facilities.
- To identify the socio-cultural, economic and health service factors contributing to low institutional delivery service through a quantitative survey.
- To explore experiences and attitudes of the communities on determinants of ANC and institutional delivery service utilization through a qualitative study.

4. **Methods**

4.1. **Quantitative methods**

4.1.1. **Study area and study subjects**

Tigray regional state is located at the northern part of the country. The region shares common borders with Eritrea in the north, the State of Afar in the east, the State of Amhara in the south, and the Republic of the Sudan in the west. It has an estimated area of 50,000 square kilometers. The region is divided into four zones and it has 47 Weredas (districts); out of which 35 are rural and 12 are urban. Mekelle is the capital city of the region. The region has an estimated total population of 4,565,000 consisting of 2,314,000 (50%) females. Eighty percent of the population is estimated to be rural (Ethiopian census 2007) and about 85% of the populations are farmers. The majority of the population is Christian. According to the Tigray Health Bureau, it has 5 zonal hospitals, 7 district hospitals, 42 health centers and 600 health posts. The maternal health care coverage indicators are: antenatal care 58.6%, percentage of birth attended by skilled health personnel 19.2%, percentage of birth in health facility 8.5%, contraceptive prevalence rate 1.6%, prevalence of obstetric fistula 1.6%, total fertility rate 5.1 and HIV prevalence among pregnant women aged 15-24 years 4.7 (TRHB, 2007).
4.1.2. Study District

The study district, Samre-Saharti, is located in the regional state of Tigray, Ethiopia. The district has 23 tabias (sub-districts) and 64 kushets (villages). It has an estimated population of 124,000 with 51% females (census of 2007). The majority of the populations are farmers and Christians. Women of reproductive age constitute approximately 30,000 (24%) of the population. Annual delivery is estimated to be 6,250 births.

Each tabia has its own health post with two HEWs. There is one HC in the district town which functions as referral center, and other four HCs in the rural area. There are about 150 health workers, 155 TBAs, 144 CHWs, 200 CBNAs and 40 CBRHAs. The general health care service of the district is very poor. Like the other districts, there is shortage of supplies and health workers. Malaria, ARI, diarrheal diseases and malnutrition are among the ten top diseases.
4.1.3. Study design and sampling

The study design was a community-based cross-sectional survey. Cluster sampling technique was utilized to select the study population. All Kebeles found in the district were included in the study. A total of 1150 households from 21 tabias and 30 selected kushets were visited from August - September 2009. The units of analysis for this study were women who had only one live birth in the last five years before the survey.

The sample size calculation for the study was estimated for a descriptive study using tables for estimation of a proportion with specified absolute precision. Previous community based studies in Ethiopia have shown a prevalence of institutional delivery of 6%. An anticipated population proportion of 6%, a confidence level of 95%, and an absolute precision of 2 percentage points (4%-8%), with a design effect of two to correct for the effect of cluster sampling was used. The sample size (n) was calculated using the formula $n = \frac{z^2 \cdot p \cdot (100-p) \cdot \text{DEFF}}{d^2}$. Applying the formula, the required sample size obtained was $n = 1.96^2 \cdot (5) \cdot (100-5) \cdot \frac{3}{22} = 1,115$.

Before choosing the clusters all tabias were listed with their kushets; two tabias which were difficult to reach were excluded. Main reasons for exclusion were flood (as it was rainy season) and safety of enumerators (as they were all females). Then a lottery was drawn to sort tabias and their respective kushet by chance. Following this, a population cumulative was determined. After drawing up the cumulative population the sample interval was calculated by
dividing the overall population by the number of clusters desired. Then, a number between one and the sample interval was generated from Excel version 8 to use as starting point. Sequentially the sample interval was added until the desired numbers of clusters were obtained.

The required thirty clusters were chosen by population proportional to size (PPS) sampling. Within each cluster, a household who had a mother having one child in the last 5 years was the ultimate sampling unit. Households were chosen after a random start at a central place in the village (kushet). A pen or pencil was spun and the data collectors walked to the edge of the village in the direction of pen or pencil pointed, numbering all households along the way. A random number was chosen to identify one of these households as the starting household for the cluster and continued on the right-hand right side of this starting house until the required number of individuals had been recruited for the sample. If no household members were present at the time of the survey visit, the next closest household was taken.

4.1.4. Study subjects and data collection

Study subjects were mothers who gave birth once in the past five years preceding the survey period and permanent residents of study district. A structured questionnaire was prepared and translated into local language (Tigrigna) prior to the start of the fieldwork. The questionnaire was pre-tested to make sure that the questions were clear and could be understood by both the enumerator and the respondents. Based on the findings of the pretest, the questionnaire was further refined. The questionnaire collected information on socio-demographic and obstetric characteristics, delivery place, access to health service and use of ANC (See Appendix 1).

Fifteen (15) female enumerators who were fluent in the local language and four supervisors with similar work experience were selected for data collection. A three day training based on practical exercises was given to data collectors and supervisors. The training was focused on how to fill the questionnaire, mock interviews and field exercise. The supervisors were assigned to supervise the data collection process and perform quality checks. Training was carried out by the investigator to ensure the quality of the field operation.

Information to assess the trends was taken from the Tigray Regional Health Bureau health profile and from district reports consecutively for the last three years. It included the 2006, 2007 and 2008 health profiles regarding the performance of the districts. Proportions were calculated for each one of the years; the numerator were women registered as users of maternal health care services and the denominator the estimation by the Tigray Health Bureau of the number of eligible women for those services.
4.1.5. **Dependent variable**

Three response variables were created from questions included in the study questionnaire on antenatal care, institutional delivery and assistance. ANC use was defined if the mother had at least one visit and not received if the mother had no ANC follow up. Place of delivery was categorized as home if the mother gave birth at home and health facility if the mother gave birth at health center and health posts. Assistant of deliveries were categorized as skilled delivery if the recent delivery was assisted by HEW or HW and unskilled delivery if the recent delivery was assisted by TBA, mother, mother-in-law and other relatives.

4.1.6. **Independent variables**

In order to study the influence of explanatory variables on the utilization of ANC, institutional delivery service and skilled assistance, several predictor variables were selected and categorized. The independent variables were categorized as follows: Age of mothers was sorted as 16-29 years, 30-39 years and 40-50 years. Marital status was categorized as married for those who were currently living with their husbands, single for those never married, divorced for those currently separated, widowed for those who had lost their husbands. Respondent education was classified as illiterate, grade 1-4, grade 5-8 and 9-12 and above. Parity was categorized as 1-4, 5-7 and 8-11 children. Saftnet is a program for the poor, and mothers involved in the program were considered as poor and those who were not involved in the program considered as not poor according to the district classification. History of obstructed labor was classified as if the mother had experienced obstructed labour or not. Family education was classified as if the mother had a family member who attended at least secondary education or did not have. Husband encouragement was categorized as if the mother was encouraged by her husband to seek maternal health care or not. Abortion was classified as if the mother had a history of abortion or not. These variables were selected according the literature review.

4.1.7. **Data analysis**

STATA Version 10 was used to clean and analyze the data. Bivariate and multivariate analyses were carried out to elicit the impact of each factor on the pattern of ANC and institutional delivery service utilization of the district. Odds ratios and their 95% confidence intervals (CIs) were calculated.
4.2. Data collection qualitative study

Focus group discussion (FGD) was chosen as the tool for data collection. It aimed to explore and to share the experiences, thoughts, feelings, attitudes and ideas of participants on determinants of ANC and institutional delivery service utilization. The participants were purposely (convenient sampling) selected according to their experience and willingness to participate from different kebeles and kushets. Recruitment of participants was assisted by the chairpersons of the kebeles. Four FGDs (two with men and two with women) with 20 women and 20 men were carried out, majority of the participants were illiterate, farmers and in the age range of 18-55 years for women and of 25-65 years for men. The study participants had at least one child in the past five years and were permanent residents in the area. Leaders as well as village chairpersons were excluded from the groups to reduce possible interference with the freedom of expression amongst participants.

The discussion was designed to gather information on the choice of delivery place, who decided where to deliver, the use of and barriers for ANC and institutional delivery service utilization. Before the FGDs, the moderator introduced all participants, explained the general purpose of the study and topic of the discussions. The participants were informed about the tape-recorder and permission to be recorded was requested. Informed verbal consent was obtained from all individuals participating. The FGDs generally took place at the nearest school and health facility. The sessions lasted 40-60 minutes. The researcher and other trained moderator and two note takers led the discussion and it was recorded using a tape recorder. Tigrigna was the language used in all the sessions.

The moderators used the topic guide to direct the discussion and cover all of the relevant topics (See Appendix 2). The questions were selected in relation to the research objectives while taking into account local knowledge and cultural sensitivities. The sequence of the topics generally moved from the more general to the specific questions (Box 3). That unexpected topic that emerged was further explained following an emergent design.
Box 3. Topics and questions of the FGDs

1. What are the major maternal health care problems of the community?
2. What kinds of problems do mothers have here?
3. How does the community get information about maternal health care?
4. How does the community help a laboring mother when they have problems?
5. How do men deal and participate in maternal health care issues?
6. Do the mothers seek care on pregnancy and delivery?
7. What is the preference of delivery place? Why?
8. What are the practices of the mother on selection of delivery place?
9. Who is responsible for making decisions in health seeking in the family?
10. What are the factors influencing selection of delivery place of home/HF? Why?
11. What are the differences gave birth at health facility or home?
12. What are the opinions on quality of health care?
13. What are the religions, traditional and cultural practices of the community during labour?
14. Do the traditional practices hurt the laboring mother?
15. What has been done here to improve mother’s health?

4.2.1. Data analysis

Participants of the FGDs openly discussed and expressed different views, opinions, practices and experiences. The audio taped from FGDs were transcribed in full text and translated from Tigrigna to English. To ensure accuracy of the translation, it was retranslated and rechecked by the data collectors; no significant differences were found. The analysis started with listening of the audio, reading and re-reading of the text in order to extract important statements from the description.

Grounded theory analysis was used to analyze data. The FGDs were coded line by line as the first step of grounded theory. Potential categories were developed as a result of clustering codes and relations ships between categories were also identified. The categories developed were flexible enough to reach saturation through coding and categorizing. Finally, a core category with sub-categories was developed. The core category had relationships with the categories which enabled it to answer the research question “what are determinates of ANC institutional delivery and skilled birth attendant utilization in Saharti samre?”
In general, the findings of the FGD were grounded in the data which represented the phenomena being studied which also agreed with the way the GT is approached. This played its own role in increasing the validity of the study. The process of data analysis and interpretation continued until categories and theoretical connections between categories were completed. The study also included constant comparison, triangulation, and memos in order to increase the credibility of the study. Central category that has integrated the major categories mainly focused on the study and it appeared frequently in the discussion. The core category also tried to answer the research question. The core categories were imperative for the understandings and it clarified to represent the process of the topic under the study. The different codes were grouped according their similarity or their link to a broader category. Different categories were developed according to the content of the different codes.  

4.3. Ethical clearance  
Permission to carry out the study was obtained from the Tigray Regional Health Bureau and the Saharti Samre district health office. Each respondent gave informed verbal consent after being told the purpose and procedures of the study. All responses were kept confidential and anonymous. Informed verbal consent was also obtained from all individuals participating in the FGDs.
5. Results

5.1. Quantitative results

5.1.1. Socio demographic characteristics

The overall response rate was 1113 (97%). Of the total the respondents, 1084 (97.4%) were Christians, 986 (88.6%) were married, 922 (85%) were farmers and 482(43%) were in the age group 29-30 years with a mean age of 30.4 years. About 880 (79%) of mothers were illiterate and 588 (53%) were involved in the saftnet program (a program for the poor). Among the respondents, 477 (42.28%) had a family member with education above grade four and 877 (84.89) of their husbands were farmers. Nearly half of the households (47%) had 5-7 children and 31% had 3-4 children with a mean 5.6 children/woman. Among the respondents, 744 (67.06%) had TBAs and 869 (60.05%) had CHWs in their respective villages.

Among the participants, 192 (17%) had history of abortion and 94 (8.4%) of stillbirth. About 633 (57%) mothers preferred to have the next birth at home. Women mentioned (n=587, 60%) that their husbands also showed a similar preference. Most of the mothers (87%) did not know the advantages of health facility for delivery service.

5.1.2. Antenatal care

In the past five years, the proportion of women who received antenatal care for their recent births was 54%. There were enormous variations on use of ANC among mothers. Education, marital status and family education were significant predictors for ANC utilization. The other variables were not statistically significant (Table 1).

Education was an important determinate on use of ANC. About 78.5% of women with primary education and 86% with secondary education received ANC while it was 52% among those who were illiterate. Mothers with primary education (OR=3.38, 95% CI= 1.86-6.14) were higher to received ANC than those who were illiterate, and mothers with secondary education (OR=5.66 95% CI =2.15-14.87) were more likely to receive ANC than those who were illiterate.

Marital status also had an influence on the utilization of antenatal care service. About (55.7%) of the married women used ANC service compared single 32.3%. Married mothers (OR=2.2, 95% CI=1.32-6-54) were more likely to receive ANC than those who were single. Divorced mother (OR=1.1, 95% CI= 1.12-7.20) were higher to receive ANC than those who were single.

Mothers who had a family member who attended a secondary education 56.3% were more likely to use ANC than to those who did not, 47%. The likelihood of a woman to receive
antenatal care was higher in women who had a family member who attended a secondary education compared to those who did not have (OR = 1.3, 95% CI=0.99-1.75). But it was not significant in multivariate analysis.

The majority of the women (98.4%) were not encouraged by their husbands to receive ANC. But all of them who were encouraged received ANC.
Table 1. Socio demographic characteristics of mothers and its association with received ANC for the recent births in Saharti-Samre district

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
<th>Received ANC n (%)</th>
<th>Odds ratio (95% CI)</th>
<th>Adjusted Odds ratio (95% CI)(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-29</td>
<td>473 (42.5)</td>
<td>262 (55.4)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>482 (43.3)</td>
<td>262 (54.3)</td>
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<td>18 (100)</td>
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<td>501(54.4)</td>
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</table>

\(^a\)Adjusted for all the significant variables

* NA: Not applicable
5.1.3. Place of delivery

The study demonstrated that institutional delivery service utilization was very low. In the last five years only 4.1% of mothers gave birth in the HF for their recent child. The majority of births 95.9% took place at home compared to 4.1% births at different health facilities of the district. Out of those who delivered at health institutions, 0.3% were at the health post and the remaining were at the health center (Table 2). Education, family education, low parity, history of prolonged labor and receiving ANC were significantly associated with selection of institutional delivery.

One interesting finding is that women with secondary education (38%) were more likely to use the HF for delivery place than illiterate mothers (3%). Mothers with secondary education (OR=13.5, 95% CI=4.64-39.39) were more likely to select a health facility for delivery place than those who were illiterate.

Another important determinant was family education; mothers who had educated family member/s were positively influenced to select health facility as a delivery place. The probability of a mother who had a family member who at least attended a secondary education (OR=10.95, 95% CI=5.2 - 23.07) of giving birth at a health facility was 11 times higher than those who did not have.

Similarly, low parity was found as one of the most important predictors of delivery place preference. Women with 8-11 children (OR= 0.24, 95% CI= 0.07–1.03) had less odd of selecting HF for delivery services than women with 1-4 children. There was a significant association between parity and selection of place of delivery.

History of obstructed labor appeared to be positively and significantly associated with the selection of delivery place. Women who had a history of obstructed labor (OR=6.3, 95%, CI=3.43-11.6) were more likely to select HF for delivery service than women who had not that experience.

Receiving ANC was also a significant factor on the selection of health facility for delivery. Women who had antenatal visit (OR=4.6, 95% CI=1.90 - 11.18) were higher to seek institutional delivery than women who did not have ANC visit.

Mothers who had husband encouragement (OR= 1.3, 95% CI =0.17-10.4) had a 30% higher risk of giving birth at HF compared with those who did not have. Nevertheless it was not statically significant. All divorced mothers 100% gave birth at home compared to single mothers (90%). Marital status, age, saftnet and history of abortion did not show a significant association with selection of delivery place.
Table 2. Socio demographic characteristics of mothers and its association with giving birth at home or health facility for their recent birth in Saharti-Samre district

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<td>HF n (%)</td>
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aAdjusted for all the significant variable
5.1.4. Assistance of delivery

In general, the proportion of delivery assisted by skilled attendants was also very low. Of the total home deliveries, 53% were assisted by relatives and mothers, 41% were attended by traditional birth attendants (TBAs) while the rest 6% were assisted by HEWs (Figure 7).

Figure 7. Percentage of mother assisted by TBAs, HEWs, and Mothers from 2004-2009

![Figure 7](image)

Only two variables, education and received ANC, were identified as significant predictors of skilled birth attendant utilization (Table 3). Consistent with findings for ANC and institutional delivery, education was a significant and independent factor for selection of skilled birth attendant.

More than one third (40.6%) of mothers with secondary education were assisted by skilled birth attendants compared with illiterate mothers (4.6%). Mothers with primary education (OR=2.1, 95% CI=.98 – 4.5) had a 2.6 times higher risk to be assisted by skilled birth assistances than those who were illiterate. Mothers with secondary education (OR=3.2, 95% CI= 1.44 - 4.44) were more likely to be assisted by skilled birth attendant than those who were illiterate.

Another important and independent factor of utilization of skilled birth attendant was received ANC. Mothers who had antenatal visit (OR=2.5, 95% CI=1.11 - 1.41) were more likely to be assisted by skilled birth attendants than women who did not have ANC visit.
Women who had an educated family member had an influence on selection of birth assistance. The likelihood of mothers who had a family at least attended secondary education (OR=1.16, 95%CI=.65-2.79) had higher chance to be assisted by skilled attendant than women who did not have educated family though it was not statistically significant. Marital status of the mothers did not influence the choice of delivery assistance. It revealed a similar proportion of both single and married respondents (92.3% and 93.3% respectively). The majority of births were assisted with unskilled birth attendants. In addition to this, 57% of mothers preferred to give birth at home and wanted to be assisted by their mothers and TBAs for their next deliveries. Sixty percent of the respondents pointed out that their husbands also preferred home as a place of delivery. Similarly previous experience of obstructed labor had positive influence on selection of delivery assistance. The probability of having skilled assistance to mothers who had experienced obstructed labor (OR= 1.2, 95% CI .73-2.27) were more likely to be assisted by skilled birth attendant than mothers who did not have. Additionally mothers who had history of abortion (OR=1.46, 95% CI=.84 -2.65) were 46% higher chance to select skilled assistance than those who didn’t have. However none of them showed a statically significant relationship.
Table 3. Socio-demographic characteristics of mothers and its association with assisted by skilled or unskilled attendants for recent births in Saharti-Samre district.

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<th>Mother n (%)</th>
<th>HEW n (%)</th>
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<td>1.16 (0.65-2.07)</td>
</tr>
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<td>256 (94.1)</td>
<td>16 (5.9)</td>
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<td><strong>Husband encouragement for seeking maternal health care</strong></td>
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<td></td>
<td></td>
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<tr>
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<td>1026 (93.6)</td>
<td>69 (6.4)</td>
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<td>16 (89.0)</td>
<td>2 (11.1)</td>
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<tr>
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<td>175 (91.6)</td>
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<td>511 (46)</td>
<td>493 (96.5)</td>
<td>18 (3.5)</td>
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</table>

*aAdjusted for all the significant variables*
5.2. Trends of maternal health care in Sharti Samre District

The generally maternal health care service utilization in the district was very poor. In the past three years the trend of using maternal health care service utilization has been increasing. However institutional delivery service and postnatal care service utilization is still low in the health facilities compare with services provided by TBAs (Figure 8).

Figure 8. Maternal health care service in the past 3 years in Saharti samre District

ANC: Antenatal care
DS: Delivery service
PNC: Postnatal care
5.3. Qualitative Results

Four FGDs were conducted involving a total of 40 participants, approximately 10 in each group, with an age range of 18-66 years old and all having at least one child. In the presentation of the results, quotes originated from the FGDs are indicated from women or men.

5.3.1. Why is antenatal care not used?

The majority of the participants had a positive perception of antenatal care in both women and men group discussions. They believed it was good for the health of the mother and the baby. In practice, however, most of women did not attend ANC. They mentioned that most of the women want to hide the pregnancy for their partners and community. The reasons for this denial were fear, sham and it is also traditional not to tell about the early stage of pregnancy. In both groups they discussed that mothers have poor perception about their pregnancy and they were unwilling to share pregnancy related issues. In addition they had a heavy work load, making them unaware of pregnancy related complications. Some of the participants perceived that ANC had no advantages.

“Most of the time we women have many responsibilities; caring our children, and we are engaged in farm and household activities. Therefore, even though we know the presence of health facility in our Tabia, we don’t have time to go to the health facility. For example, given I have six children, how could I go to the health facilities leaving them alone at home? Due to this reasons I decided not to go.” (Married woman, 45 years from Hadsh Lemlem Tabia)

“We had traditional and cultural problems that can hinder a mother from seeking health care. If a woman actively involves in community activities (health education meetings, women’s gatherings) she will be perceived as most disfigured and be isolated from the society. Thus, women are afraid of showing themselves as pregnant and seeking maternal health care. We men also do not want our wives to attend maternal cares including ANC, health education sessions and other activities” (Married man 50 years from May Tekili Tabia)

"I started going to the clinic when I was 7 months pregnant; I was too sick when I was pregnant and therefore decided to go to the health facility. But I had only two ANC visits because my village is too far from the health post, so I was tired to go in my appointment days" (Married woman 30 years, from Chelli Tabia).
5.3.2. Who decides to attend ANC?

Most of the participant mothers mentioned that their husbands and parents usually decided for them. They also pointed that they had to ask for permission from their husbands to attend ANC. Some participants however expressed that the decision and discussion about ANC with the husband or family was not necessary since it was a personal issue.

“We always ask permission to our husbands before we decide about what we want to do. In a similar way we have to ask for to seek care during pregnancy. At present, the HEW teaches us at home about ANC and we have some awareness about the use of ANC. Meanwhile if we need money for medical fees, since we don’t have money at hand, we should ask our husbands” (Married women 35 years from Adeba Tabia).

“When I was pregnant from my third child, I was ill and tired so I want to go to the health facility and I asked my husband, but he was not willing to take me to the health facility. I was sick for about three months at home and finally I faced a difficult delivery at home. I lost too much blood and the baby died. Finally they took me to the health centre and they saved my life” (Married women 40 years from Nebera Hdinet Tabia).

Some women in the focus group discussion mentioned that there were husbands that encouraged their wives to go to the health facility during pregnancy. But, despite the encouragement by their husbands, others thought that women themselves did not use the ANC services.

In the men group, they discussed and mentioned that there was a change in the new generation and young ladies and educated mothers in the community had a better understanding on use of ANC. However, most of them agreed that still as they were entitled to the decision about the health of their wives including ANC. They believed that it was right and correct for a husband to decide for his wife.

“Being the head of the family, we husbands have responsibility for making the decision on family matters including health. Our wives don’t have the power because they should be obedient to the decision of their husbands.” (Married man 58 years from Dekera Tabia).
5.3.3. Why is it better to deliver at home?
Most of the respondents mentioned that they preferred home as delivery place, and almost all had given birth at home their most recent birth. According to the participants of the FGDs, economic, social and cultural believes, transport problems, poor quality of services, decision making power, sudden onset of labor and poor access of the health facility were the main reasons why mothers gave birth at home. They also mentioned the above factors as the main barriers for not using health facility services in general. They pointed out that home delivery reduced unnecessary transport and other costs. Some of the mothers stated that they even gave birth at home after attending ANC services because of long distance of the HF. They also claimed that mothers who had educated family and relatives living in towns and cities had better information about institutional delivery and gave birth at HFs.

5.3.4. Transport problem
Participants described transport as one of the major problems during child birth and when emergency referral was decided. Most depended on the means of transportation stationed at the district, which created a delay to reach to the HF. Occurrences of maternal deaths caused by the delay in receiving care due to inability to pay for the transport were discussed in the FGDs. In the majority of kushets (villages), public transport was not available and there were no other transport opportunities to go to the nearby health facilities. They stated that if a mother at labor did not get any transport, the only choice left for her is to give birth at home and to be exposed for life threatening situations. Some of the FGD participants stated that sudden onset of labor was also a reason for having birth at home. Women perceived however that to deliver at a health facility delivery was supposed to be advantageous for prolonged and obstructed labor.

"we know how home delivery is dangerous when labour is complicated ,but our health facility is too far, because we do not have transport access and it is difficult to transport a laboring mother by manpower and carry for at least 2-3 hr ,she might give birth in the way; it happens we saw when mothers gave birth in the way before reaching to the health facility. So we are afraid of this situation, then we decide to give birth at home, and we always believe in St. Mary and God, so the delivery becomes safer by the willingness of God not by the health worker" (Married women 38 years old from Maykana Tabia).
“I knew my neighbor died during child birth because of transport problems. She entered in labour in the evening. She suffered the whole night and day. So in the second day she told her mother and grandmother that she wanted to be taken to the health facility. The mother didn’t want because it takes long time to reach. We were praying outside while the rest of the mothers were assisting her. But she couldn’t give birth. Then the community tried with the traditional practices (firing a bullet and other sound emitting activities) but she didn’t give birth. Finally she died ... left her children behind. In our kushet, this situation happened” (Married women 45 years from Nebar Hadianet Tabia).

Mainly in the FGDs with men, the issue of costs beyond the transport such as accommodation for accompanying people, food, and sometimes drugs was highlighted.

“We preferred home for delivery even though we know the existence of health facilities in our Tabia. We don’t want to take our wives to give birth at health facilities because it is difficult to carry a labouring mother, it may take 3-5 hrs to reach the health facility. We believe health facility is good for those who have difficult labour and if the mother is taking to the health facility all the family and community becomes stressed and disturbed, even during working time so no need to disturb the community, so I preferred my wife to give birth at home” (Married men 53 year, from Adishsisay Tabia).

5.3.5. Decision making power and selection of delivery place and assistance

Most of the participants stated that their husbands and their parents were the decision makers for their health and the selection of delivery place. They pointed out that a woman should ask permissions for her husband before she goes to the HF. Some did not know whether delivery needs a decision since they did not know when their delivery day was. All the participants agreed that most of the time decisions were made by their husbands and relatives.

They commented that since all were poor, illiterate and dependent, they had less decision making power about their general health. In the men groups, most of them agree as they were entitled to the decision about selection of delivery place assistance. Some of them said as the parents were also involved in decision making. They believed that this is correct.

“We are the deciders in all matters of our family. Women must always accept our decision because they trust us. Mothers want to give birth at health facility. But we don’t allow them to go. My sister in-law was in labor when I arrived at her home. Families and neighbours were gathered and praying. I was shocking and asked them what was going on. They told me that she was in labor for two days and the position of the baby was not normal. I had an experience from my family how this is dangerous. So I decided to take her immediately to the
health centre. As a result, she gave birth after one hour. When she got pregnant for the second time, and knew her delivery time was approaching she came to my home and told me that her husband might not be willing to take her to the HF. So she asked me to convince him to let take her to the health facility when labor starts. This means our wives prefer the HF for their delivery but they don’t have the power to decide. The decision depends on our willingness” (Married man 45 years from Maytekili Tabia).

5.3.6. Economic factors
The FGD respondents argued that the majority of mothers were poor. This might be the main reason for the selection of home delivery. Cost of treatment, transport, and other out-of-pocket costs were mentioned as constraints. Poor basic infrastructures (road, ambulance, health facilities and their equipment), lack of decision making power, lack of women empowerment, inequity, low educational status and less attention to basic women health and basic rights were discussed as the result of poverty.

“Most of the time the reason why we don’t use the health facility is because of our economic problems, we knew our economic status because we are poor so even though we need to go to health facility we can’t pay all the costs of transport and medication. So we need to select home where we didn’t have those costs” (Widowed woman, 54 years from Dekera Tabia).

5.3.7. Awareness about Maternal Health
Even though the awareness of maternal health care was weak in both groups, men were relatively better informed about maternal health than their wives. They knew what to do and they did believe HF was good for complicated deliveries. Majority of the mothers had a good awareness about ANC; they have a more positive attitude and knowledge about the advantages of ANC than the intuitional delivery. They believed that the delivery is normal and natural and it is better to give birth at home. Mothers were less involved in maternal health related sessions. They were not aware about pregnancy related complications and advantages of maternal health care. When women died at home during delivery, many believed these deaths were due to the unwillingness of God, and it was due to lack of chance of the mother.

5.3.8. Religion, traditional and cultural factors
Most of the FGD participants also described traditional and religious factors were hindering the use of institutional delivery. Since most of the respondents were Christians they mentioned that St. Mary (Mother of Christ) had helped them to have a safe birth and to bear
the pain during labor. It is traditional that all the relatives, mothers, husbands, religious leaders gather and practice religious prayers till the mother gives birth instead of taking the laboring mother to the health. They believe the prayer will help the mother to have an easy delivery without the assistance of a skilled attendant.

Even though this practice has been reduced lately, some of the participant mothers still believed that there is an evil spirit who possessed the mother and will never be exorcised. So, they should always be loyal to that spirit, and they said the pregnant mother should not go anywhere to have a child. It is believed that the evil spirit will punish the mother for her wrong actions. Traditional related practices (firing a bullet and doing other sound emitting activities) are believed to let the mother’s uterus to be open enough to facilitate a safe delivery.

“I don’t think delivery needs decision because it is a sudden onset and it is a natural process. From my experience labour starts suddenly. When I gave birth for my second child the labour was started when I was in the field to fetch water. Then my neighbours were with me and supported me to back home; then I gave birth in short time. I think it needs to be lucky to have easy delivery, and it depends on the willingness of God. No need to think and discuss about delivery. We don’t know when St. Marry comes” (Widowed women 42 years from Tabia Amdiwewaye).

5.3.9. Quality and access of maternal health care

In all the FGDs sessions it was discussed about the quality of health care. The participants perceived as having several components, including the mothers’ chances of recovery, the provision of free medicine and other services. They pointed out as main barriers the long distance from their home and the difficulty of transporting a labouring mother for two-three hours, shortage of skilled birth attendants, and of equipments. In addition they mentioned that the HEWs were not available in the health posts when needed sometimes and they had no experience on delivery service.

All the participants revealed that older mothers and TBAs were more accepted by the community than HEWs because of their experience and the respect to privacy of the laboring mother. They also perceived that the HEWs and HWs were not good on handling and respecting the laboring mothers.
“My older daughter is educated, and when I was pregnant for the last child she convinced me to go to the health post to check my pregnancy. When I go I didn’t found the HEW at the HP. So when we need them they are not available. This might be a reason why we didn’t go to the HP. Because we thought we don’t find them. Look it is too far and I was pregnant and tired” (Married women 37 years from Adeba Tabia).

Different categories were developed according to the content of the FGDs. Main categories of the FGDs were, low educational status, male dominancy, low socio-economic status, religion and cultural believes and Poor quality of health service and lack of accessibility to health care. Lack of decision making power was developed as the main (core) category of the study. The selected core category also had three sub- categories; economic, socio cultural and institutional factors which in turn were grouped in the core category. Many codes were grouped in to each category by making the categories flexible. The above categories and sub categories had their own contribution in the development of the core category which tried to answer the research question. Most mothers said their husbands were the ones to make the decision for their health related issues. They also said they were not well aware about maternal health care. The different religious, cultural, social and decision making power factors also had contributed to the present poor access of maternal health care in the study district. The following categories try to visualizing the main barriers to the use of health facilities for ANC and delivery according to the different categories.

**Categories of main findings:**

- Low educational status
- Male dominancy
- Low socio-economic status
- Religion and Cultural believes
- Poor quality of health service
- Lack of accessibility to health care

**Core category**

Lack of decision Making power
6. Discussion

In this current study we deployed both a quantitative and qualitative method; it facilitated a better understanding of the magnitude and determinants of ANC, institutional delivery service and skilled birth attendant utilization.

From the survey, the study showed that the coverage of mothers who received antenatal care for their recent births was 54%, as previously documented elsewhere in the country (Yared, 2003, HSDP III, 2005, Nigussie et al, 2004). The current finding was lower than the regional one (68.3%) (TRHB Profile, 2008). The reason for the difference could be that our study was conducted in a rural area under the primary health care units, while the regional report included urban areas and hospitals.

Similarly, institutional delivery service utilization was very low in the study district. The majority of births took place at home; only 4.1% births took place at different health facilities, despite the fact that institutional delivery is free of charge and the HEP is in place. This was lower than the regional 17.4% (unpublished report on household survey, TRHB 2009) and the national 6%. Again, the possible reason for the discrepancy could be that our study was conducted in rural areas under the PHC setting; however the regional and national studies included urban areas and hospitals (Yared, 2003, Mekonnen, 2002, DHS, 2005).

Correspondingly the proportion of delivery assisted by skilled birth attendants was also very low. Only 6% were assisted by skilled birth attendants, whereas 53% were assisted by relatives 41% by traditional birth attendants, as earlier showed in the country (Nigussie et al, 2004, Mekonnen, 2002). Our result showed it is also lower than the regional 17.7%, the reasons for the difference also similar to the mentioned above.

The trend of institutional delivery service utilization increased during 2006 (2.8%), 2007 (11.3%) and 2008 (12.6%) in the study district. The trend of ANC utilization also increased from 21% to 56.4% in the last three years. It showed a higher coverage than the current study. The possible justification for the discrepancy with the current study could be, firstly that our data was collected at the community level. The district data was reported from the health facility and might have quality problems. Secondly, our data included women who had only one live birth in the last five years while data from the district included only three years and all mothers giving birth at the health facility.

The data showed that, in the past three years the trend of maternal health care service utilization in the health facilities was lower compare to services provided by TBAs, despite
HEW were in place. A possible reason could be that during delivery assistance TBAs were more accepted by the community than HEWs because of the community perception, experience and traditional believes. In addition mothers might perceive that HEWs had no better knowledge and skills on delivery assistance than TBAs.

The main purpose of this study was to identify determinants that influence the use of ANC; institutional delivery services and skilled birth assistance. Factors identified for facility delivery include education, family education, parity, history of prolonged labor, and receiving ANC. This result was in line with other studies conducted in the country (Yared et al, 2003, Nigussie et al, 2004). Similarly women’s education and marital status were significant predictors for ANC utilization. Regarding skilled birth attendant only two variables education and received ANC were found as significant predictors.

This study illustrated a wide variation in use of ANC, institutional delivery and skilled attendant between educated and illiterate mothers. Mothers who attended secondary levels of education were more likely to use ANC, select health facility for delivery place and assisted by skilled attendants than those who were illiterate. This finding is consistent with findings from elsewhere (Mrisho et al, 2007, Thind et al, 2008, Shariff et al, 2002, Edward et al, 2009, Gubhaju et al, 2003).

There are reasons of why education influences the use ANC, institutional delivery service and skilled attendant. Educated women are expected to have knowledge and awareness about the advantages of the interventions and pregnancy related complication. They are more likely to seek modern health care than those who are not. Education is likely to improve the general status of women and help them to build up confidence to make decisions about their own health.

The other finding of the current study is that having educated family member who at least attended a secondary education has an important predictor on selection of intuitional delivery. Women who had educated family member/s are more likely to select health facility as a delivery place. A main explanation for this could be that an educated family member in the household could influence positively the mother and their family. Firstly, they have reproductive health education on their formal education. Secondly, they could have better access to information through reading and following media about maternal health care. Consequently they could have better knowledge about the advantages of maternal health care and pregnancy related complications.
Low parity was found as one of significant predictors for selection of HF for delivery place. Mothers with 1-4 children were more likely to give birth at HF than women with more than four children. This finding materialized to be consistent with most studies done elsewhere (Chakraborty et al, 2003, Yared et al, 2002, Nigussie et al, 2004, Babar et al, 2004). The possible explanation for selection HF for delivery services among women with lower parity implies that those women might be younger and has better understanding about the advantages of maternal health care. In addition, lower parity woman might look for delivery assistance more than mother with high parity due to their less experience in child birth that might develop fear about the difficulties during labor. This could motivate them to seek maternal health care. The other possible explanation for the low utilization of maternal health care services among higher parity women could be due to resource and time constraints because of their big family size and caring their children and other house work load. In addition, high parity women could have more experience on child birth and they might think delivery is normal and develop self-reliance and preferred to give birth at home with mothers and relatives assistance.

Another significant result of the current study revealed use of HF was higher among those who previously experienced obstructed labor. The finding appeared to be consistent with studies done elsewhere (Nigussie et al, 2004, Chakraborty et al, 2003, Yanagisawa et al, 2006, Mrisho et al, 2007). The possible explanation could be that mothers who had history of obstructed labour have practical experience about the life treating conditions than those who did not. This experience could motivate the mother to give birth at health facility.

Another interesting result of the current study is that received ANC has appeared as a significant predictor on the use of institutional delivery and skilled assistance. Mothers who attended antenatal follow up for the recent pregnancy have five times higher chances of delivering at a health facility and approximately 2.8 times higher chance to be assisted by skilled birth attendants. This finding is consistent with earlier studies elsewhere (Gubhaju, et al 2003; Stanton et al, 2006). The possible explanation is that women who had antenatal care follow up could received advice and health education about pregnancy related complications and advantages of giving birth at a health facility and assisted by skilled attendant.

Marital status was a significant determinant for use of antenatal care. Married and divorced women were more likely to received ANC than single mothers. This was similar to other studies conducted in the country (Mekonnen et al, 2002). This could be due to fear of stigma because a pregnancy without marriage is not accepted by the community in the study area. Therefore it appears rational to see that most of single and widowed mothers might be faced
unwanted pregnancies. Moreover, these mothers want to hide their pregnancy from their parents and the community instead of receiving ANC. In most cases single mothers are never married and might be too young and aggravating the stigma.

Husband’s encouragement to seek maternal health care seems to be a considerable predictor on selection of instructional delivery and skilled birth attendants. Unfortunately, the majority of mothers were not encouraged by their husbands to seek care during pregnancy and child birth. Women encouraged by their husbands were however more likely to use HF for delivery service and assisted by skilled birth attendants though it was not found statistically significant. The qualitative study explores majority of women requests premonition from their husbands and relatives to go to the health facilities. Thus decision to seek maternal health care was associated with husbands and relatives willingness. In any case the husband seems to be the most key person in the decision-making process. It could be related also with women’s economic status since they are dependent on men. This finding has also been described elsewhere (Mrisho et al, 2007, B. Pembe et al, 2008).

This study also examined the perception, attitudes and practices of the community on attendance to antenatal care, institutional delivery and skilled birth assistance. The most important constraints identified were economic and transport problems, the mothers lack of decision making power, religion belief, traditional and cultural problems, lack of awareness on the advantages of maternal health care, perceived poor skills of the HEWs, the distance to the health facility and the short onset of labour. These reasons were classified as three sub categories economic, health facility and socio-cultural factors under the core category of lack of decision making power.

Low socio-economic status of the mother was found to be an important factor for the selection of home delivery. A possible explanation to our finding is that poor mothers are unlikely to afford the cost of transport and other medical costs. Even though, the service in the health post is given free of charge, it incurs costs when complicated delivery is referred to health center. In addition mothers from low socio-economic status could have limited access to information about maternal health care, low self esteem, and low health seeking behavior. Other studies have shown comparable results with this (Berhane et al, 2001, Chakraborty et al, 2003, Pembe et al, 2008; Yanagisawa et al, 2006; Mrisho et al, 2007). A study from Tanzania found that lack of money was a main factor for home delivery. Availability of cash for transport was prominent as an important reason on whether health facility delivery is required (Mrisho et al, 2007).
According to the FGDs participants transport facility was described as one of the major problems during child birth and when emergency referral was decided. They stated also there were poor basic infrastructures (road, ambulance) and inaccessibility of public transports. In most cases, laboring mothers were taken to the health facility if delivery was complicated. Transport in rural areas is extremely hard for different factors: it is limited and the available ones are often in poor condition. During the rainy season the roads are washed away and too muddy or impassable. The commercial transport in towns usually departs in the morning and return late evening. If somebody misses it, it is extremely difficult to get another transport. Furthermore, the health facilities, especially the health centers, are far from the kushets, it takes 2-3 hours and it is difficult to carry laboring mother by manpower to the nearest health facility. Our finding was consistent with other studies conducted in developing countries (Mrisho et al, 2007, Pembe et al, 2008, Dubale, 2007, Mihret et al, 2007; Yanagisawa et al, 2006, Chakraborty et al, 2003).

The FGDs indicated that decision making power had a key influence on the utilization of ANC, institutional delivery and skilled birth attendant services. Women must ask permissions from husbands, mothers, mothers-in-law or grandmothers for seeking care during pregnancy and child birth. Decision to seek maternal health care attention is affected by various factors including, education, household income, socio-cultural, traditional and community perception. According to FGDs, mothers with low socioeconomic and educational status were less likely to decide about their general health. Additionally, these mothers had less possibility to select institutional delivery and skilled birth attendant since they did not decide about themselves. The other reason could be male dominancy and the lack of women empowerment. Our study was consistence with other studies elsewhere (Magoma et al, 2010, Pembe et al, 2008).

Socio-cultural, religion and traditional factors were also capital factors that influenced use of ANC, selection of institutional delivery and skilled birth attendants. Since most of the respondents were Christians, majority of mothers who gave birth at home believed for many years that St. Mary had helped them to have a safe delivery. They practice religious prayers till the mother gives birth instead of taking the mother to the health facility where HEW and delivery equipments are in place. Our findings have also been described in other studies from developing countries (Mrisho et al, 2007, Thind et al, 2008).

Based on the FDGs discussions, the deep rooted traditional, cultural and religion practices were negatively influencing the health seeking behavior of the mother. They perceived that the HF is only for obstructed and complicated labour. They strongly emphasized that the delivery was up to the willingness of God, not up to the continuous support of health
professionals. It was also generally perceived that pregnancy and child birth were a normal phenomenon. They did not consider that it required special attention. This could be the explanation for why the majority of mothers gave birth at home and the reason for low maternal health care utilization.

The participants identified lack of knowledge and awareness of the community and access to information on maternal health care issues as barriers to use maternity care. Majority of the mothers had a more positive attitude and information about the advantages of ANC than to the institutional delivery. They pointed out that the HEWs were teaching them about maternal health care in their home. Despite of this, majority of them were not aware about pregnancy related complications and advantages of institutional delivery. They also witnessed when mothers die at home during delivery; they believed these deaths occurred due to the unwillingness of God. This was consistence with other studies elsewhere (Shariff et al, 2002; Babar et al, 2004).

Despite the existence of the HEP in the study area, information, dissemination and awareness’ creation to the community were highly limited. It could be due to the work load of the HEWs since only two HEWs are in charge of the 16 components of the HEP for 5000 population with very scattered villages in the tabia. Additionally, most of the time the HEWs are more focused on specific element of the HEP.

According FGDs informants, poor quality of health care service was perceived. Mothers’ chances of dying while giving birth at health facility, lack of free drugs, distance, absence of ambulance, shortage of skilled birth attendants and of equipments were describe as constraints. In addition, they pointed out that HEWs were some times not available in the health posts when they needed and thought as they had less experience on delivery service. Majority of participants revealed that older mothers and TBAs were more accepted by the community than HEWs because of their experience and privacy of the laboring mother. This is consistent with other studies conducted elsewhere (Berhane et al, 2001, Mrisho et al, 2007; Shaikh et al, 2004, Pembe et al, 2008).
7. Limitations

In summary, this study was carried out by combining both qualitative and quantitative methods; it facilitated to get reliable data and strengthen the findings. Despite the strengths, this study had also limitations.

Firstly, two eligible tabias were excluded from the study because it was rainy season, flooding and hard to reach area. In the excluded tabias maternal health care service was poorer than the other tabias because of lack of transportation and access. Thus, the findings from these tabias might be worse than the others.

Secondly, HEWs were participating in data collection; this might have an influence on the mother’s replies to questions related to health personnel. However, no obvious variations were observed in the results.

Other limitation is related to the reliability of data for trend assessment, since they were taken from health profile reports, they might be incomplete and had lack of standardization. The projection of population and eligible mothers for instance were different every year.

The questionnaire was assessing the use of maternal health services in the last five years preceding the survey which might have introduced recall bias in the use of the services.

Supervision of the field work and guidance to data collectors might be inadequate because of rainy season and transport constraints.

For FGDs we had plan to include health workers as informants to assess the provider’s point of view but they were not included because of general meeting of the district. This could have provided relevant information from their experience and strengthened our findings.

8. Conclusions

In general, the study has revealed that mothers in this area were not considerably utilizing ANC, institutional delivery and skilled birth attendants. Maternal educations, family education, low parity, marital status, previous experience of obstructed labor and attended ANC were enabling factors for utilization of these services. Economic and transport
problems, illiteracy, high parity, lack of decision making power and knowledge, religion, cultural and traditional believes were found as disabling factors.

The results from both bivariate and multivariate analysis confirmed maternal education was significant predictor variable for all the services, it is implicated that an enormous variation on use of maternal health care among the educated and illiterate mothers. Therefore it needs special effort and attention to improve formal education for mothers and girls, especially secondary education. In addition ANC attendant and low parity was an important predictor to increase delivery and skilled birth attendant utilization. Thus, increase access to family planning and strengthening ANC service will be critical to improve institutional delivery and skilled birth assistance.

The findings of this study will assist in planning and select interventions on improving maternal health care with short and long term point of view. The main issues for sustainable effects are increasing community awareness at the grassroots level. In the long run, increase knowledge on maternal health care through community conversation, strengthening of HEP and active community participation provision of intensive health education by use of local radio, community health workers and HEW will be important.

This study could be generally applicable to other areas of the region since the districts are similar in health service delivery. The identified problems could be useful in developing and implementing effective interventions to improve the quality of maternal health care services at the primary health care unit. It could help to improve maternal health and consequently reduce maternal deaths which would lead to achieve the MDG5.

9. Recommendations
Policy makers and health planners need to recognize the determinants of maternal health care service use. More efforts should be given to educate mothers, to improve men involvement and religious leaders, to strengthen community participation, to increase political commitment and to boost accessibility to maternal health care services. Emphasis should also be given for capacity building for skilled birth attendants and HEWs.

TBAs are highly accepted by the community since majority of the births were assisted by them and play an important task in providing maternal health care information. Hence, most
of the former TBAs who took training were becoming old, and the new ones are not taken formal TBAs training. Accordingly refreshment training and motivation will be crucial to strengthening the program.

The government and other responsible bodies should make efforts to increase community based health education, awareness creation and improve better access to information for mothers regarding maternal health care will be imperative.

The provision of PHC services are a fundamental pillar in the reduction of maternal mortality. However, the quality of HEP (especially maternal health care) services being provided at the health posts requires urgent assessment.

To improve ANC, institutional delivery service and skilled birth attendant utilization, Health Posts and Health centers should be fully operational and increase the capacity to adequately provide all the services. Therefore it is also urgent to facilitate and supervise the existing services, guidelines and protocols to be practical.

Community participation should be strengthening through the implementation of health committees with collaboration of civil society and CHWs in order to arrange local transport and to motivate the community to seek maternal health care. Additionally involvement of communities’ stakeholders on planning, implementing, monitoring and evaluation is important to create sense of ownership.

Traditional beliefs, religion beliefs and other harmful practices were negatively influencing the community and mothers on the selection of the health facility. Accordingly, efforts should be made to create awareness regarding the disadvantages of the traditional harmful practices through mobilizing the general public and involvement of elderly mothers and religious leaders.

Finally, further studies will need to explore the existing maternal health care services utilization and the current performance on HEP and its impact on reduction of maternal mortality. More qualitative studies need to be carried out to get women's perspectives on the provision of maternity care services and what interventions would be appropriate.
References


WHO, World Health Organization (2005), Factsheets Maternal Mortality,


11. Appendix 1. Questionnaire on Determinants of ANC and Institutional Delivery Service utilization in Sharti-samre District, Tigray, Ethiopia

Interviewer name:__________________________________________Interviewer code:□□
Date:□□/□□/□□□□ Kushet name:__________________________Kushet code: □□□□□□
Household code:□□□□

**Social demographic data**

1. Respondents age_____ years
2. Marital status
3. Respondent’s occupation
   4. Housewife □  5. Governmental employer □  6. Other (specify)________
4. Respondent’s education
   1. Illiterate □  2. 1-4 grade □  3. 5-8 grade □
   4. 9-12 grades □  5. Higher education □
5. Respondent’s religion
   1. Orthodox □  2. Muslim □  3. Protestant □
6. What is the main occupation of your husband?
   1) Farmer □  2) Daily labourer □  3) Merchant □
   4. Governmental employer □  5. Other (specify)________
7. What is your husband’s education?
   1. Illiterate □  2. 1-4 grade □  3. 5-8 grade □
   4. 9-12 grade □  5. Higher education □
8. Do you have any family members who attend formal education? 1. Yes □  2. No □
9. If yes level of education?
   1. 1-4 grade □  2. 5-8 grade □  3. 9-12 grade □  4. Higher education □
10. Do you ever have health education on maternal health? 1. Yes □  2. No □
11. If yes for question 9 by whom?
   1. HEWs □  2. CHWs □  3. TBAs □  4. CBAN □
   5. CBRHA □  6. HW □  7. Radio □  8. Other (specify)______
12. What are the major maternal health problems in your community?
   1. Pregnancy related problems ☐  2. Nutritional problems ☐
   3. Inadequate health care ☐  4. Far of Health facility ☐
   5. Frequent of pregnancy ☐  6. Fire smoking and related diseases ☐
   7. No problem ☐  8. don, t know ☐  9. Other (specify) ______

12. Do you have any health facility in your kushet?  1. Yes ☐  2. No ☐  3. Don, t know ☐

13. How far is the nearest health facility from you house……….minutes

14. What type of community health workers do you have in your kushet?
   1. CHW ☐  2. TTBA ☐  3. CBRHA ☐  4. CBAN ☐

15. Do you involved in the saftnet program?  1. Yes ☐  2. No ☐

16. If yes for question 14 since when……………year

17. Family monthly income if merchant or Employer……..

   Obstetric History

18. Number of total pregnancies in lifetime
   1. One-four ☐  2. Five-seven ☐  3. Eight- eleven ☐

19. Number of pregnancies in the last five years
   1. One ☐  2. Two ☐  3. Three ☐

20. Number of under five children
   1. One ☐  2. Tow ☐  3. three ☐

21. Number of total family size
   1. One-three ☐  2. two - four ☐  3. Five-seven ☐
   4. Eight-eleven ☐

22. Do you have history of abortion?  1. Yes ☐  2. No ☐

23. If yes how for (question 5) how many times?
   1. One ☐  2. Two ☐  3. Three ☐  4. More than three ☐

24. Do you have any history of stillbirth?  1. Yes ☐  2. No ☐

25. If yes for (question 7) how many times?
   1. One ☐  2. Two ☐  3. three ☐  4. More than three ☐

26. Did you attend ANC for your recent pregnancy?  1. Yes ☐  2. No ☐

27. If yes for question (26) at what gestational age you start___________

28. If yes for question (26) how many times______________
29. If yes for question (26) why?
   1. I was sick ☐  
   2. Health facility near ☐  
   3. Good service ☐  
   4. Husband encouraged ☐  
   5. To know my health status ☐  
   6. To know my fetus status ☐  
   7. Other (specify)________________

30. If ANC yes, during your visit did you receive any advice where to deliver?
   1. Yes ☐  
   2. No ☐

31. If ANC, No question (26).why?
   1. No health problem ☐  
   2. Work load ☐  
   3. Health facility far ☐  
   4. Husband refused ☐  
   5. Afraid fee ☐  
   6. Hw not poor handling ☐  
   7. Feel sham ☐  
   8. Don’t know importance ☐  
   9. Other (specify)_____________

**History of the Recent Delivery**

32. Year of birth of the recent baby_______________

33. Place of birth for the recent baby
   1. At home ☐  
   2. Health post ☐  
   3. Health center ☐

34. If at home who assisted you
   1. Mother ☐  
   2. Mother –in-low ☐  
   3. TTBA ☐  
   4. Neighbor ☐  
   5. HEW ☐  
   6. Others specify_______

35. If at health facility who assisted you?
   1. HEW ☐  
   2. Nurse ☐  
   3. Midwife ☐  
   4. Health officer ☐  
   5. Don’t remember ☐

36. If you gave birth for the recent baby at home, why?
   1. Easily labor ☐  
   2. Transport problem ☐  
   3. Health facility far ☐  
   4. Husband refused ☐  
   5. Afraid user fee ☐  
   6. Poor service ☐  
   7. Feel sham ☐  
   8. ST. Marry help me ☐  
   9. Poor skill of health workers ☐  
   10. Don’t knows importance ☐  
   11. I was sick ☐  
   12. Other (specify)________________

37. If you gave birth at health facility for the recent baby, why?
   1. I was sick ☐  
   2. No fee ☐  
   3. Health facility near ☐  
   4. Good service ☐  
   5. Family allowed ☐  
   6. Save mothers life ☐  
   7. Received health education ☐  
   8. Other (specify)___________

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38. Who decide where you gave birth and by whom?
   1. Myself  
   2. My husband  
   3. Both of us  
   4. Mother  
   5. Mother – in-low  
   6. TTBA  
   7. Neighbor  
   8. HW  
   9. Father  
   10. TBA  
   11. Others specify______

39. Who decide where you gave birth and by whom?
   1. Myself  
   2. My husband  
   3. Both of us  
   4. Mother  
   5. Mother – in-low  
   6. TTBA  
   7. Neighbor  
   8. HW  
   9. Father  
   10. TBA  
   11. Others specify______

40. Do you think there is a difference giving birth at home and health facility?
   1. Yes  
   2. No  
   3. Don’t know  

41. If you think health facility if better (question 40) how and why?
   1. Clean  
   2. Save mothers life  
   3. No retain placenta  
   4. No bleeding  
   5. Save child life  
   6. Shorten labor  
   7. Other (specify)__________

42. If you think home if better (question 40) how and why?
   1. No need of transport  
   2. No cost  
   3. No bleeding  
   4. There is privacy  
   5. Other (specify)________________

43. Did you have any history of difficult labor (obstructed labor)?
   1. Yes  
   2. No  

44. If yes for question (43) which type?
   1. Bleeding  
   2. Retain placenta  
   3. Prolonged labor  
   4. Mal presentation  
   5. Still birth  
   6. Other (specify)______

45. Where do you preferred to give birth for your next delivery?
   1. Home  
   2. Health facility  

46. By whom do you preferred to assist for you next delivery?
   1. Mother  
   2. Mother – in- low  
   3. TTBA  
   4. Neighbor  
   5. HW  
   6. Others specify_______

47. Where is your husband’s preference place for your next delivery?
   1. Home  
   2. Health facility  

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Name of Facilitator …………………………Name of Note taker ……………………………
Date…………………………………… Place of discussion ……………………………
Time discussion started……………… ……..Time ended……………………….………….…
Number of Participant …………………… Women…………men…………………………
Occupation of participants, Farmers………..Merchants………daily laborer………………
Governmental employer…. ………………………House wife………………………………
Age of participants, 15-25 years……26-36 years…..37-47 years ……..> 48years…………

Introduce moderators, not takers, participants and introduce the objective of the discussion and topics.

I am interested to in know about the practice, experience, concerns and problems of the community about maternal health. I am especially interested to understand the issues of ANC, delivery and birth assistance. I hope that your answers to my questions will important to understand the situation and it will help full to improve maternal health care in this area.
I expect our discussion to last about 40-60 minutes. Thank you. Agree on group norms and confidentiality.
First, I would like to ask you some general questions about your community:

1. What are the major maternal health care problems of the community? Can you give some examples of the problems?
2. What kinds of problems do mothers have here? Has the problems gotten worse, better, or stayed the same in the last year?
3. How does the community get information about maternal health care? Can you give some examples?
4. How does the community help a laboring mother when they have problems? Do you know mothers who have been forced to delivery problems? How does the community respond to this?
5. How do men deal and participate in maternal health care issues?
6. Do the mothers seek care on pregnancy and delivery? When mothers are pregnant, do they usually see a health worker? traditional birth attendants (TBAs)? What do women do when they are pregnant? Why?
7. What is the preference of delivery place? Why?
8. What are the practices and experience of the mother on selection of delivery place? Why do you think most of mothers who are pregnant do not seek any skilled assistance during child birth?
9. Who is responsible for making decisions in health seeking in the family? Do women look for help when they experience difficult labor?
10. What are the factors influencing selection of delivery assistance and place of home/HF? Why? Can you give some examples?
11. What is the difference between giving birth at health facility or home? Why? What are the differences of assisting by HW, HEW/TBAs, and mothers? Why?
12. What are your opinions on quality of health care? Do the existing services helping mothers during pregnancy and child birth?
13. What are the religions, traditional and cultural practices of the community during pregnancy and child birth?
14. Do the traditional practices hurt the laboring mother? Can you give some examples?
15. How can and how should this community prevent maternal death during pregnancy and child birth? What is the role of mothers and the community in reduction of maternal morbidity and mortality?
16. Before we finish, I would like to hear what did you think about the subjects we have discussed were important? Do you think that this group covered issues that are important to mothers? What has been done here to improve mother’s health? Is there anything the government can do?

Do you have any questions for me? If anyone would like to speak with me in private, I will stay here after we end.

Thank you all for your time and ideas. This has been extremely helpful. As I said in the beginning, the purpose of this discussion was to know about the situation of maternal health care and the problems you are facing. I hope this study will help full to address the problems and improve the service in this area.

Thank you for your participation.