

**ADDIS ABABA UNIVERSITY
FACULTY OF MEDICIN
SCHOOL OF PUBLIC HEALTH**

**Assessment of practices of women during pregnancy and childbirth
with the perspectives of HEW's role, Gubalafto Woreda, North Wollo
Zone, ANRS, Ethiopia**

**By
Yigzaw Diress (BSc)**

**Advisor
Mullugeta Betre (MD, MPH)**

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Acronyms

AAU	Addis Ababa University
ANC	Antenatal Care
ANRS	Amhara National Regional State
CBAW	Child Bearing Age Women
CHA	Community Health Agent
CHWs	Community Health Workers
CBRHAS	Community Based Reproductive Health Agents
EDHS	Ethiopian Demographic and Health Survey
FGD	Focus Group Discussion
HEWs	Health Extension Workers
HIV	Human Immuno Deficiency Virus
HH	Household
HSDPIII	Health Sector Development Program III
HSEP	Health Service Extension Program
IEC/BCC	Behavioural Change Communication
MDGs	Millennium Development Goals
MOH	Ministry Of Health
PNC	Post Natal Care
SPSS	Statistical Package for Social Science Research
SPH	School of Public Health
TBAs	Traditional Birth Attendants
TTBAs	Trained traditional Birth Attendants
WHO	World Health Organization

Abstract

Background: Pregnancy and childbirth and their consequences are still the leading causes of death, disease and disability among women of reproductive age in developing countries more than any other single health problem. Nearly 536 000 women die each year from pregnancy and childbirth related complications globally. Effective antenatal care use has been shown to influence women's use of delivery services, probably the most effective intervention in reducing maternal mortality in the developing world. Supporting women at delivery is an essential part of public health care.

Objective: This study assessed practices of women during pregnancy and childbirth with the perspective of HEWs role in this regard.

Methodology: A cross sectional community based survey supplemented by qualitative design was conducted in Gubalafto Woreda, North Wollo zone from February to March 2009. Multistage cluster sampling technique was used to select the sample of 841 women. Data were collected through structured, pre-tested questionnaires. The data were entered in to Epi Info version 3.5.1 and analyzed on SPSS version 13 computer software. A univariate, bivariate and multivariate analyses were done using frequencies, chi-square and binary logistic regressions respectively. The study was conducted after approval of Institutional Review Board of faculty of Medicine, Addis Ababa University and by ascertainment of informed verbal consent from study participants.

Result: The result of the study revealed that 63.4% of ANC attendance and 8.4% of HFs delivery to their last pregnancies of the respondent women. Harmful traditional practices that are commonly experienced during pregnancy and childbirth like abdominal massage and leaving the cord untied were found prevalent. Around 35% of mothers and more discussants expressed their dissatisfaction with HEWs less involvement in conducting normal labor and most of the HEWs themselves described as they had never attended normal labor. Multivariate analysis had shown that maternal age, marital status, age at first pregnancy, perceived pregnancy and childbirth risks and women's decision making status were significantly associated with ANC attendance. Women who were able to decide by themselves for health service utilization were found to utilize ANC more than two times than their counter parts (AOR=2.53, CI= 1.86, 3.45). In this study, previous ANC attendance and ever delivered at HF prior to the last pregnancy are found to be significant predictors of health facility delivery. Women who had antenatal care attendance at least once were almost three times more likely to give birth in the health facility than who did not have any ANC attendance (AOR= 2.86, CI= 1.34, 6.11).

Conclusion: The main reasons mentioned for ANC non attendance and not giving birth in the HF were associated with the maternal low awareness of the need of care, and socio-economic factors. In line with this, HEWs inability to attend normal labor contributed to the very low HF delivery. As a result, IEC/BCC to increase women's awareness on obstetric risks and general health seeking behavior, promotion of prenatal and delivery care service utilization, training for HEWs, equipping and staffing HFs are recommended. **Keywords:** Practices, pregnancy, childbirth, HEWs

1. Introduction

1.1 Back ground information

Each year more than half a million women die from pregnancy and childbirth related complications in the world. Twenty years ago, the safe motherhood initiative was launched by WHO (World Health Organization) and others to help reduce the severe global burden of pregnancy-related illness and death (1).

Access to professional care in the pregnancy, Childbirth and post partum periods are key in addressing the major causes of maternal mortality. If comprehensive services were made available, we could save most of the lives of the mothers who die. Antenatal care providers could show women how to look after themselves during pregnancy and deal with any serious health problems that may arise. The Democratic Republic of Congo, Ethiopia and Nigeria have the highest death rates in Africa for mothers and children (2).

A study on maternal health care in rural Kenya showed, of 635 participants, 90% visited the antenatal clinic (ANC) at least once during their last pregnancy. Most women (64%) first visited the ANC in the third trimester; a perceived lack of quality in the ANC was associated with a late first ANC visit. Eighty percent of women delivered outside a health facility; among these, traditional birth attendants assisted 42%, laypersons assisted 36%, while 22% received no assistance (3).

The study result on patterns of maternity care service utilization in Southern Ethiopia: Evidence from a community and family survey revealed that only 26.1% and 3.3% of the women received antenatal and delivery care services respectively. Untrained TBAs (Traditional birth attendance) assisted about 31.5% of the women at delivery and 61.1% of the women had their deliveries attended at home by relatives, neighbours, friends or family members (4).

Baseline assessment on reproductive health situation in North Wollo and South Wollo Zones of ANRS indicated that 45.3% claimed to have had ANC by health professional, 94.2% reported to have their last baby delivered at home and only 7.1% had postnatal care of which most were performed by health workers (5).

1.2 Statement of the problem

Pregnancy and childbirth and their consequences are still the leading causes of death, disease and disability among women of reproductive age in developing countries more than any other single health problem. Over 300 million women in the developing world currently suffer from short-term or long-term illness brought about by pregnancy and childbirth. Maternal mortality is by far highest in sub-Saharan Africa, where the lifetime risk of maternal death is 1 in 16, compared with 1 in 2800 in rich countries(6).

The MDGs (millennium development goals) place a central focus on public health in recognition of the fact that improvements in public health are vital not only in their own right but also to break the poverty traps of the world's poorest economies. A significant number of the MDGs are explicitly about health: reducing the maternal mortality rate by two-thirds by 2015 (7).

A study conducted to compare pregnancy and child health outcome among adolescents in Ethiopia from a population based national data (DHS) showed, about 5% of the 663 teenage mothers were <15 years old at the time of index pregnancy. Less proportion of them (36.5%) compared with the adult mothers (46.2%) actually had antenatal visit. Large proportion (70-80%) of both groups of mothers gave birth at home. (8).

Ethiopian Demographic and Health Survey (EDHS) 2005 report on ANC (antenatal care), and assistance at delivery in Ethiopia showed, 28% of mothers received ANC from health professionals. Only 6 % of births are delivered with the assistance of a trained health professional, and 28% are delivered by a traditional birth attendant. The majority of births are attended by a relative or some other person (61%). The current estimate for the maternal mortality ratio (MMR) in Ethiopia is 673 deaths per 100,000 live births (9).

Unlike EDHS, the Ministry of Health Ethiopia had documented that deliveries attended by skilled health personal was 16.4% (10).

In our country, women's practice towards modern maternal health care service utilization is very low. As briefly indicated above maternal health services like ANC, skilled attendance at birth, are not adequately utilized by the mothers. Rather traditional practices may outweigh and together with this may endanger the health and life of the mothers. Therefore, this study had aimed at assessing comprehensive practices of childbearing age women during pregnancy and childbirth together with the role of HEWs (health extension workers) in maternal health care service provision in Gubalafto district of North Wollo.

1.3 Significant of the study

Assessing the general practices of women during pregnancy and childbirth is essential since the majority of maternal morbidity and mortality causes may be due to either failure of women to practice and utilize modern maternal health care services (like ANC and safe delivery utilization) or may practice in accord to the established traditions that may harm their health and babies. Again, antenatal care is an important entry point for many maternal health care services. Identifying practices of women during pregnancy and childbirth is helpful to avert harmful practices and to promote helpful ones by the front line health workers such as HEWs (health extension workers) at the grass root level.

As it has been asked by the 'Beyond the numbers... WHO 2004' why deaths of women happened and how they can be averted? Are women dying because:

They are unaware of the need of care or unaware of the warning signs of problem in pregnancy? Or the services do not exist, or are inaccessible for other reasons, such as distance, cost or socio-cultural barriers? Or is the care they receive is inadequate or actually harmful? (11).

Besides, such type of study that assesses women's comprehensive practices during pregnancy and childbirth is not done in the study area before. So addressing this important topic and coming up with necessary information may be helpful to improve maternal health and reduce maternal mortality which is a major public health concern in our country.

2. Literature review

Each maternal death or long term complication represents an individual tragedy for the woman, her partner, her children and her family. More tragically, most deaths are avoidable. The main causes are known, and more than 80% of maternal deaths could be prevented or avoided through actions that are proven to be effective and affordable, even in the poor Countries of the world. Of all health indicators, maternal mortality reveals the greatest gap between rich and poor women, between and with in countries (11).

The literature review is presented in the following four sections.

I. Determinants of maternal health care service utilization

1.1 Socio-demographic and economic factors

1.2 Obstetric factors

1.3 Health facility, woman's decision making and other factors

II. Practices during pregnancy

III. Practices during childbirth.

IV. HEWs' role in maternal health care service provision.

I. Determinants of maternal health care service utilization

1.1 Socio-demographic factors

A review of the literature suggests that in developing countries, the use of modern health care such as maternal health care services can be influenced by the socio-demographic characteristics of women, the cultural context, and the accessibility of these services (12).

A number of socio-demographic characteristics of the individual such as maternal age, parity, large family size, lower educational attainment, and family income have been repeatedly examined as determinants of health care use. (13,14).

Most of the studies conducted on maternal care utilization in developing countries identified those mothers who are younger than 35 years, attended at least primary education, employed, married, reside in urban are more likely to use maternal health care

services than their counter parts. Further more, living standard and cultural rituals were said to be inhibiting mothers from using safe child birth services (14,15,16).

1.2 Obstetric Determinants

Studies carried out in different parts of the world concerning maternal health care utilization had identified many factors related to pregnancy and child birth. Mothers who had lower age at first pregnancy, more than one previous pregnancy, birth order of more than one, received ANC service, birth complications in previous and immediate pregnancies, lower parity, having a history of obstetric complications, previous use of professionally assisted delivery are commonly found to be significantly associated with ANC and safe delivery service utilization (15,17,18,19).

1.3 Health service, woman's decision making and other factors

Factors preventing women in developing countries from seeking life-saving healthcare services they need include: distance from health facilities, household income, cost such as direct service fees as well as the fees associated with transportation, drugs and supplies, multiple demands on a woman's time and women's lack of decision-making power within the family (13,17).

The cultural perspective on the use of maternal health services suggests that medical need is determined not only by the presence of physical disease but also by cultural perceptiveness of the illness. Studies in rural Bangladesh showed the vast majorities believed that childbirth is an act of God and is a natural event. For this reason, they do not expect delivery complication or problems and therefore use TBAs for childbirth. Villagers also select TBAs because of tradition, convenience and special attention they receive. Traditional birth attendants (TBAs) are trusted, highly accessible and affordable members of the community (19).

A study conducted in rural Nigeria to assess barriers to the use of antenatal and obstetric care services showed that major barriers were economic, cultural and those related to the women's perception of their condition (20).

Quality of care is an important consideration in the decision to seek care. A study in the Guatemalan highlands, revealed that government health posts seemed to be conveniently located, yet that proximity did not guarantee utilization, probably the facilities understaffed and under equipped and thus unable to provide quality care (21).

II. Practice during pregnancy /ANC attendance

Antenatal care is important for safe motherhood. It provides couples appropriate counselling and information they need for safe pregnancy; provide an opportunity to inform women about the symptoms and danger signs for which assistance should be sought early from a health care provider thereby reducing the numbers and severity of pregnancy related complications. Besides, ANC clinics provide the opportunity to offer prophylactic treatments for some prevalent ailment like malaria and facilitates for the early detection and management, including prompt referral of pregnancy-related complications for specialist care (22).

Antenatal care (ANC) is an integral component of maternal and child health care. The purpose of ANC is to prepare the mother for child birth and in order to promote a favorable outcome for the mother and a child. While increasing evidence suggests that certain components of ANC, such as risk screening, have limited impact on reducing maternal morbidity and mortality there are a number of components of ANC interventions that have been found to be effective. In addition, ANC use has been shown to influence women's use of delivery services, probably the most effective intervention in reducing maternal mortality in the developing world (23).

Globally, every region has made progress in ensuring that women receive antenatal care at least once during their pregnancy. Even in sub-Saharan Africa, where the least progress has occurred, more than two thirds of women receive antenatal care at least one time during pregnancy (24).

Rwanda, one of the poorest countries in the world, is emerging as one of the nations with the best maternal health care systems in Africa. Rwanda has seen a substantial

improvement in maternal health recently. This success has partly hinged on a medical insurance scheme through which women can access medical facilities at nominal costs, and a government policy under which women deliver at no cost if they have completed four standard antenatal visits (25).

The new approach (by WHO), focused ANC recognizes that every pregnant woman is at risk for complications. In this model, four ANC visits are recommended for all pregnant women. Ideally, the first visit during first trimester; the second close to week 26; the third around week 32; and the fourth and final visit between 36 and 38 weeks (26).

A study on determinants of antenatal care utilization in Jimma town demonstrated that ANC utilization rate was 90.6%. ANC service nonusers were likely to be pregnant women who were illiterate and those who were student by occupation. It was also observed that pregnant women who did not use ANC services were likely to be those who think that the service is not important, those who consider that ANC service has no effect in reducing death and illness in the mother and baby and those pregnant women who intended to deliver at home (27).

According to a study done to assess antenatal care services in a rural training health centre in North west Ethiopia, 53.8% of pregnant women begin attending ANC in the second trimester of pregnancy and 45.9% begin ANC in the third trimester. Only one mother began attendance in her first trimester. Of the total mothers who attended ANC, 38.5% mothers visited the clinic only once, 27.7% two times and 14.3% three times (28).

A Community based study on the timing of prenatal care in Jimma town showed that 29% of women in Jimma town received inadequate prenatal care (19% did not attend antenatal clinics at all and 10% delayed the start of this care up to the third trimester of pregnancy) and only 26% started prenatal care within the first trimester. In analysis, low level of maternal education, inadequate household income, high parity, unplanned pregnancy, pregnancy that occurs out-of wedlock and husband's negative attitude

towards the services all significantly predicted the highest likelihood for late or no prenatal care (29).

Another community based study conducted to identify the influences of husbands' approval on women's use of prenatal care demonstrated; use of prenatal care varies substantially by whether the pregnancy was wanted and by husband's approval of prenatal care. Seventy seven percent of women who want their pregnancy were found to have used prenatal care compared to 62% of the women who did not want their pregnancy. Eighty percent of the women who reported that their husband approved of prenatal care actually used prenatal care services compared to only 40% of the women who reported their husband did not approve of prenatal care. Higher levels of education have association with a greater likelihood of using prenatal care (30).

III. Practices during Child birth/Safe delivery service utilization

The identifying and classifying the cause of mortality around delivery, and the dominance of haemorrhage, infections, and hypertensive disorders as causes of death mean that all women should have access to skilled attendants at birth and immediately after, and to timely referral for emergency care (31).

Supporting women at delivery is an essential part of public health care. Supporting women in labour has many advantages like having shorter labours, reduced need for oxytocin; analgesia, instrumental deliveries, and a decreased by 50% of CS. In addition, anxiety, postpartum depression, postpartum bleeding, postpartum fever, low Apgar score of neonates (<7 at 5 Minutes) can also be decreased (32).

Adequate delivery care can eliminate postpartum infection and prevent many deaths and illnesses from labour and delivery often determine whether pregnant women will survive the processes. It is estimated that better care during labour and delivery could prevent 50 to 80 percent of maternal deaths (22).

Increasing the proportion of deliveries with skilled attendance is widely regarded as key in reducing maternal mortality and morbidity in developing countries (33).

In Ethiopia, an overwhelming majority of births (94 %) were delivered at home with assistance of TBAs (28%), relatives (61%), or alone (5%). Five percent of births were delivered in a public facility and less than 1 percent of births were delivered in a private facility. According to EDHS 2005 only 6% of the deliveries were conducted by skill attendance in health facility (10).

Reports from MOH in 2007 showed that out of nearly 2.8 million expected deliveries in the year, only 16.4% took place at HFs. According to the report, Health Extension Workers (HEWs) attended about 7.3% of expected deliveries (34).

A study done on parturient' need of continuous labour support in labour wards in Addis Ababa three university hospitals showed, about 53% of them need to have a companion during labour. The reasons given for wanting companion were emotional (49.5%), information (25%) and physical (21.7%) supports. About 54% and 37% of women at labour need to have respectively their mothers and husbands as companions (35).

According to a study on Birth preparedness and complication readiness among women in Adigrat town, North Ethiopia, taking into account place of delivery identification, means of transportation and saving money, about 22% of the respondents were prepared for birth and its complication. In analysis, preparation for birth and its complication was higher among literate mothers, married women, women with parity range of 2 to 4, women with history of stillbirth and those who were advised about birth preparedness during their antenatal care follow up (36).

Study conducted to assess safe delivery service utilization among women of child bearing age in North Gondar Zone, North West Ethiopia, revealed that a total of 13.5% of mothers gave birth to their last babies in health facilities. Only about 25 of the rural women gave birth in the health institution. Untrained TBA and relatives attended 76.4% of the deliveries. This community based study indicated women who did not have any

registered antenatal visit were less likely to give birth at health facilities (OR 0.09, 95% CI: 0.06,0.15) than those received antenatal care. Based on this study traditional harmful practices related to labour and child birth was identified. Out of the 257 urban women who gave birth at home, the majority (73.2%) tied the cord with un-boiled thread and 12.1% left the cord untied. About 66.2% of rural and 45.3% of urban respondents applied butter on the umbilical stump. Only 50(12.2%) urban women and 324(39%) rural women practiced abdominal massage during labour. The reported reasons for not using institutional delivery were absence of health problems, short duration of labour, preferring the attention of relatives and trust on traditional birth attendance (37).

According to the National Committee on Traditional Practices of Ethiopia survey report; more than 140 types of HTPs have been identified by the survey. The occurrence of major HTPs that affect the health of the female population specifically that are practiced around labor and childbirth include massaging of the abdomen of pregnant women (73.35%), shaking in prolonged labor (41.4%), drastic measure to hasten placenta (70.6%), and bleeding after expulsion of placenta (47.5%) (38).

IV. Roles of HEWs in the provision of maternal health care services

Reviewing the role of HEWs in line with women's practice is needed because 85% of the Ethiopian population is living in rural areas where potential health services are covered by health posts which are run by health extension workers.

Health service extension program (HSEP) helps to attain the MDGs. HSEP is introduced in our country as one of the key components in HSDPII. The core of HSEP is to provide a list of essential health services to households at the kebele level. Human resource involves the use of HEWs to deliver 16 packages in four main areas including as hygiene and environmental sanitation, disease prevention and control, family health services and health education and communication on outreach basis. Although conducting normal deliveries is considered one of the responsibilities of the HEWs, their 'midwifery' skills have not been built very well during the one year basic training. The previous frontline volunteer workers (CHA, TBAs, CBRHAs) will be incorporated in the system under the

guidance and supervision of the HEWs. The relationship between communities based health workers in most kebeles are not clearly established yet. Based on previous study highest portion of health extension workers time is spent on health education, followed by environment health. Very little time is used for community documentation, family health and diseases control and prevention (39).

According to the Lancet 2008 world report, thousands of community workers are helping Ethiopia to deliver primary health-care services to people living in rural areas. But critics say the training these workers received is not adequate for them to attend many of the health problems they encountered. Although Ethiopia still has some of the worst health indicators in the world, it is fast registering impressive successes in extending affordable primary health-care services across the country. These achievements are largely attributable to the health extension programme which has been implemented since 2003, and through which the country hopes to achieve universal access to primary health care by 2009 (40).

According to a study done to assess the working conditions of HEWs in Ethiopia, no delivery service by HEWs was reported in the study woredas even though a number of health posts have delivery kits and couches. This may be related to the fact that very few deliveries are brought to the health facilities in general. There is also competition from TBA in home delivery and probably most HEW don't feel confident enough to undertake delivery independently because of limited practice during the training (41).

Therefore, this study attempted to identify common maternal practices (both modern maternal health care utilization and traditional practices) during pregnancy and childbirth in line with HEWs role in the provision of maternal health care.

A conceptual framework was used to describe interrelated factors that determine maternal ANC and HF delivery service utilization (see figure 1).

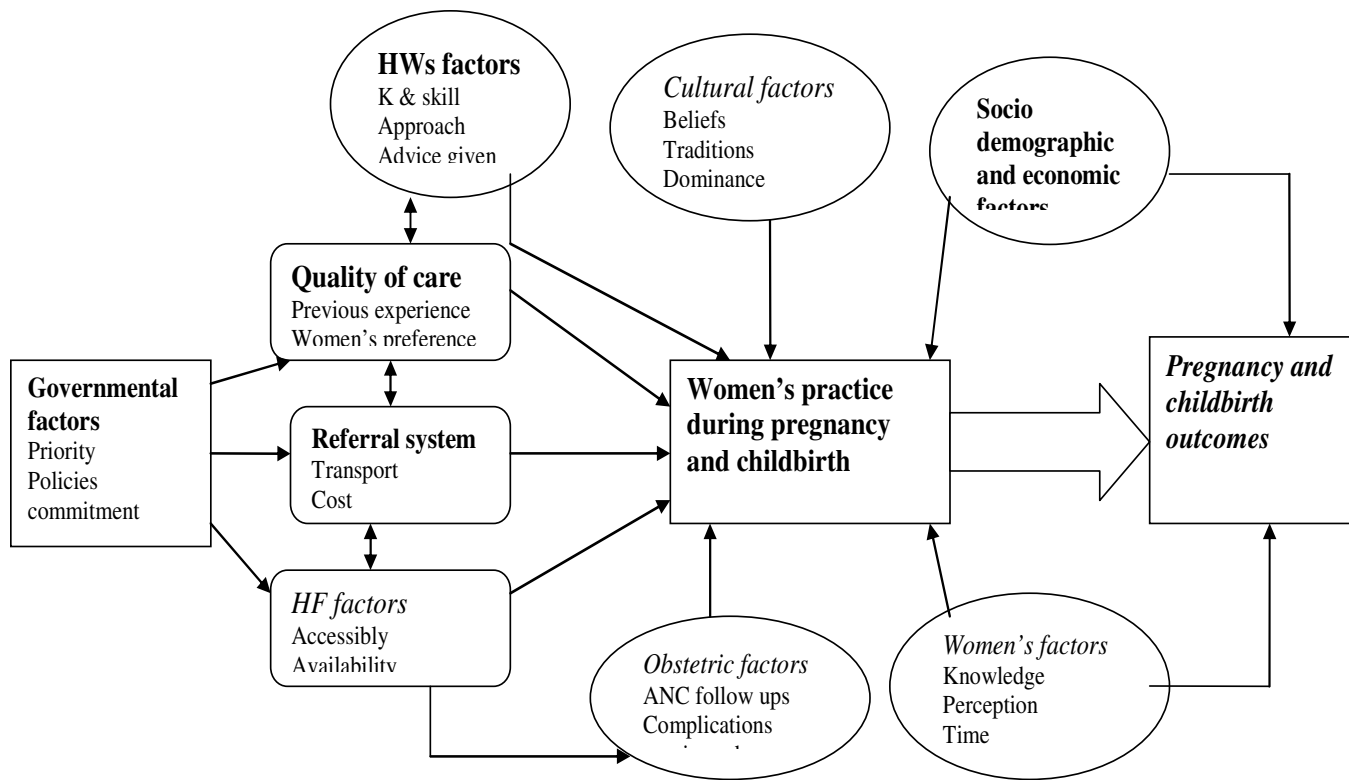


Fig1. Conceptual framework on factors that affect women's practice during pregnancy and childbirth

3. Objective

General objective

- ❖ To assess practices of women during pregnancy and child birth with the perspective of HEWs' role in Gubalafto Woreda, North Wollo Zone, ANRS, Ethiopia.

Specific objectives

- To describe women's common practices during pregnancy and childbirth;
- To determine factors influencing ANC and safe delivery service utilization;
- To measure the roles of HEWs on pregnancy and childbirth practices of women.

4. Methods

4.1 Study area and period

The study was conducted in North Wollo zone, one of the 11 zones in ANRS. It is located North-East of the region, bordered by Debubawi zoba of Tigray region, South Wollo and South Gonder. The capital of the zone is Woldia town which is 521kms North of Addis Ababa and 355Kms East of the regional capital Bahirdar. The study area is Gubalafto district which is among the 13 districts in the Zone and is located surrounding Woldia town. Based on 1999 National census, the projected population of the district for 2001 is around 160,351; out of which 95% of the population are residing in rural areas.

For the total 32 kebeles in the woreda, there are 4 health centres (2 growing) and 33 health posts that provide health care services to the community. In this woreda there are 65 HEWs who are working in the health posts and rarely in the growing HCs. Malaria, tuberculosis, malnutrition, HIV/AIDS are among the main health problems in the district. The study was conducted from January to February 2009. Annual report of North Wollo Zone of ANRS indicated that 73.4%, 85.2% of the women reported to use currently any kind of family planning for the Zone and for the study Woreda respectively. The report also showed that ANC (63.8%, 63.7 %,) HFs delivery (25.5%, 29.6%) and postnatal care (33.9%, 29.0%) coverage for the Zone and for the study Woreda respectively (42).

4.2. Study design

Community based cross sectional house hold survey was carried out among pregnant and lactating women using data collected through a quantitative approach supplemented by a qualitative in-depth interview and FGD.

4.3. Source and study population

Source population: All child bearing age women who are permanent residents of the study area.

Study population: All CBAW who had given at least one live birth and who were pregnant and or lactating during the survey.

Study subjects: Pregnant and lactating women included in the sample.

Study unit: Individual woman

4.3.1. Inclusion criteria.

- Women whose menstruation was absent for at least the last three months and who had given at least one live birth before. This is because, pregnancy especially, in the rural community is not identified by seeking pregnancy test. So woman who has been experienced in this way can tell whether she is pregnant or not usually after three months of conception.
- Women with under one year children. This is to minimize recall bias.
- Willing to participate and able to communicate in the study.

4.3.2. Exclusion criteria

- Those who did not full fill the inclusion criteria.

4.4. Sample size determination

The sample size was determined using the formula for single population proportion.

$$n = \frac{(Z_{\alpha/2})^2 P (1- P)}{d^2}$$

Where:

n = the desired sample size

P = the proportion of women with joint practices (this means women's practice for ANC, and safe delivery as well as traditional practices) for different maternal health services during pregnancy and childbirth = 50 % (to obtain a maximum sample size and since there was no previous study conducted on each practice in the study area).

Z $\alpha/2$ = Critical value at 95% confidence level of certainty (1.96)

d = the margin of error between the sample and the population = 5%

The calculated sample was 384 plus a non-response rate of 10% = 422.4, plus considering a design effect of 2 (422.4x2), a total of **845** women were required.

4.5 Sampling technique.

The study was conducted in Gubalafto Woreda, North Wollo Zone. For the quantitative data, the study employed multistage cluster sampling scheme. Based on the catchment's areas of each 4 health centers in the district (since these health centers are assumed to be

distributed evenly in the district), all rural Kebeles in the district were grouped in to four groups (clusters). First, for logistic reason, out of the total 30 rural kebeles in the district, 8 kebeles (2 kebeles from each cluster) were selected randomly by lottery method. The total sample size was distributed across the selected Kebeles with a probability proportional to size. Secondly, to identify the n^{th} number of households (HHs), systematic random sampling was employed. Then, after selecting random starting point, eligible individuals within each selected household were listed and one of them randomly selected and interviewed. For HHs with no eligible member, the immediate next HH was included. Two data collectors per kebele had visited every selected HHs from starting point until the required number of participants of the kebele was completed. For qualitative design, non probability purposive sampling technique was employed.

4.6 Data collection procedure

4.6.1 Quantitative part

Structured questionnaire was prepared in English and translated into Amharic language and then back translated to English by different people and was used in the data collection of the quantitative survey.

Prior to the actual data collection, the questionnaire was pre-tested on similar populations in the rural community of other district of the same Zone using 5% of the sample sizes and necessary corrections were incorporated accordingly.

Sixteen data collectors (who had completed grade 10-12) and four nurse supervisors were selected from the community and health centres and they were trained on data collection and supervision for three consecutive days by the Principal Investigator. Supervisors also had served as qualitative data collection moderators.

The responsibility of the data collectors was to fill questionnaires after obtaining verbal consent of the subjects. The Supervisors provided all items necessary for data collection on each data collection day, checked filled questionnaire for completeness, solved problems which had rose during data collection. The Principal Investigator was in the

study area till completion of data collection for an overall supervision towards ensuring quality data collection.

Finally, the filled questionnaires were collected, checked, analysed and securely handled by the Principal Investigator.

4.6.2 Qualitative part

Complementary to the quantitative part, qualitative method also was carried out in order to gather more information that might not be captured by quantitative part of the study alone. FGD moderators had explained the purpose of the study and obtain voluntary informed consent prior to conducting the discussions. One FGD with community leaders in each of the eight kebeles was carried out. The in-depth interview (ID) was aimed at assessing the role of HEWs in the provision of maternal health care services like ANC and normal delivery. Ten HEWs in the selected eight kebeles were included. For the in-depth interview and the FGD, semi structured questionnaire was used to guide the session. The Principal Investigator was involved in some of the in-depth interviews.

4.7 Data quality management

To ensure the external validity (generalizability) of the study, appropriate size and representative type of study units were selected. And to ensure the internal validity (accuracy and precision) of the study, maximum effort was applied to minimize bias and chances using the following strategies:

Pre-testing was conducted prior to data collection process. Based on the pre-test, questions were revised, edited and adapted after necessary modification.

Questionnaires were translated into Amharic then back to English by different individuals for insuring their consistency. During data entry – Data was entered using the Epi-Info version 6.04 soft ware package by the Principal Investigator and an experienced data clerk. The data entered was cross checked and corrected (if any) prior to actual analysis.

Three days training was given for data collectors and supervisors. The issue of confidentiality and privacy was stressed in much depth during the training session.

Representative sample size was taken by considering the design effect as 2. Recall and selection bias were minimized by involving lactating mothers with under one children and by using random sampling technique.

4.8 Data analysis procedure

For data processing and analysis recent versions of Epi-Info and SPSS were used.

Data was checked for completeness and consistency. Coded data was entered into computer programs after the required cleaning was done. Frequency distribution tables were used to describe most of the findings and graphs were also plotted for some accordingly. And other descriptive summaries were calculated. Univariate and then multivariate analysis was carried out. Odds ratio with confidence intervals and p-values was calculated and tests of association for categorical variables were made. For all statistical tests, the decision was significant if the p-value is < 0.05 . A logistic regression test to control confounding variables and identify major factors influencing utilization of maternal health care was carried. The results of the survey were triangulated with the results from the interviews and focus group discussions.

4.9 Study variables

Dependent Variables

- ANC practices/attendance
- Preference of place of delivery

Independent variables

- * Socio-economic and demographic factors such as age, education, marital status, religion, ethnicity, income, occupation.
- * ANC follow up and other obstetric factors
- * Accessibility and availability of health services
- * Traditional practices
- * Perception of risks
- * Decision making status of the woman
- * Skill and approach of health workers
- * Satisfaction with service given

* Transportation and referral system

4.10 Operational definitions

Current pregnancy: Woman whose menstruation is absent at least for the last three months before the data collection period and who was able to tell as she is pregnant.

Health extension workers: Female health workers, who are working at health post (the smallest level of health institution) after getting one year health science training.

Lactating woman: A woman who currently breast feeds her less than one year child.

Practice: Any woman's usual activities or behaviours in relation to normal and complications of pregnancy, labour/ childbirth and postpartum period.

Recently gave birth: Women who gave birth within the last 12 months, including stillbirth.

Safe delivery: Delivery where the attendant monitors progress of labour to avoid and manage complications those which may endanger the wellbeing of both the mother and new born.

Severe/ serious health problems: A subjective description given for a health problem encountered during pregnancy and childbirth by a woman to differentiate such problems from the usual less severe/serious health problems like headache, minimal vaginal bleeding after delivery.

Skilled provider: Persons with midwifery skills (physicians, health officers, nurses/midwives) who can manage normal deliveries, diagnosis, and manage or refer obstetric complications.

Traditional birth attendant (TBA): A traditional birth attendant who initially acquired her skills by delivering babies herself or through apprenticeship to other TBAs.

Tradition practice: Is a habitual or customary performance or operation of statements, beliefs, legends, customs etc. by the individual or community which are handed down from generation to generation.

Trained traditional birth attendant (TTBA): A TBA who has received a short course of training, usually of three months through the modern health care sector, to upgrade her skills.

4.11 Ethical considerations

Ethical clearance was obtained from SPH, Addis Ababa University, institutional review board (IRB) before the start of the field work. An official letter of co-operation was written to Gubalafto District Administrative Office and to the North Wollo ZHD from SPH, FOM, of AAU. The District Administrator, in turn, wrote an Official letter of co-operation to respective bodies including Kebele Administrative Offices. The interviewers got an informed verbal consent from the study subjects prior to the study. Moreover, all the study participants were informed verbally about the purpose and benefit of the study along with their right to refuse and the study participants were assured for an attainment of confidentiality for the information obtained from them.

4.12 Dissemination of results

After the research paper got approved by the advisor and other responsible bodies of the SPH, FOM, of AAU, through Graduate Coordinator of SPH, it will be disseminated to the MOH, EPHA, to Gubalafto Woreda Health Offices and North Wollo ZHD of ANRS and to those governmental and non governmental organizations that potentially could benefit from the study.

5. Result

A total of 841 respondents (two hundred fifty seven pregnant women and five hundred eighty four lactating mothers) were interviewed to assess about their comprehensive maternal health care practices giving a response rate of 99.5 percent.

5.1 Socio-demographic characteristics of the respondents

Four hundred five respondents (48.2%) were under the age category of 25-34yrs with mean $\pm$ (SD) of 31.1 $\pm$ (6.9) years. Eight hundred thirty eight (99.6%), of the respondents belong to Amhara ethnicity. Seven hundred fifty six (89.9%) were currently married and the rest unmarried. Among the respondents, the majority, 678 (80.6%) were Orthodox Christians.

The majority of the respondents, 567 (67.4%) have never attended any formal education (are illiterate), 224 (26.6%) of them were able to read and write and only 40 (4.8%) and 10 (1.2%) were identified as having primary and secondary education respectively. Being rural dwellers, 784 (93.2%) were farmers and only 21 (2.5%) were merchants by occupation. Regarding family size of respondents, 472 (56.0%) and 293 (34.8%) of them had reported a family size of 3-5 and 6 or more respectively. Among the respondents who were able to estimate their HH monthly income, 265(44.4%) have reported <150 ETB as their monthly income. Socio demographic characteristics of respondents are summarized in Table1.

Table 1: Socio demographic characteristics of the sampled women, Gubalafto Weoreda, North Wollo Zone, ANRS, Ethiopia, March 2009 (n=841)

Variables	Frequency	Percent
Age at interview(yrs)		
15-19	25	3.0
20-24	126	15.0
25-29	225	26.7
30-34	180	21.4
35-39	164	19.5
40-44	90	10.7
≥ 45	31	3.7
Religion		
Orthodox	678	80.6
Muslim	162	19.4
Protestant	1	0.1
Marital status		
Never married	23	2.7
Currently married	756	89.9
Separated	33	3.9
Widowed	15	1.8
Divorced	14	1.7
Family size		
<3	77	9.2
3-5	471	56.0
6 or more	293	34.8
Educational status		
Illiterate	567	67.4
Read and write	224	26.6
Primary	40	4.8
Secondary and above	10	1.2
Occupation		
Gov. employed	6	0.7
Student	23	2.7
Farmer	784	93.2
Merchant	21	2.5
Others	7	0.8
Income		
<150	265	31.5
150-650	192	22.8
651-1400	90	10.7
1401 and above	50	5.9
Unable to estimate	244	29.0

5.2 Obstetric characteristics of the respondents

Fifty six, 6.7% of the respondents were below 15 years at their first pregnancy. Furthermore, the majority, 59.0%, of the women were below 20 years at their first pregnancy with mean $\pm$ (SD) of $18.8 \pm (3.7)$ and median age of 18.0 years. Regarding their pregnancy profile, 35.4% of the respondents had been pregnant 4-5 times and 14% of them six or more times in their life to the interview date.

Last pregnancy were not planned by 218 (25.9%) of the respondents. Among the respondents who had encountered bad obstetric outcomes, so far, 86 (10.2%) had reported abortion and 102 (12.1%) reported stillbirth, while 19 (2.3%) and 36 (4.3%) of the respondents had encountered abortion and still birth during the last pregnancy respectively. The majority, 63.4%, of the respondents had received ANC at least once and 23.5% had four or more visits during their last pregnancy. Of the 278 respondents who faced serious health problems during pregnancy, severe headache (27.7%) and severe weakness (26.7%) had accounted the highest proportion.

Seven hundred seventy, 91.6% of the mothers had given birth at home and only 71 (8.4%) gave birth in the health facility. Labor lasting > 12 hours for multipara and >18 hours for primipara (46.9%) and severe vaginal bleeding (30.3%) were among the highest serious health problems that the mothers had experienced during the last child birth. Pertinent to immediate complications following delivery, 275 (32.7%) mothers experienced serious health problems ((table 2).

Table 2: Obstetric characteristics of the sampled women, Gubalafto Wereda, North Wollo Zone, ANRS, Ethiopia, March 2009 (n=841)

Variables	Frequency	Percent
Age at first pregnancy		
<15 years	56	6.7
15-19 years	496	59.0
>20 years	289	34.3
Mean $\pm$ SD	18.8 $\pm$ 3.7	
Gravidity		
Two	201	23.9
Three	225	26.6
Four	167	19.6
Five	130	15.5
Six and above	118	14.0
Last pregnancy planed		
Yes	623	74.1
No	218	25.9
History of ever abortion		
Yes	86	10.2
No	755	89.8
History of ever still birth		
Yes	102	12.1
No	739	87.9
Received ANC (last pregnancy)		
Yes	533	63.4
No	308	36.4
ANC frequency (last pregnancy)		
Only one	69	13.0
2-3 times	339	63.6
4 and above	125	23.4
Place of delivery (last pregnancy)		
Home	770	91.6
Health facility	71	8.4
Immediate complications for the last childbirth		
Yes	275	32.7
No	566	67.2
Outcome of last pregnancy		
Live birth	786	93.5
Still birth	36	4.3
Abortion	19	2.3

5.3 Maternal health care utilization

5.3.1 Practices related to the current/last pregnancy

Of the total 533(63.4%) respondents who had attended antenatal care during their last pregnancy, only 8(1.5%) started ANC during the first trimester and the majority, 399 (74.9%) attended ANC only during the third trimester. Health centers were the place where in majority of the respondents (54.4%) had attended their ANC, followed by health posts where in 40.5% of them attended ANC. Concerning the number of ANC received, Two to three times follow up were the highest visits (63.6%) that respondents had made. More than half percent of the respondents (52.9%) were first seen by the nurses / midwives for ANC and 42.8% were seen by HEWs (Table3).

Table 3. Frequency and timing of antenatal care, Gubalafto Woreda, North Wollo Zone, ANRS, Ethiopia, March 2009.

Variables	Frequency	Percent
Number of visits		
Only once	69	12.9
Two to three times	339	63.6
Four	73	13.7
Five and above	52	9.8
Months pregnant at first visit		
1-3 months	8	1.5
4-6 months	125	23.5
7-9 months	399	74.9
Do not remember	1	0.2
Place of attendance		
Hospital	21	3.9
Health center	290	54.4
Health post	216	40.5
Others	6	1.1
First attended by		
Doctor	5	0.9
Health officer	9	1.7
Nurse/midwife	282	52.9
T/TBA	7	1.3
HEWs	228	42.8
Did not remember	2	0.4

In relation to ANC follow up, the need of TT immunization (46.2%), the importance of nutrition (43.3%) and VCT (37.7%) during pregnancy was the three common advices given by the health workers for ANC attendants. Additionally a substantial number of study subjects got advice on danger signs of serious health problems during pregnancy, childbirth, or soon after birth, where to go if encountered serious health problems, arrangements for transportation and health professionals. But only 52(9.8%) of the respondents got advice where to give birth to their baby. (The cumulative percentage is more than 100% due to multiple responses and it may follow similar trend for other similar figures across the pages).

The main reasons given by the respondents, for not attending antenatal care during their last pregnancy includes: no problem was faced during prior pregnancy (30.8%), lack of money (24.7%) and the health facility being too far (23.3%). Other reasons that were mentioned by respondents (other than those depicted in fig1) for non attendance include:- no one to accompany, no good service, long waiting time, unhappiness from the previous service delivery, husband did not allow, low belief about effectiveness of ANC, no child care support at home. Figure1 shows the different reasons mentioned by respondents for not attending antenatal care.

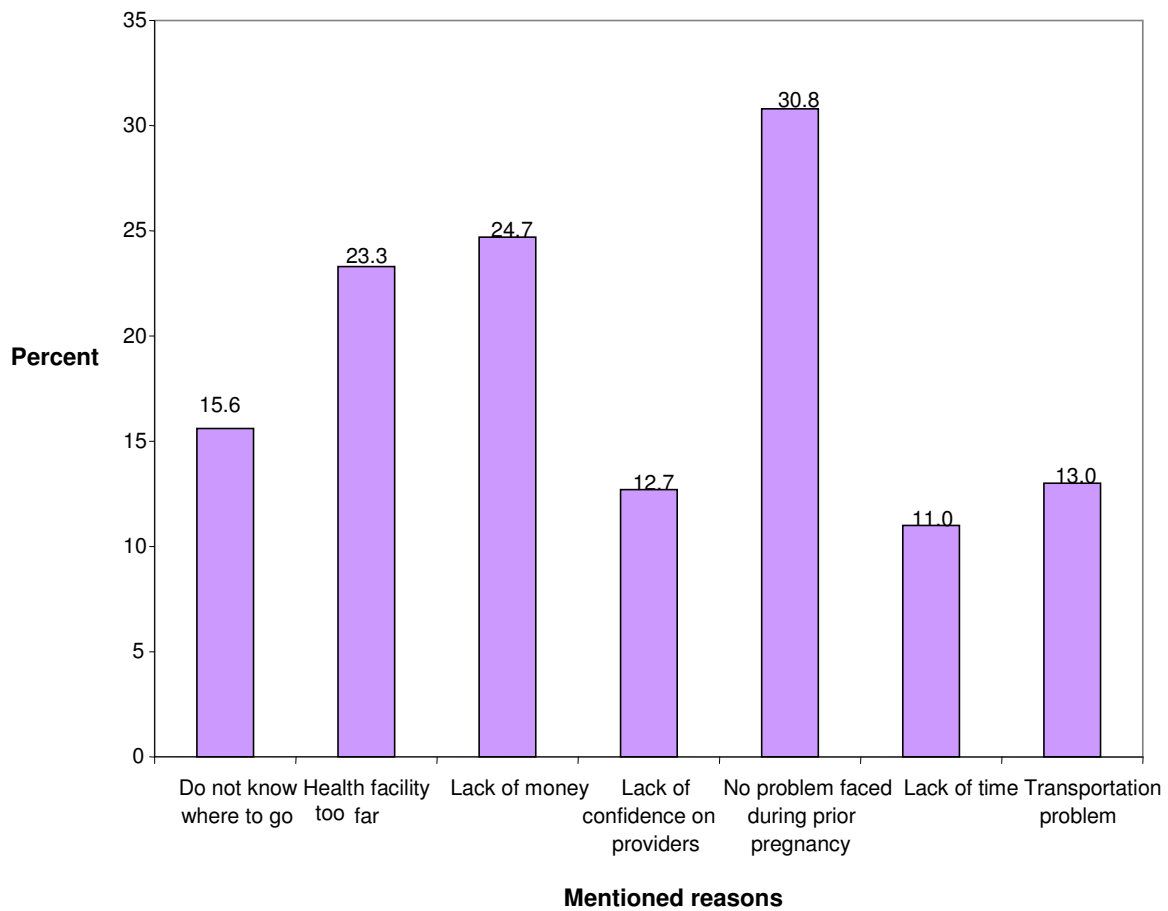


Fig2. Main reasons mentioned for not attending ANC in Gubalafto Woreda, North Wollo Zone, ANRS, Ethiopia, 2009.

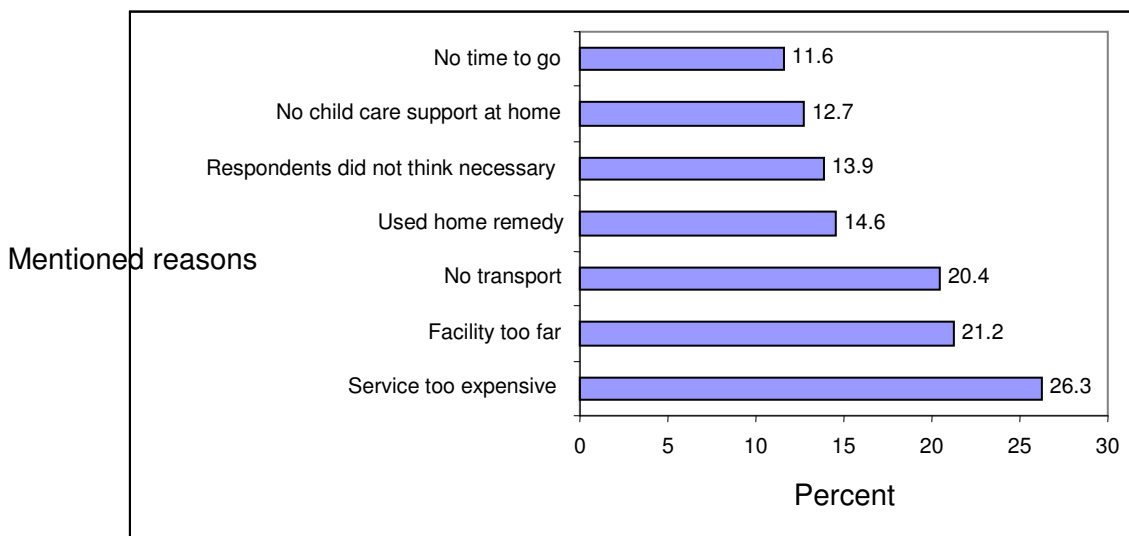
Socio-demographic characteristics of respondents like maternal age, religion, marital status, level of school etc were cross tabulated with ANC attendance to see which categories of the factors more favors ANC attendance (depicted in table4).

Table 4: Distribution of the ANC attendance of the study population by their socio-demographic factors, Gubalafto Wereda, North Wollo, ANRS. March 2009 (n=841)

Variables	ANC attendance			
	Yes	%	No	%
Maternal Age				
15-24	97	11.5	54	6.4
25-34	268	31.9	137	16.3
35-44	156	18.5	98	11.5
44+	12	1.4	19	2.2
Religion				
Orthodox	406	48.3	272	32.3
Muslim	126	15.0	36	4.3
Protestant	0	0	1	0.1
Marital status				
Currently unmarried	42	5.0	43	5.1
Currently married	491	58.4	265	31.5
Family size				
<3	44	5.2	33	3.9
3-5	326	38.8	145	17.2
Six and above	163	19.4	130	15.4
Level of school				
Illiterate	329	39.1	238	28.3
Read and write only	171	15.6	53	6.3
Primary	26	3.1	14	1.7
Secondary	7	0.8	3	0.4
Occupation				
Farmer	501	59.6	283	33.6
Merchant	14	1.7	7	0.8
Student	10	1.2	13	1.5
Others	8	1.0	5	0.6
Income				
<150	176	20.9	89	10.6
150-650	142	16.9	50	5.9
651-1400	63	7.5	27	3.2
1401 and above	33	3.9	17	2.02
Unable to estimate	119	14.1	125	14.9

Two hundred seventy eight (33.1%) respondents had reported as they have encountered serious health problems related to the current/last pregnancy. Severe headache 77(27.7%), severe weakness and 74 (26.6%), and vaginal bleeding 59 (21.2%) were among the major pregnancy related serious health problems mentioned by respondents. Some respondents also mentioned high fever, blurred vision, convulsion, swollen hands/face, loss of consciousness, difficulty of breathing, severe abdominal pain and accelerated or reduced fetal movement as the health problems that they had encountered during pregnancy. However, only 132 (47.5%) of these respondents had sought modern health care assistance; and among those who sought assistant for the problem, 93 (70.5%) went to health facility mostly to health post (60.2%) followed by governmental health center (29.0%) and the rest visited governmental hospital and private clinic.

Main reasons given by respondents for not seeking assistance/ taking measure were service too expensive (26.3%), facility too far (21.2%), used home remedy (14.6%) and respondents did not think necessary (13.9%) (figure3). Joint, respondent and husband together accounted the largest proportion (55.0%) in making the final decision about whether or not to seek assistance/ take measure for this problem followed by respondent (30.9%), husband alone (8.6%) and 3.2% grand mother and the rest by others.



Fif 3. Reasons mentioned by respondents for not seeking assistant/ taking measure for serious health problems that encountered during pregnancy, Gubalafto Woreda, North Wollo zone, ANRS, Ethiopia, 2009.

5.3.2 Practices related to the last child birth

Of the total respondents, only 71 (8.4%) gave birth in the health facility for their last pregnancy of which 27 (3.2%) gave birth in health center, 30 (3.6%) in the health post, Hospital 13 (1.5%), private clinic 1(0.1%). The rest 770 (91.6%) gave birth in the home, commonly at the respondent's home. During the last labor and childbirth, 189 (22.5%), 162 (19.3%), 98 (11.6%) of the respondents had had experienced abdominal massage, shaking, and drastic measures (is a forceful pulling and application of pressure to remove engaged part usually placenta, in Amharic 'behaile goteto mawutat') respectively. Additionally, another 12 (1.4%) of respondents had experienced traditional practices like inserting herbs/other materials in to the birth canal and administering traditionally prepared medicines.

The reasons mentioned for doing harmful traditional practices were to correct the position of presenting part 183 (39.7 %), and in 67 (14.5%) because it is traditionally believed as good (figures 4).

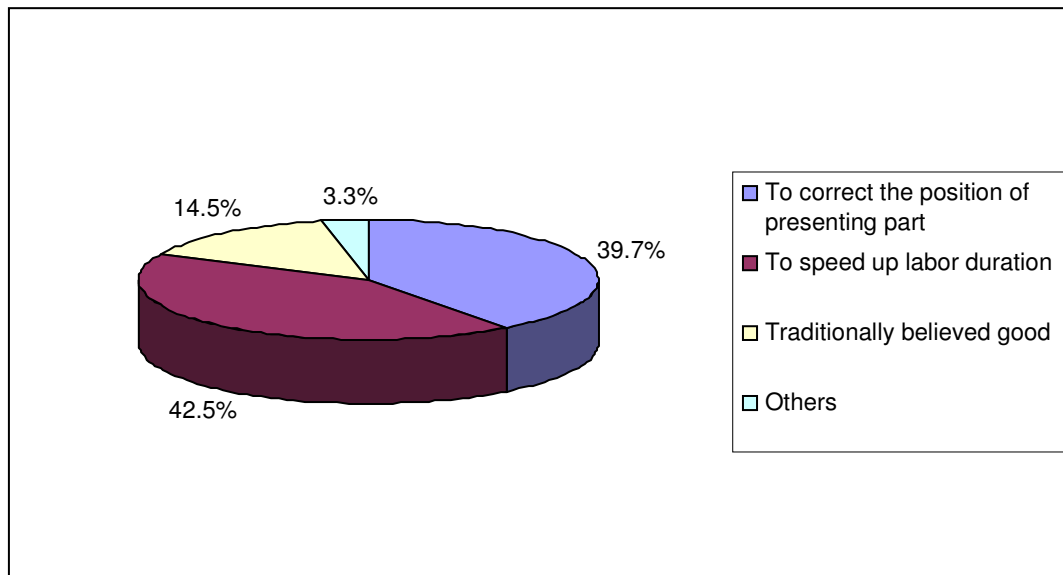


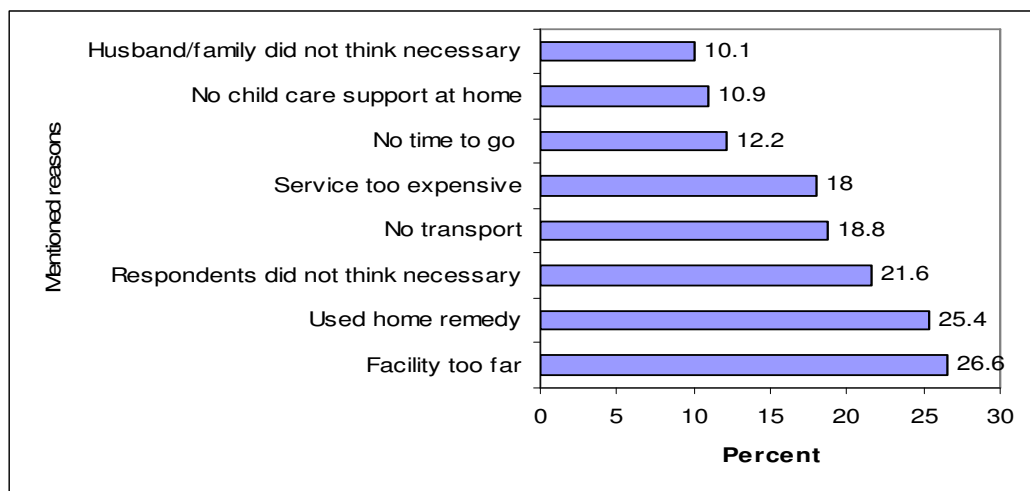
Fig4. Reasons given by the respondents for doing harmful traditional practices in the study area, 2009.

Others include: to decrease labor pain, to stop bleeding, and to remove remnant parts.

Concerning preparedness made during pregnancy, 27.5% of respondents / their family members had made arrangement prior to the last childbirth commonly by preparing essential items for clean delivery, saving money and identifying place of delivery.

Respondent and husband were the major final decision makers to have had arrangements for the birth of the child and where to give birth. For those who gave birth in the health facility, husband (53.5%), and mother (19.7%) were the persons who accompanied the respondents as well as other family members and neighbors were also mentioned.

Two hundred forty one (28.7%) respondents had reported to have had serious/severe health problems during their last childbirth (based on their subjective verbalization). Of these, 113 (46.9%) of mothers experienced labor lasting >12/18 hours followed by severe vaginal bleeding, 73 (30.3%). A substantial number of respondents also experienced high fever, severe headache and convulsion, 22.8%, 21.6% and 20.7% respectively during their last childbirth and most of them were in their home while they developed these problems. Of the total mothers with the problems (241), only 92 (39.1%) had sought some kind of assistance and of these, again, only 60 (62.7%) of them had went to the health facility and got treatment mostly in health center and health post. Main reasons given by the respondents for not seeking assistance/treatment were health facility too far (26.6%), used home remedy (25.4%) and respondent did not think necessary (21.6%) (fig5).



Fif 5. Reasons mentioned by respondents for not seeking assistant for serious health problems that encountered during childbirth, Gubalafto Woreda, North Wollo zone, ANRS, Ethiopia, 2009.

Most of the respondents reported to have got assisted by their family 332 (39.5%) and T/TBA 284 (33.8%) in case of home delivery and by HEWs 33(3.9%) and nurses / midwives 19 (2.3%) in health facility delivery and the rest by other relatives and health workers. Of the many options provided to identify reasons for home delivery; previous home delivery was normal 196(25.5%), told pregnancy was normal 191(24.8), presence of TBAs/trust on TBAs 130 (16.9%) were the dominant reasons mentioned by respondents for not delivering in the health facility (figure 6).

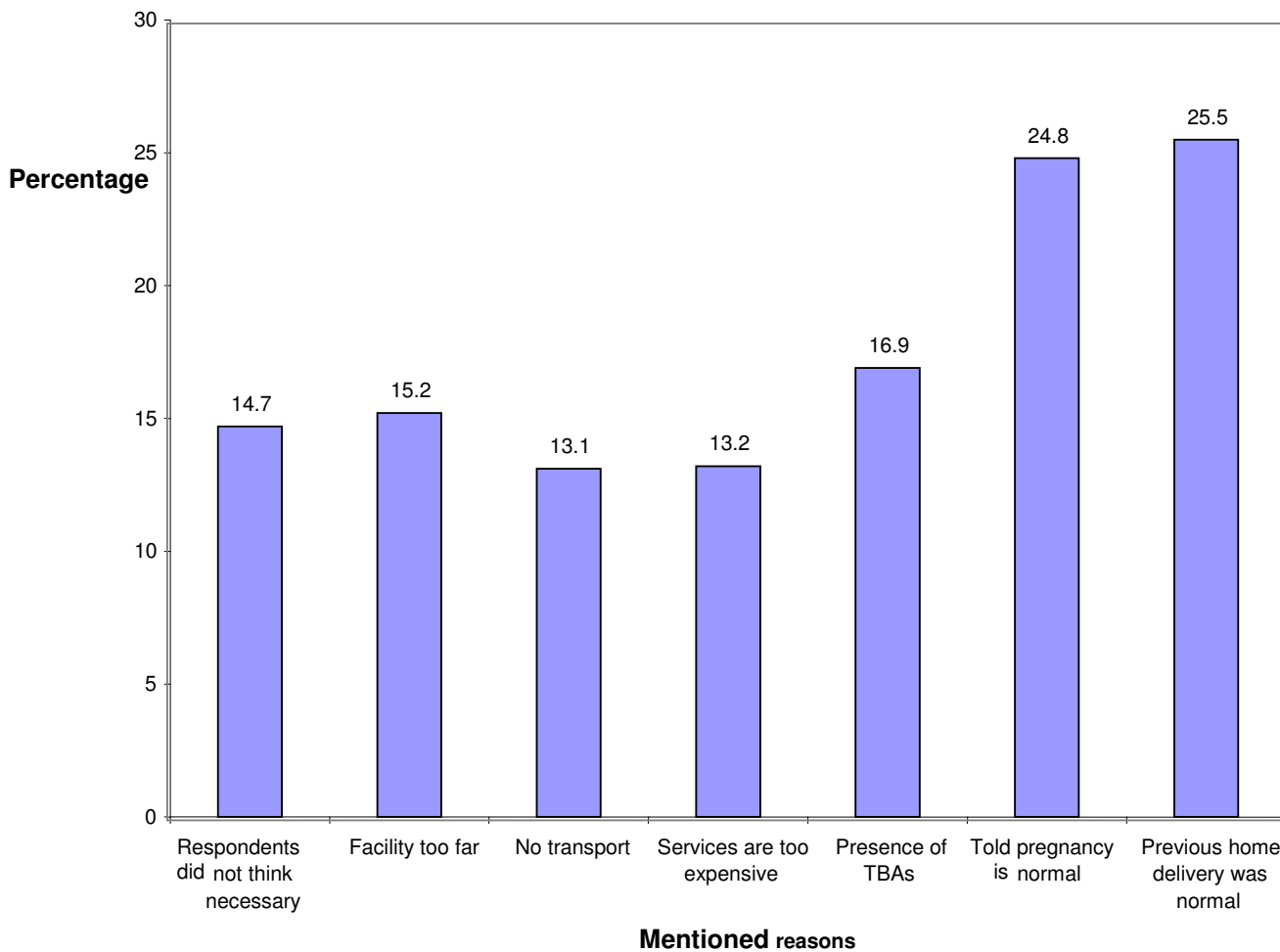


Fig 6. Reasons mentioned by the respondents for not giving birth in the health facility in Gubalafto Woreda, North Wollo, ANRS, Ethiopia, March 2009.

Socio-demographic characteristics of respondents like maternal age, religion, marital status, level of school etc were cross tabulated with HF delivery to see which categories of the factors more favors HF delivery (depicted in table5).

Table 5: Distribution of socio demographic factors with preference of delivery place by the study population, Gubalafto District, North Wollo zone, ANRS. Ethiopia, March 2009 (n=841)

Variables	Preference of delivery place			
	Health facility		Home	
	No	%	No	%
Age				
15-24	15	1.8	132	17.1
25-34	34	4.2	371	44.1
35-44	20	2.4	238	28.3
44+	29	3.4	2	0.4
Ethnicity				
Amhara	71	8.4	767	91.2
Tigræ	0	0	3	0.4
Religion				
Orthodox	50	5.9	628	74.7
Muslim	21	2.5	141	16.9
Protestant	0	0	1	0.1
Marital status				
Currently Un married	5	.6	80	9.5
Currently Married	66	7.8	690	82.0
Family size				
<3	10	1.2	67	8.0
3-5	37	4.4	434	51.6
6 or above	24	2.8	269	32.0
Educational status				
Illiterate	527	62.7	40	4.8
Read and write	200	23.8	24	2.8
Primary	35	4.2	5	0.6
Secondary and above	8	0.9	2	0.2
Occupation				
Gov.employed	1	0.1	5	0.6
Student	20	2.4	3	0.4
Farmer	722	85.5	62	4
Merchant	16	1.9	5	0.6
Others	2	0.2	1	0.1

5.3.3 Practices related to immediate post partum period

Two hundred seventy five (32.7%) of the respondents reported to have had experienced serious health problems related to the birth after delivery. Severe vaginal bleeding is one of the major health problems they faced after delivery accounting for 35.6%. Retained placenta is another prevalent problem responsible for 26.9% of postpartum morbidity among respondents followed by convulsion (12.4%) and high fever (10.5%). The rest with small proportion of the problem reported to have had loss of consciousness, retained placenta, incontinent and offensive vaginal discharge. But only less than half percent (46.7%) of the respondents had sought some kind of assistance for these problems.

Seven hundred eighty six (93.5%) of the respondents gave live births for their last delivery, the rest 36 (4.3%), and 19 (2.3%) were still births and abortion respectively.

For the live births, 75.6 % and 13.8% of the mother used new/boiled razor blade and unboiled razor blade to cut the umbilical cord respectively. A substantial number of respondents, 298 (38.4%), did not tie the cord after delivery. One hundred fifty nine (20.5%) of the respondents had applied some materials to the umbilical cord of the new born, commonly butter (75.5%) followed by mud (10.1%). Almost half of the respondents (50.8%) gave butter and other liquids to the new born baby and 398 (51.3%) of the respondents put their baby to the breast longer than one hour after delivery (table6).

Table6: Prevalence of traditional practices during childbirth and immediately after labor, Gubalafto Woreda, North Wollo Zone, ANRS, Ethiopia, March 2009

Variables	Frequency	Percent
Abdominal massage (n=841)		
Yes	189	22.5
No	652	77.5
Shaking (841)		
Yes	162	19.3
No	679	80.7
Drastic measures (841)		
Yes	98	11.7
No	743	88.3
Material used to cut umbilical cord (776)		
New/boiled razor blade	652	77.5
Used/un boiled razor blade	107	12.7□
Un boiled scissor	14	1.7
Knife	41	4.9
Other material	27	3.2
Umbilical cord tied after delivery (776)		
Yes	478	61.6
No	298	38.4
Material applied to the stamp (776)		
Yes	159	20.5
No	568	73.2
Do not remember	49	6.3
Butter and other fluid given to the new born baby (776)		
Yes	394	50.8
No	339	43.7
Do not remember	43	5.5
Put their baby to the breast longer than one hour after delivery		
Yes	398	51.3
No	443	49.7
Used home made remedy for health problem experienced during labor (241)		
Yes	62	25.7
No	179	74.3

5.3.4 Women's perception towards HEWs' role in family health service provision and health service utilization

Seven hundred forty nine (89.1%) and 698 (83.0%) of respondents had thought that a woman might experience additional health risks during pregnancy and childbirth, and giving birth at home has risks respectively.

Of the total respondents, 25.7%, 46.1% and 30.0 % did not agree that HEWs at health posts are skilled enough to detect and treat or to refer pregnancy related complications, to manage normal delivery, detect and treat or refer delivery complications respectively.

Around 90% of the respondents had felt that there is health facility around their proximity commonly health posts but many of them could not estimate the distance in Km or walking hours. Hundred twenty nine (27.2%) of the respondents said that the health facility in their surrounding do not provide delivery care while another 14.4% did not know whether the health facility provides delivery care.

Of the total respondents, around 14% have never used any modern health facility.

Forty respondents (56.3%) out of the 71 mothers, who gave birth in the health facility, got the service with payment and 27.5% said that the payment is expensive.

The over all health care service utilization of respondents was said to be decided by self (71.5%) and husband (25.7%) and the rest by others.

Reportedly, two hundred ninety eight (35.4%) of the total respondents did not get satisfaction with HEWs ANC, delivery and postnatal care service provision.

5.4 Bivariate and multivariate analysis

Bivariate analysis

Analysis of socio-demographic variables on binary logistic regression showed that maternal age, and marital status were significantly associated with ANC attendance at $p < 0.05$. On the other hand income, education, religion and occupation of the respondents did not show significant association with ANC attendance.

Analysis of obstetric variables such as age at first pregnancy, having history of obstetric complications, pregnancy wanted, and gravidity showed statistical associations with ANC attendance at $p < 0.05$. But experienced prenatal health problem was not significantly associated with ANC attendance.

Additionally, mothers' risk perception on pregnancy and childbirth were significantly associated with ANC attendance at $p < 0.05$. Decision making status of women on maternal health care service utilization has also showed significant association with utilization of prenatal care.

Regarding respondents' preferred place of delivery, socio-demographic variables like age, marital status, and educational status were not significantly associated with health facility delivery.

Crude analysis of obstetric variables on binary logistic regression showed that ever had HF delivery and received ANC were significantly associated with health facility delivery. On the other hand, experienced prenatal health problems were not significantly associated with health facility delivery.

More importantly, decision making for health service utilization, satisfaction with HEWs' ANC, delivery and PNC service provision role, and perceived childbirth risks were significantly associated with health facility delivery at $p < 0.05$.

Women's age is statistically significant at any category but women's whose age is between 24 and 35 years are around 3 times more likely to attend ANC OR=3.10, 95% CI=1.46-6.56. In this study unmarried women are also less likely to follow ANC than their counter parts OR=0.53, CI=0.34-0.82. Decision making for maternal health care services utilization as a determinant factor showed that women who can decide by themselves are more likely to attend ANC than their counter parts OR=2.93, 95% CI =2.17, 3.95.

Respondents who had had history of obstetric complications are more likely to attend ANC than those who never had encountered obstetric complications OR=1.48, CI=1.05-2.09. Respondents whose age were <18 years at their first pregnancy are less likely to attend ANC than those who conceived 18 years and above at their first pregnancy OR=0.70, CI=0.53-0.93. Mothers who wanted or planed their pregnancy are more likely to attend prenatal care than who did not plan or wanted to have pregnancy OR=1.57, CI=1.14-2.14. Further more, mothers who had less than four pregnancies are more likely to attend ANC than who had more than four pregnancies.

Women's perception on maternal health risks and towards HEWs maternal health service provision role has showed statistical significance. Women who perceived that a woman might experience additional health risks during pregnancy and child birth are more than two times more likely to attend ANC compared with those who do not have such perception OR= 2.63, CI=1.695-4.08.

Women who were able to decide by themselves for maternal health care utilization are two times more likely to attend HFs delivery OR=2.22, CI= 1.34, 3.67. Mothers who ever had HF delivery, received ANC, satisfied with HEWs' maternal health service provision role, and perceived childbirth risks are more likely to give birth in the HFs than their counter parts OR=7.40, CI=4.36, 12.53, OR= 4.37, CI=2.14, 8.92, OR= 2.91, CI=1.54, 5.49, OR= 4.56, CI=1.10, 18.92 respectively.

5.5.2 Multivariate analysis

Multivariate analysis to identify independent predictors of antenatal care and safe delivery service utilization was carried out. Consequently maternal age, marital status age at first pregnancy, decision maker for health service utilization, perceived pregnancy and childbirth risks as well as home delivery risks, showed significant association for ANC attendance even after controlling for confounding factors.

Mothers whose age is between 24 and 35 are more than two times likely to utilize ANC than those above this age group or below AOR =2.78, (1.25-6.20). Currently unmarried women and mothers whose age are less than 18 years at their first pregnancy are less likely to utilize ANC services than their counter parts AOR=0.52, CI=0.32, 0.84, AOR=0.70, CI=0.51, 0.95 respectively.

Respondents who perceived pregnancy and childbirth related risks are more likely to attend ANC AOR=1.94, CI=1.22, 3.09. Women's decision making ability for health service utilization also showed significant association for ANC attendance AOR=2.53, CI=1.86-3.45.

Antenatal care service utilization and ever delivered at HF prior to the last pregnancies are the two strong predictors of health facility delivery. Women who had antenatal care attendance were almost three times more likely to give birth in the health facility AOR= 2.86, CI=1.34, 6.11. More importantly, women who had given birth at health facility at least once in life time are almost six times likely to give birth in the health facility than who never gave birth in health facility AOR=5.89, CI=3.39, 10.26.

See table 7 and 8 for both bivariate and multivariate analysis for ANC attendance and HF delivery respectively.

Table 7: Selected socio demographic, obstetric and other determinants of ANC service utilization, Gubalafto Woreda, North Wollo zone, ANRS, Ethiopia, March 2009.

Utilization, Gabarale Woreda, North Wollo Zone, Amhara, Ethiopia, March 2009.				
Variables	ANC attendance		Crude OR 95%CI *	Adjusted OR 95%CI **
	Yes (n=533)	No (n=308)		
Age at interview(yrs)				
< 20	12	13	0.64(0.28, 1.45)	0.69(0.28, 1.70)
20-34	353	178	1.38(1.03, 1.85) *	1.24(0.87, 1.77)
> 35	168	117	1.00	1.00
Marital status				
Currently Un married	42	43	0.53(0.34,0.82) *	0.52(0.32, 0.84) *
Currently married	491	265	1.00	1.00
Educational status				
Illiterate	500	291	0.89(0.84, 1.61)	
Literate	33	17	1.00	
Decision maker for health service utilization				
Self	292	90	2.93(2.17, 3.95)*	2.53(1.86, 3.45)*
Other than self	241	218	1.00	1.00
Having history of obstetric complications				
Yes	91	72	1.48(1.05, 2.09)*	1.21(0.83, 1.76)
No	442	236	1.00	1.00
Perceived pregnancy and childbirth risks				
Yes	413	130	2.63(1.69, 4.08)*	1.94(1.22, 3.09)*
No	120	178	1.00	1.00
Age at first pregnancy				
<18years	281	189	0.70(0.53,0.93)*	0.70(0.51, 0.95) *
>=18 years	252	119	1.00	1.00
Pregnancy wanted				
Yes	412	211	1.57(1.14,2.14)*	1.29(0.92, 1.81)
No	121	97	1.00	1.00
Gravidity				
<4 pregnancy	289	137	1.49(1.12,1.96)*	1.15(0.81, 1.64)
4 and above	244	171	1.00	1.00
Experienced prenatal health Problems				
Yes	176	102	0.99(0.74,1.34)	
No	357	206	1.00	

* Statistically significant at p<0.05 ** Adjusted for socio-demographic & other variables.

1.00= Reference categories

Table 8: Determinants of preference place of delivery by respondents for different factors, Gubalafto District, North Wollo Zone, ANRS, Ethiopia, March 2009 (n=841)

Variables	Preference of delivery place		Crude OR 95% CI *	Adjusted OR 95% CI **
	HF (n=71)	Home (n=770)		
Age				
15-24	15	136	1.60(0.35, 7.37)	1.09(0.21, 5.82)
25-34	34	171	1.33(0.30, 5.80)	0.94(0.19, 4.67)
35-44	20	234	1.24(0.27, 5.57)	0.84(0.16, 4.25)
44+	2	29	1.00	1.00
Marital status				
Un married	5	80	0.65(.26, 1.67)	0.85(0.32, 2.31)
Married	66	690	1.00	1.00
Educational status				
Illiterate	64	727	0.54(0.234, 1.25)	0.80(0.29, 2.16)
Literate	7	43	1.00	1.00
Decision maker for health service utilization				
Self	45	337	2.22(1.34, 3.67)*	1.22(0.68, 2.16)
Other than self	26	433	1.00	1.00
Satisfaction with HEWs' ANC & delivery service				
Yes	59	484	2.91(1.54, 5.49)*	1.56(0.76, 3.19)
No	12	286	1.00	1.00
Received ANC				
Yes	62	471	4.37(2.14, 8.92)*	2.86(1.34, 6.11)*
No	9	299	1.00	1.00
Ever delivered in the HFs				
Yes	31	73	7.40(4.36, 12.53)*	5.89(3.39, 10.26)*
No	40	697	1.00	1.00
Experienced prenatal health problem				
Yes	25	253	1.11(0.67, 1.84)	1.30(0.74, 2.27)
No	46	517	1.00	1.00
Perceived pregnancy and childbirth risks				
Yes	69	680	4.56(1.10, 18.92)*	2.79(0.64, 12.32)
No	2	90	1.00	1.00

* Statistically significant at p<0.05 ** Adjusted for socio-demographic & other variables
1.00= Reference categories

II. Qualitative Findings

A. Key informant in-depth interviews

A total of 10 health extension workers from 6 Kebeles were interviewed about the main maternal health care services provided for the mothers, main health problems for referral (if any), some of the danger signs that occur during pregnancy and childbirth, some of the health related MDGs, common traditional practices done by the mothers or community and efforts to avert such harmful traditional practices.

As shown from the health posts' document from where HEWs were interviewed, a total of 488 and 278 mothers visited the health posts for ANC and PNC services respectively for the last six months (Aug. 2008- Jan. 2009) prior to the interview. Regarding the delivery services given for the mothers, around 180 mothers had been reported as if they got delivery service from the health posts but only 7/180 of deliveries were conducted by the HEWs in the health posts and expectants home. But the rest mothers who were considered and reported as they have been delivered in the HFs were actually delivered in their home mostly by TBAs. Such report usually came from TBAs to the health posts and in turn the health posts compile the report monthly and sent to the nearest health center.

Most health extension workers mentioned that family planning, immunization, antenatal care and health education are the main maternal health care services rendered by them. Since maternal health problem during pregnancy, childbirth and after delivery are prevalent and educational preparation of HEWs are of the lower level, referral to the next higher level HF is expected and due to this HEWs were asked about referral made during the last six months. But only 7 mothers from three health posts were referred. Most HEWs who referred mothers mentioned that pregnancy related problems like malpresentation and hypertension were the main maternal health problems for referral. Further more, most informants who did not refer mothers agreed that self referral (mothers directly went to higher level HF with out having referral paper), especially, with serious cases was the main reason for not referring mothers during this period.

Most HEWs at health posts were not attending normal delivery. During the interview, again 7 mothers from four health posts and expectants home were delivered by HEWs and in some cases were conducted together with community health agents. More importantly, almost all informants had identified that inadequate knowledge and skills gained during in school training, absence of additional in service training and refresher course, lack of materials and mothers preference to be attended by TBAs as the main reasons for not conducting labor. They further described the training was inadequate, especially, the practical sessions were not enough to acquaint them with the necessary skills. Due to this, reportedly, HEWs did not dare to conduct labor with limited knowledge and skills and mothers did not come to health posts for delivery purposes. Also contradictory standards of practices between the HEW and TBA were not uncommon.

An informant said;

“Through out my service years, I conducted only one labor at home together with TBA and my friend. After we assisted the mother what we can, the mother started to bleed and we were with out ergometrine and we tried to elevate the feet of the mother but the TBA resisted this idea. The health post was around half Km away from the expectants home and we took only gloves, forceps and syringe (to extract mucous from the new born). Finally, after we had ensured that the mother and her baby are well enough; we felt as if we ourselves gave birth to the baby since it was our first time to conduct labor and we became happy on what had happened. Afterwards the community understood that HEWs can conduct labor but there was no full delivery kit including ergometrine and delivery coach until we were supplied by UNICEF three months before (preceding the in-depth interview).”

This shows how they are concerned about the delivery service they to provide and partly there appeared to be some signs of frustrations.

One informant puts it as follows:

“During the training there was no practical session on actual expectant mothers and never seen a mother with labor during apprenticeship. Last year in March, I tried to assist a mother with labor at home. TBA was there to assist the mother like me. Even though the environment was not conducive, we helped her as much as we can. We were

worried about the survival of the mother and her new born. So I promised to st. Abune-Gebremenfeskidus (Abo church) to provide one pack of candle if the mother and her baby survived. On the next day I heard that both of them were in good condition; and I am going to give what I promised to Abo church in the coming March. Even at this time I can not conduct labor alone. It is torturing to sit and see a mother taken to a health center with locally made stretcher. We are highly interested to conduct labor but we are afraid to do so because we do have nothing to assist just in case with a labor gets complicated and a mother bleeds and die. So we should get training and practice. As we are here, we should give complete services and this is the main way to get community acceptance.’’

The majority of HEWs knew some of the main danger signs that occur during pregnancy and childbirth as well as after delivery even though they often mixed and mentioned non danger signs. Among the commonly mentioned danger signs:- pregnancy related; diminished fetal movement for 24 hours, bleeding, fever, headache, unconsciousness, abdominal crump, edema and height <150 cm. During labor; bleeding, retained placenta, fistula and fever. After delivery, bleeding and headache were included.

Unfortunately most of the informants were unable to list some of the main health related MDGs and more specifically, MDG₅ to reduce maternal mortality by 3/4th. Similarly, the majority of them mentioned immunization, FP, and health education as the main interventions to be done to achieve MDGs but almost all did not mentioned safe delivery service/ skilled attendance at delivery.

Regarding integration and coordination to run activities in the community, reportedly the majority of them have been making coordination with community promoters (those trained by ESHE), community health agents (TBAs and CHAs), kebele administrators, education and agriculture sectors and carry out activities with out any conflict.

Like that of the FGD findings, the common traditional practices done in the community as reported by most of the informants include; abdominal massage, turning the mother on labor upside down, preferring non trained attendants, giving butter to the new born, etc.

B. Focus group discussion summary results

A total of 56 community leaders in eight Kebeles were involved in eight groups to discuss about maternal health care practices in their community. Community leaders got involved in this study because they are more aware of the community including maternal health care practices. FGD with community leaders was carried out to identify the common health problems and its solutions, HEWs role on maternal health service provision, common traditional practices during pregnancy and childbirth, pregnancy and delivery related danger signs.

Majority of the group discussants were able to name some of the common maternal health problems in their area, such as abortion, delay in labor (prolonged labor), diseases related to shortage of nutrition, failure to attend maternal health care services including safe delivery service utilization etc. On the other hand, most of the participants' wife and mothers in their community had went to traditional birth attendants when they encountered maternal health problems especially labor related problems. The majority of them new the presence of maternal health services like FP, immunization and health education in the nearby health facility. Yet, most of them failed to mention ANC, delivery, and PNC as maternal health care services given in their proximate HF. As stated by many of the discussants, the preference of mothers to traditional medicine was associated with the inheritance of such practices from ancestors.

Some of the reasons given by the majority of discussants for low utilization of services, especially, delivery and PNC services in their community are distance, less awareness about maternal health care services given and risks associated with pregnancy and delivery, focusing on traditional practices, lack of materials in the HFs, and inability of HEWs to conduct labor.

One of the discussants said

“No adequate maternal health care service is given in the nearby health post and the health center is far for the community to give delivery service for the mothers. Few years before, my wife was in labor and got difficulty to safely deliver her baby. Unfortunately, we were in Woreda town where my wife families reside. Later, we took her to HC as we were very near

to the HC and got assisted by HWs and the mother survived with her new born. For the second delivery, after was told that her pregnancy is normal, the placenta was retained and the same had happened. Imagine what will happen if we were here and did not take her to health facility.’’

More than half of the participants explained their satisfaction with HEWs health service provision role especially on FP, vaccination and H/E. But they also expressed their dissatisfaction on delivery services (the community perceives as HEWs can not conduct delivery) and lack of delivery materials especially in the health posts.

Almost half of the discussants described massaging the abdomen during delivery, turning the mother upside down when labor delays, giving traditional medicine, introducing herbs into the birth canal to stop bleeding, shaking the mother to remove placenta, cutting the umbilical cord with unclean materials, tapping the feet of expectant mother when placenta delays, and giving butter for new born baby to be some of the common traditional practices done during pregnancy and childbirth in their community. The majority of the participants said most of the time decision is made by husbands. The husband is the decisive person for the mothers to get maternal health care including ANC and delivery services.

For the question ‘was a mother able to go to higher level HF with out delay after referral due to some problems encountered during pregnancy and childbirth’ majority of discussants who are nearer to the main road said possible with some limitation like costs, but those distant from the main road said impossible due to lack of transport and high cost; and the survival of the mother with the problem and her conception or new born depends on the service given by the nearby HF.

Delay in labor and vaginal bleeding are the most frequently mentioned danger signs by most of the participants. Around half of the participants agreed that lack of the necessary treatment materials and absence of health workers during appointment (for instance for FP services, leads to unwanted pregnancy) as weakness of the health institution. On the other hand, more than half of them said the daily and house to house contact of HEWs with the community as the strong side.

Finally, majority of the participants described that continuous health education to increase awareness and prevent traditional practices, discussion with health workers, enhancing modern health care service utilization, and participatory discussion between mothers are some of the main solutions to improve maternal health care service in the community.

6. Discussion

This community-based study has tried to assess women's practices during pregnancy and childbirth particularly ANC and delivery service utilization. Additionally, the study has attempted to identify more prevalent traditional practices experienced during pregnancy and childbirth together with HEWs' role in the provision of maternal health care in the study area.

Maternal age is shown to be significantly associated with maternal health care utilization (14,15,16). Consistent with other studies, women younger than 35 years are more likely to attend ANC. The possible explanation could be; younger women may be more likely to accept modern health care services since; they are more likely to attend formal education. Older women on the other hand, tend to believe modern health care is not as necessary as the traditional one due to experience, confidence and knowledge from previous pregnancies and childbirths thus giving less attention to ANC follow up. In addition women in the older age group are more likely to have more children to care for. The 2005 EDHS also indicated that mothers younger than 35 years are more likely to utilize prenatal care than the older mothers (9).

In this study, respondents' marital status is also found to have significant association with prenatal care visit. There is increased maternal health service utilization among married women. Similar with other studies, currently married women are more likely to utilize ANC services than unmarried. The possible reason might be currently unmarried pregnant woman may not be courageous enough to visit ANC clinics due to fear and poor attitude towards her current pregnancy. As a result women may become less motivated to seek ANC compared with their married counterparts (8,17,29).

Even though many previous studies had witnessed that women education is an important predictor of maternal health care utilization by increasing awareness and decision making ability of the women (15, 17,29,30), in this study education is not significantly associated with prenatal care utilization. The possible explanation for this might be the study is done

in the rural community where most of the respondents' ethnicity, education level and occupation etc are homogenously similar.

Mothers who had perceived pregnancy and childbirth risks were significantly associated with ANC attendance. Such finding was also shown in a study carried out in Jimma town, since pregnant women who did not use ANC services were those who consider that ANC service has no effect in reducing death and illness in the mother and baby (27) and in rural Kano, Nigeria as women's perception of their condition was identified as one of the major barrier for antenatal and Obstetric care service utilization (20). This implies perceptiveness of pregnancy and childbirth related risks by the mother have to be increased through continuous health education commonly by HEWs in order to increase maternal health service utilization.

In this study, mothers who were under 18 years at first pregnancy were less likely to attend ANC than their counter parts. The reason might be due to fear of exposure to the public and less confidence and interest on the current pregnancy. But several studies done so far, showed maternal age at first pregnancy revealed positive association with ANC attendance (17, 18).

Antenatal care utilization of mothers was also influenced by whether or not the pregnancy was wanted/planned. There was a higher tendency of ANC attendance among those mothers whose pregnancy were planned or wanted. The results of the present study are found to be similar with another community based study in Yirgalem and Jimma where women who want their pregnancy were found to have used prenatal care compared with women who did not want their pregnancy (29, 30).

The number of pregnancy a woman experienced was found affecting the mother's utilization of ANC. The utilization of ANC services were significantly more likely among women with lower gravidity than higher gravidity. Lower utilization of maternal care services among higher gravidity women could be due to time and resource

constraints faced by those with large families, and greater experience of higher parity women with pregnancy and childbirth was also supported by another studies (17, 29).

Similar with a study done in Southern Tanzania to assess use pattern of maternal health services and determinants of skilled care during delivery, Women who reported that they had health problems during pregnancy did not have an increased chance to use skilled attendants for delivery compared to those who had no health problems during pregnancy (16), but unlike this study another study that had assessed utilization of care during pregnancy in rural Guatemala showed that women who had experienced serious complications being about twice as likely to seek care than their counter parts (21).

Having past history of obstetric complications was found to have statistical significance with ANC use both in this study and another similar studies done in Ethiopia and other places (4,17,18,19). The reason for this might be, mothers with previous obstetric complications may fear some thing the same may happen and need advice and support from health personnel.

Concerning women's decision-making power, in the current study, women who could decide by themselves for maternal health care service utilization were two and half times more likely to attend ANC than those who expects decision from other bodies. Similar with this study, the finding of another community based study showed that 80% of the women who reported that their husband approved of prenatal care actually used prenatal care services compared to only 40% of the women who reported their husband did not approve of prenatal care (30). In the current study, husband influenced for 4.9% of the mothers for ANC attendance in particular and for 25.7% of mothers for health service utilization in general.

The purpose of ANC is to prepare the mother for child birth and in order to promote a favorable outcome for the mother and a child (23). So increasing ANC attendance by the mothers is very important and the current survey coverage in general can be said good. But, this ANC survey coverage is lower than compared with 99.8%, and 90% ANC

attendance in Tanzania and Kenya respectively (3,16). However this finding (63.4% ANC coverage) is higher than some other community based study done in Southern and North West Ethiopia (4, 28) and not consistent with EDHS 2005 report where 28% of mothers received antenatal care from health professionals and less than 1% of mothers received antenatal care from a traditional birth attendant (trained or untrained). The reasons for this higher coverage may be due to accessibility of health posts and unlike delivery service, HEWs' good involvement in prenatal care service provision and good perception of the community towards such service as also indicated during FGD. Additionally, EDHS is a nation wide survey. However, this figure is very close to the ANC progress seen in Sub-Saharan Africa in which more than two thirds of women received antenatal care at least one time during pregnancy (24).

ANC is more effective in preventing adverse pregnancy outcomes when it is sought early in pregnancy and is continued throughout pregnancy as recommended by WHO (26). But, in the current study, of the total 533(63.4%) respondents who had attended antenatal care during last pregnancy, only 8(1.5%) started ANC during the first trimester, 125 (23.5%) and the majority, 399 (74.9%) attended ANC during the second and third trimester respectively which is very late compared with WHO's relatively newly recommended focused ANC (26).

Almost similar with present study, another community based study showed that around 26% started prenatal care within the second trimester (29). On the other hand, a study done in a rural training health centre in North West Ethiopia showed 53.8% of pregnant women begin attending ANC in the second trimester of pregnancy and 45.9% begin ANC in the third trimester. Only a single mother began attendance in her first trimester (28). The discrepancy between the proportion of women attending during the second trimester in the present study and a study in a rural training health center might be that the later study might have also included urban respondents who may have good awareness to attend ANC relatively earlier than their counter parts.

In the current study, 12.9% and 63.6% of mothers received ANC only one and two to three times respectively. However, majority of the respondents did not make the minimal number of visits (four) as recommended by the WHO (26). But in another study, 38.5% mothers visited the clinic only once and 42% two to three times (28). The possible reasons for less number of only one visit and higher number of two to three times in this study may be due to a relatively increased awareness of mothers and accessibility of health facilities as there is longer period between the two studies.

This study has also assessed reasons for non attendance of ANC service in the study area. The finding of this study showed; no problem faced during prior pregnancy (30.8%), lack of money (24.7%), health facility too far (23.3%), I do not know where to go (15.6%), transportation problem (13%), lack of confidence on the providers (12.7%), as well as lack of time and no childcare support at home were among the main reasons given by the respondents for not attending antenatal care during the last pregnancy. Some of this findings are almost similar with other studies which identified; distance from health facilities, cost (such as direct service fees as well as the fees associated with drugs, supplies and transportation,), multiple demands on a woman's time and women's lack of decision-making power within the family as factors preventing women in developing countries from seeking life-saving healthcare services they need (13,16,17). The findings of FGDs were also in line with the quantitative findings.

Increasing the proportion of deliveries with skilled attendance is widely regarded as key in reducing maternal mortality and morbidity in developing countries (33). The findings of this study had revealed that only 71 (8.4%) mothers gave birth in the health facility. The HFs delivery identified in this study is much less than even compared with the delivery coverage indicated in Eastern Africa countries like in Kenya and Tanzania where around 20% and 46.7% of deliveries took place in the HFs respectively (3,16). It is also less than from other community based study done in North Gonder Zone where 13.5% of respondents gave birth in the HFs (37) and the report of Ministry of health Ethiopia 2006, where deliveries attended by skilled health personal is 16.4% (34). This high difference in coverage in HF delivery may be due to different socio-demographic and economic

contexts of the different nations and with in the nation also it may as well be due to involvement of urban respondents in case of community based study done in North Gonder Zone (37).

But this finding is not markedly differing with EDHS 2005 report in which only 6% of the births were delivered in the HF. The likely explanation for this slight difference may be due to the accessibility of health posts and EDHS report probably may not incorporated health post delivery as a HF delivery assisted by skilled attendants and it is a nation wide survey. Unlike to the qualitative study, the findings from quantitative study showed mothers who had delivered in the health posts and assisted by HEWs were high. In case of the in-depth interview; of the total 10 HEWs interviewed, only three of them said we conducted labour, giving a total of only 7 mothers (3.9%) but in the quantitative study it was indicated that 33 (45.5%) mothers were assisted by them. It is not also similar with the report of Ministry of health Ethiopia 2006 (34), where deliveries attended by HEWs was 7.3% even though it is not specified whether it is included in skilled attendance. This great discrepancy might possibly be due to inability to interview those HEWs engaged in conducting labour in remote areas where expectant mothers have no choice to seek other qualified health professionals/ higher level HF and the report of MOH is a nation wide and variability may be expected.

Almost similar with a community based study in North Gonder Zone where 76.4% of mothers were assisted by TBAs and relatives (37), in this study 73.3% of the home deliveries were assisted by TBAs (33.8%) and relatives. But in case of EDHS 2005 report, TBAs and relatives assisted 28% and 61% of mothers in labor respectively (9). The reason for high number of mothers attended by TBAs in this study might be, as said TBAs are trusted, highly accessible and affordable service provider members of the community (19). This explanation is congruent with one of the reasons given by the mothers for not giving birth in the HF. That is, 130 (16.9%) of the respondents mentioned presence of TBAs/ trust on TBAs as one of the reasons for non attendance of HF delivery.

Consistent with other studies, women who had ever given birth in the health facility before are almost six times more likely to utilize delivery services at HFs. This strong significant association could partly be explained due to increased in mothers' confidence and trust on providers from previous use of the service (18,19)

In the present study, previous ANC utilization was another predictor of maternal HF delivery care utilization. Women who received prenatal care were more likely to utilize health facility delivery than those who do not have the visits. This finding is similar with other studies done so far in Ethiopia and other countries (18,19,37).

This study also tried to identify about arrangements made during pregnancy by the mothers and the result showed that 27.5% of respondents / their family members had made arrangement prior to the last childbirth commonly by preparing essential items for clean delivery, saving money and identifying place of delivery. But a study conducted to assess birth preparedness and complication readiness among women in Adigrat town, taking into account place of delivery identification, means of transportation and saving money, about 22% of the respondents were prepared for birth and its complication (36). The slight difference on preparation made for birth seen between the two studies populations might be respondents in the current study may consider any preparation made before delivery and getting confined to bed as birth preparation, as well different population characteristics of the two study groups.

The major reported reasons for not using institutional delivery were; previous home delivery was normal/ absence of health problems 196(25.5%), told pregnancy was normal 191(24.8), presence of TBAs / trust on traditional birth attendance 130 (16.9%), facility too far 117 (15.2%), and respondents did not think necessary 113 (14.7). Most of these reasons were also identified by FGD discussants and almost consistent in another community based study (37).

Traditional practices related to labor and childbirth which are harmful were identified by this study. Practices like drastic measure to hasten labor by trying to remove forcefully

the presenting part and placenta, abdominal massage and shaking in prolonged labor and retained placenta were experienced by 162 (19.3%), 189 (22.5%) and 98 (11.7%) of the total 841 mothers involved in the study respectively. But this finding is much lower than the national figure for drastic measure to hasten placenta (70.6%), massaging of the abdomen of pregnant women (73.35%), shaking in prolonged labor (41.4%) (38). A related important finding in this study was substantial number of respondents 269 (34.7%) did not tie the cord. Additionally, 159 (20.5%) of the respondents applied materials to the umbilical cord of the new born, commonly butter. Almost half of the respondents (50.8%) gave butter and other liquids to the new born baby. Another community based study also showed similar traditional harmful practices experienced related to labor and child birth. Of the indicated practices, 12.1% left the cord untied. About 66.2% of rural respondents applied butter on the umbilical stump. Only 50 (12.2%) urban women and 324 (39%) rural women practiced abdominal massage during labor (37). Even though such traditional practices are still prevalent in the study area, the possible reason for the lower proportion in abdominal massage, and the material applied in this study may be due to the continuous health education given by HEWs to the community. But the higher figure for the cord being left untied in the current study could probably be described; such practice is inherited and deep rooted in the community without getting attention and often its outcome may not be immediately visible to the mothers.

Another important finding in this study is that the association between client satisfactions with providers service provision as well as perceived health risks and maternal health care utilization. Mothers who were satisfied with HEWs ANC and delivery service provision are around 3 times likely to give birth in the HF compared with those who do not have satisfaction. Moreover, mothers who perceived childbirth associated risks are also more than 4 times likely to give birth in the HF than who do not perceive such risks. When these are seen separately, all women were not satisfied in all maternal health care provision roles of HEWs as shown in both quantitative (35.4% respondents) and qualitative studies. Respondents and discussants dissatisfaction were particularly linked with HEWs inability to conduct labor due to some factors mentioned in the in-depth

interview as well as due to lack of necessary materials especially in the health posts. During in-depth interview, majority of the HEWs themselves also described as they can not attend normal labor.

The few studies/reports which were done previously related to health extensions activities outlined that: HEWs delivery skill to conduct normal labor were not developed, few time was spent for family health service and no delivery service by HEWs was reported in the study woredas, training inadequacy, were also consistent with the current study (39,40,41).

In line with this, cost/lack of money and distance were mentioned as barriers for not attending ANC and HF delivery by both respondents and discussants. Similar with other study findings, this may be due to associated costs like for transport, drugs, etc. (13,16) and most had mentioned distance as barrier which may be due to inaccessibility of high level HFs like HC, especially to get delivery and curative services irrespective of the presence of health posts in their proximity. The above discussed facts may raise the issue of quality which may influence the health seeking behavior. Quality may be compromised by being a HF is understaffed and under equipped like that of Guatemalan highlands and in other areas; in which accessibility of HFs alone does not bring health service utilization (17,21).

6. Strengths and Limitations of the study

6.1.1 Strengths

- The study is comprehensive in its type; that addressed prenatal, delivery and immediate postnatal health care practices of women and HEWs' role in the provision of maternal health care at a time.
- Qualitative study supplemented the finding of quantitative study.
- Relatively remote rural Kebeles of the Woreda were included in the study that might not be included in such survey before
- Data collectors were recruited from their respective Kebeles and knew all the localities of the kebeles; so that they able to accessed the study subjects including those in hard to reach areas.

6.1.2 Limitations

- Recall bias could not be rule out since the study assessed women's last pregnancy and childbirth related practices with in one year.
- Separate sample size for currently pregnant and lactating mother (with <1yr children) were not carried out since the purpose of the study is to collect information from both pregnant and lactating mothers by providing the same questions related to last pregnancy and childbirth.
- Women from small urban areas were not included in the sampled population, if were included in the study, might have been helpful for comparison purpose.
- Subjective nature of seriousness and severity ascertainment for presumed complication encounters during pregnancy and childbirth.
- Since the study is cross sectional, temporal relationship could not be established.

7. Conclusion

- Antenatal care attendance in the study area is high compared with delivery service utilization but the time they started and the number of visits were below the minimum standard recommended.
- The main reasons mentioned for ANC non attendance and for not giving birth in the HF were associated with maternal low awareness of the need of care and socio-economic factors.
- Mothers' health seeking behavior was minimal since majority of those who encountered problem during pregnancy, delivery and post delivery did not get medical assistance.
- A huge gap between ANC utilization and HF delivery was identified since out of the total 63.4% mothers who attended ANC only 8.4% delivered in the HF.
- Decision making status of a woman for health service utilization as well as perceived pregnancy and childbirth risks as the main predictors of ANC attendance may be helpful in improving maternal health care.
- Previous use of antenatal care and ever delivery in the HF were found to be strong predictor of safe delivery service utilization.
- Leaving the new born umbilical cord untied, applying material to the cord and giving butter for the new born were among the prevalent post partum traditional practices in the study area.
- Traditional practices which are more harmful to the health of mothers and the newborns like drastic measures, abdominal massage, shaking, that are exercised during childbirth were identified to be prevalent in the study area.
- Health extension workers role in ANC service provision was good but very minimal in case of conducting normal delivery.
- Substantial number of respondents and discussants expressed their dissatisfaction with less involvement of HEWs in delivery services. Further more, most HEWs themselves reported as they did not ever had conducted labor due to gap in knowledge and skill they have as a result of inadequate training they got.

8. Recommendation

- ❖ Since antenatal care is an important entry point for many maternal health care services, it should be strengthened so that mothers should begin ANC attendance starting from the first trimester and made at least four visits.
- ❖ Appropriate health education/BCC should be given to the community and women in particular to increase utilization of maternal health care services and to increase awareness/perception on danger signs that are seen during pregnancy and childbirth, and promote health seeking behaviors.
- ❖ A gap between ANC and delivery service utilization will be minimized if at least those women who visited the HF for ANC should get appropriate advice and support by the health workers and their high trust on TBAs for delivery care should be shifted primarily to HEWs who are working at the grass root level as the core aim of providing ANC is to promote skilled attendance at birth /clean delivery.
- ❖ Harmful traditional practices that are commonly practiced during pregnancy and childbirth should be minimized by involving different concerned bodies. First the HWs in that community should get aware on such problems and take it an important agenda and discussed with the community leaders, community health agents and religious leader. Finally based on the consensus reached, sustainable education should be given to the community and to the mothers.
- ❖ Adequate in-service training for HEWs is mandatory to increase their midwifery skills so that they will able to conduct normal deliveries and will get community acceptance in this regard.
- ❖ Health facilities especially health posts should be well staffed and equipped with necessary trained human power and materials since ensuring accessibility of HFs alone does not bring health service utilization.
- ❖ Decision making status of the women should be improved through gender education and community support to improve maternal health care utilization.
- ❖ NGOs and other stake holders should also be involved to promote maternal health care and avert related harmful traditional practices in the study area.

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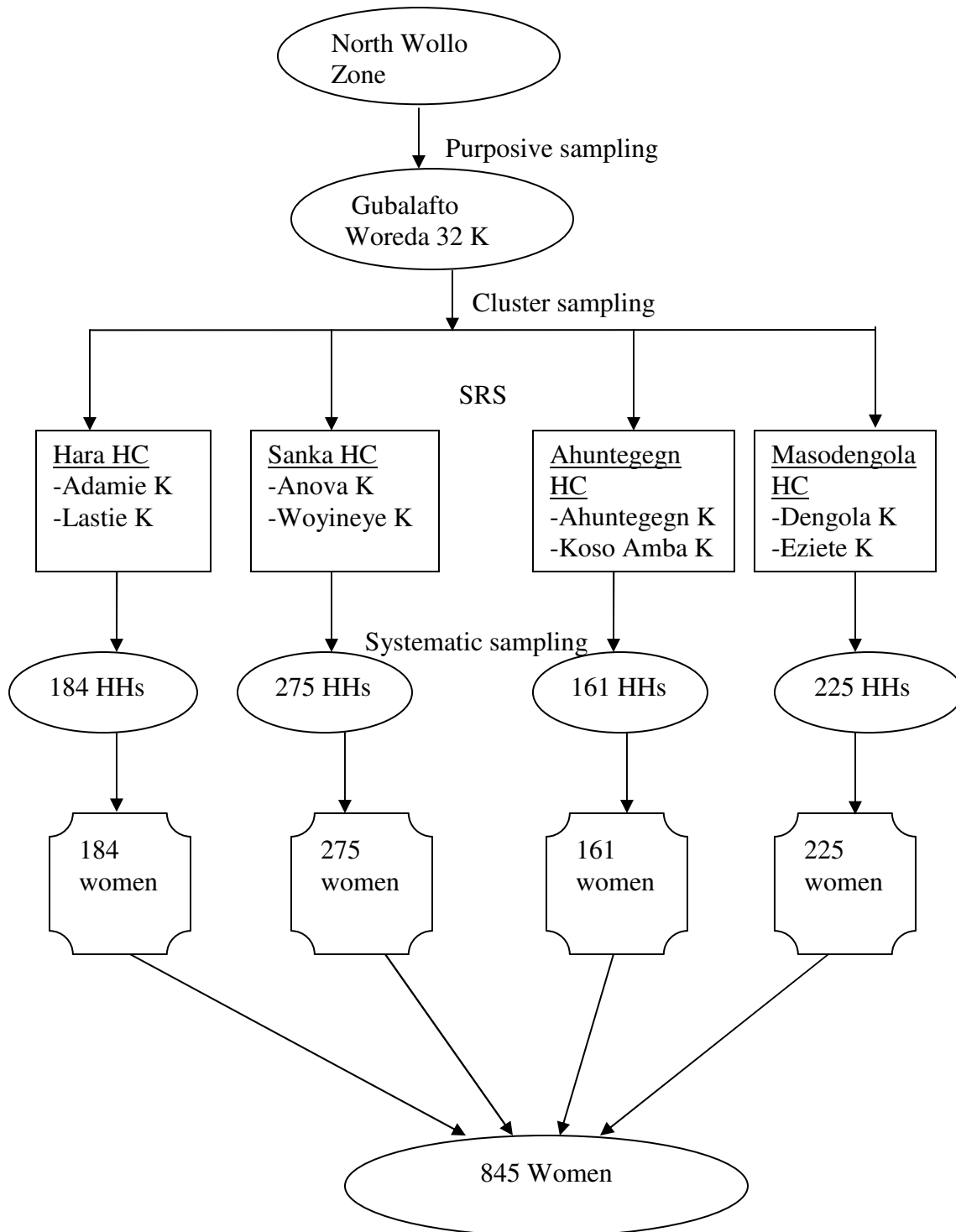
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Annex 1: Schematic presentation of sampling procedure



HC=Health center

K=Kebele

SRS=Simple random sampling

Annex 2. English Version of Structured Questionnaire

School of public health, Faculty of Medicine, Addis Ababa University

A structured Questionnaire for interview of women to assess their practices during pregnancy and childbirth

Verbal Consent Form

Good morning/afternoon. My name is -----I am working temporarily as a data collector with the school of public health of AAU, which is conducting a study among pregnant and lactating women. The objective of the present study is to assess practices of women during pregnancy and childbirth. During the interview you will be asked some short questions about your background, about practices, your perceptions, etc. Your answers will be recorded on a survey questionnaire. You may feel uncomfortable or experience some emotional stress from being asked some of the personal questions. No personal identifiers will be attached/ recorded to the interview. All the data obtained will be kept strictly confidential by using only code numbers and will be stored in locked file cabinets to be accessed only by the principal investigator (destroyed immediately when the study is finalized). Your participation in the study is upon purely voluntary basis. What we learn from this study will be used to generate information necessary for the planning to improve maternal and child health. The interview will be conducted in private and will take 30-45 minutes. During the interview (discussion) period, if you feel inconvenient, you can interrupt and clarify inconvenience, appoint to other time or even withdraw any time after you get involved in the study. Your honest and genuine participation in responding to the questions prepared is very important & highly appreciated. If you agree to participate in this study I will interview you.

Would you be willing to participate?

If yes, proceed. If no, thank and stop here.

Name and signature of interviewer certifying that respondent has given informed consent
Name_____ Signature_____

Identification information

001. Code No-----

002. Kebele-----003Sub-kebele-----004House No. -----

Part I: Background characteristics of the women

Q.#	Questions	Coding categories	Go to Q.# or section__
101	How old are you?	Age in complete years----- Don't know-----98	
102	To which ethnic group do you belong?	Amaha-----01 Tigræ-----02 -Others (Specify) _____97	
103	What is your religion?	Orthodox-----01 Muslim -----02 Protestant -----03 Other (Specify)_____97	
104	Marital status	Never married -----01 Currently married-----02 Separated -----03 Widowed -----04 Divorced-----05 Other (Specify) _____97	
105	Age at first marriage	Numbers in complete years_____	
106	Family size	Less than 3-----01 3-5-----02 6 or above-----03	
107	What is the level of formal education you completed?	Illiterate-----01 Literacy (read & write)-----02 Primary -----03 Secondary-----04 Tertiary (above 12) -----05 Other (Specify)_____97	
108	What is your occupation?	Gov. employed-----01 Housemaid-----02 Student -----03 Farmer -----04 Merchant-----05 Others(specify)_____97	
109	Your income per month	<150 birr -----01 151-650 birr-----02 651-1400 birr -----03 1401 birr & above-----04 Unable to estimate_____97	

Section 2: Gravidity and parity

Q.#	Questions	Coding Categories	Go to Q.# or section__
201	How many times in total you became pregnant?	Two-----01 Three-----02 Four-----03 Five-----04 6 and above-----05	
202	How old were you at your 1 st pregnancy?	Age in completed years_____	
203	Are you currently pregnant or lactating	Pregnant-----01 Lactating-----02	
204	Was the last pregnancy planned /wanted?	Yes -----01 No-----02	
205	How many of your pregnancies resulted in a baby that was born alive?	Zero-----01 One-----02 Two-----03 Three-----04 Four-----05 5 and above-----06	
206	How many of your pregnancies resulted in a baby that was born dead?	Zero-----01 One-----02 Two-----03 Three-----04 Four and above-----05	
207	How many of your pregnancies resulted in abortion?	Zero-----01 One-----02 Two-----03 Three-----04 Four and above-----05	
208	What was the out come of the last pregnancy?	Live birth-----01 Still birth-----02 Abortion-----03	

Section 3: Practices related to Current/last pregnancy

Q.#	Questions	Codes	Skip
301	Did you have antenatal care during your last pregnancy?	Yes -----01 No -----02	If no ➔ 307
302	How many months pregnant were you when you first received antenatal care during your last pregnancy?	1-3Months -----01 4-6 months-----02 7-9 months-----03 Don't know/Don't remember-----98	
303	Where specifically were you attending ANC during you last pregnancy?	Hospital-----01 Health center-----02 Health post-----03 Other (specify) 99	
304	How many times in total did you receive antenatal care during last pregnancy?	Only once-----01 2-3-----02 4-----03 5 & above-----04 Don't know/Don't remember-----98	
305	Whom did you first see for a checkup on last pregnancy?	Doctor -----01 Health officer-----02 Nurse/Midwife03 TTBA04 TBA05 HEWs.....06 Other 97 (specify) Don't know/Don't remember..98	
306	During your ANC follow up, did a health worker advise you about any of the following at least once? Read each(multiple answers possible)	Danger signs of serious health problems during pregnancy, childbirth, or soon after-----01 Where to go if you encountered signs of serious health problems? -----02 Where you should give birth to your baby?---03 Arrangements for transportation -----04 Arrangements for a healthcare professional to deliver your child-----05 VCT during pregnancy-----06 TT immunization-----07 The need of nutrition-----08 Other 97 (specify) Do not remember -----98	
307	If did not receive antenatal care, what were the reasons for not attending antenatal care for your last pregnancy?	Do not know where to go.-----01 Health facility too far-----02 Lack of money.....03 No one was there to accompany04	

	Read each (multiple answers possible)	No good service.....05 Lack of confidence on the Providers' capacity-----06 Transportation problem-----07 Long waiting time-----08 Unhappiness from the previous service delivery-----09 Lack of time-----10 No problem faced during Prior pregnancy-----11 Husband did not allow-----12 Low belief about effectiveness of ANC-----13 No childcare support at home -----14 Other _____97 (Specify) Don't know-----98	
308	During this very last pregnancy, did you experience any serious health problems related to the pregnancy?	Yes01 No02 Don't know.....98	If no → Sect.4
309	If yes, what problems did you experience? (Probe: ask for the problems which are not mentioned spontaneously). Circle all the problems mentioned.	Vaginal bleeding.....01 Severe headache02 Blurred vision 03 Convulsion.....04 Swollen hands/face05 High fever06 Loss of consciousness-----07 Difficulty of breathing ---.....08 Severe weakness09 Severe abdominal pain-----10 Accelerated/reduced fetal movement11 Water breaks without labor -----12 Other _____97 (Specify) Don't Know -----98	

310	Did you seek /take measure assistance for the problem(s)?	Yes.....01 No.....02 Don't Know.....98	If Yes →313
311	If your answer is no, why did you not seek assistance for this Problem (probe: Anything else)?	Respondent didn't think necessary-----01 Husband/family did not think necessary02 Facility too far03	

	Circle all the reasons mentioned.	No transport04 No childcare support at home05 Too expensive -----06 Services are poor-----07 Used home remedy-----08 Didn't know where to go-----09 No time to go -----10 Other (Specify) _____97 Don't know-----98	
312	Who made the final decision about whether or not to seek assistance for this problem?	Respondent.....01 Respondent & husband-----02 Husband03 Grand mother-----04 Friend/Neighbor.....05 Health professional -----06 TTBA..... 07 TBA.....08 Other _____99 (Specify) Don't know-----98	
313	If sought assistance, did you go to a health facility?	Yes01 No02	If no ➔ Sect.4
314	Which facility did you go first?	Government hospital01 Government health center02 Health post03 Private clinic04 Other _____99 (Specify)	

Section 4: Practices related to last childbirth

Q#	Questions	Codes	Go to Q./Sect.
401	Where did you give birth to your last child?	Respondent's home01 TTBA'S home.....02 TBA'S home.....03 Parents home.....04 Hospital -----05 Health center-----06 Health post07 Other (Specify)_____ 97	
402	During labor and childbirth, have you experienced any traditional practices?	Yes-----01 No-----02 Don't-----98	If No ➔ 405
403	If yes, what traditional practices during labor & childbirth did you experienced?	1. Abdominal massage----- 1.yes 2. no 2. Shaking in prolonged labor---1. yes 2. no 3.Drastic measure to hasten labor--1.yes 2.no Others(write those mentioned by the mothers) _____ 97	
404	If the answer is yes, what do you think are the reasons for doing this?	To correct the position of presenting part---01 To facilitate labor -----02 Traditionally believed as it is good-----03 Other reasons (specify) _____ 97	
405	If you have given birth at home, on what materials did you delivered?	On bed-----01 On the floor covered with mattress-----02 On the floor covered with hide -----03 Simply on the floor (with out cover)-----04 Other materials (specify) _____ 97	
406	Prior to this birth, did you or your family make any arrangements for the birth of this child?	Yes01 No02 Don't know..... 98	If No ➔ 409
407	What arrangements did you or your family members make for the birth of this child? (Probe: which of the following	Identify place of delivery-----01 Save money.....02 Prepare essential items for clean delivery & post partum period -----03 Identify skilled provider-----04	

	arrangements?) multiple responses possible	PMTCT05 Other(specify)97	
408	Who made the final decision to make these mentioned arrangements?	Respondent01 Respondent & husband.....02 Husband.....03 Respondent's mother.....04 Friend/Neighbor.....05 HEWs-----06 T/TBA07 Grand mother-----08 Other(Specify)97 Don't know-----98	
409	Who made the final decision about where you would give birth?	Respondent01 Respondent & husband.....02 Husband.....03 Respondent's mother04 Friend/Neighbor.....05 HEWs-----06 T/TBA07 Grand mother-----08 Other (Specify)97 Don't know-----98	
410	If gave birth other than home, who accompanied you to the place where you gave birth (Record all mentioned by the mother)?	No one01 Husband02 Mother-----03 Sister/ Brother.....04 Friend/Neighbor.....05 HEWs-----06 T/TBA.....07 Grandmother.....08 Other (Specify)97 Don't know-----98	
411	If not gave birth in health facility, can you tell me the reasons why you did not give birth in a health facility? (Probe: What else?)	Respondent didn't think necessary.....01 Family didn't think necessary -----02 Facility too far.....03 No transport04 No childcare support at home.....05 Services are too expensive.....06 Services are poor.....07 Didn't know where to go-----08 No time to go09	

		No companion-----10 My husband don't allow-----11 HWs don't advice-----12 Trust in traditional birth attendants -----13 I was told my pregnancy is normal-----14 Previous home delivery was normal-----15 Facility not open regularly-----16 Bad approach of health workers-----17 Other (Specify)_____97 Don't know-----98	
412	Who assisted you with the last childbirth? (Probe: Any one else)?	Doctor.....01 Health officer.....02 Nurse/Midwife.....03 TTBA.....04 TBA.....05 Grand mother.....06 HEWs-----07 Family.....08 Neighbors/friends-----09 Other (Specify) _____97 Don't know-----98	
413	During last childbirth, did you experience any serious health problems?	Yes01 No.....02 Don't know.....98	If No ➔Sect.5
414	If yes what problems did you experience during last childbirth? (Probe; ask for the problems which are not mentioned spontaneously). Record all the problems mentioned.	Severe vaginal bleeding.....01 Severe headache.....02 Convulsions.....03 High fever04 Loss of consciousness.....05 Labor lasting>12/18 hours.....06 Retained placenta (>30minutes).....07 Other (Specify)_____ 97	

415	Where were you when you developed this problem?	Home 01 T/TBA's home.....02 Other home.....03 Hospital04 Health center.....05 health post06 Other (Specify) _____97	
416	Did you seek assistance/take measure for this problem?	Yes01 No02 Don't know.....98	If Yes ➔ 418
417	If no, why did you not seek assistance for this problem (probe: Anything else? Record all the reasons mentioned.	Respondent didn't think necessary 01 Husband/family didn't think necessary.....02 Facility too far.....03 Transport.....04 No childcare support at home.....05 Too expensive.....06 Services are poor.....07 Used home remedy.....08 Do not know where to go09 No time to go.....10 Other(Specify) _____97 Don't know-----98	
418	If sought assistance, did you go to a health facility?	Yes 01 No02	If No ➔ Sect.5
419	Which facility did you go first?	Hospital01 Health center02 Health post03 Private clinic04 Other(Specific) _____97	

Section 5: Practices related to immediate post partum period

(With in 24 hours)

Q.#	Questions	Codes	Go to Q.
501	Did you experience any serious health problems related to the birth after delivery?	Yes01 No02 Don't know98	If No ➔ 504
502	What health problems did you experience? (Probe; ask for the problems which are not mentioned spontaneously).	Severe vaginal bleeding.....01 Convulsions.....02 High fever03 Loss of consciousness-----04 placenta delayed more than 30 minutes after baby delivered.....-.....05 Inability to control urine/faces/both----06 Offensive vaginal discharge-----07 Other (Specify) _____97 Don't know-----98	
503	Did you seek assistance for this problem?	Yes01 No 02 Don't know98	
504	Was your last birth alive?	Yes01 No 02	If No➔ section 6
505	If yes, what material was used to cut the umbilical cord?	New/boiled razor blade-----01 Used non boiled razor-----02 Un boiled scissors-----03 Knife-----04 Other materials _____97 (specify)	
506	Was the umbilical cord tied?	Yes-----01 No-----02 Don't remember-----98	

507	Were materials applied to the umbilical stump?	Yes-----01 No-----02 Don't know-----98	
508	If yes, what materials did you applied?	Dung-----01 Mud-----02 Butter-----03 Others(specify) _____97	
509	Did you give butter and other liquids to the new born baby?	Yes-----01 No-----02 Don't know-----98	
510	How long after birth did you first put the baby to the breast?	During the first hour after birth 01 More than one hour02 Don't know98	

Section 6: Women's perception towards HEWs' family health service provision and health service utilization.

Q.#	Questions	Codes	Go to Q.
601	Do you think that a woman might experience additional health risks during pregnancy and childbirth?	Yes01 No02	
602	Do you think giving birth at home has risks?	Yes01 No02	
603	HEWs at health post are skilled enough to detect and treat or refer pregnancy related complications.	Agree.....01 Disagree-----02 In different-----03	
604	HEWs at health post are skilled enough to manage normal delivery.	Agree -----01 Disagree-----02 In different-----03	
605	HEWs at health posts are skilled enough to detect and treat or refer delivery complications.	Agree-----01 Disagree-----02 In different-----03	
606	Is there health facility in your vicinity?	Yes -----01 No-----02	If no → Q 610
607	If yes, how far is it?	_____kms or _____walking hours	
608	What type of health facility is it?	Health post-----01 Growing health center-----02 Health center-----03 Private clinic-----04 other specify_____05	
609	Does the health facility provide delivery care?	Yes -----01 No-----02 I do not know-----03	
610	Have you ever used any modern health facility?	Yes-----01 No-----02 I do not know-----03	If No → 617
611	If yes, what services did you get so far?	ANC-----01 Delivery-----02 PNC-----03 Immunization-----04	

		VCT-----05 Family planning-----06 Curative services-----07 Other specify-----98	
612	Have you ever given births at HF's?	Yes-----01 No-----02	
613	If yes, how did you receive the service?	Free of charge-----01 On payment basis-----02 I do not remember-----03	
614	If you received on payment, how much did you pay during your most recent HF delivery service?	-----ETB	
615	What was your opinion on the payment?	Difficult to pay-----01 Fair-----02 Cheap-----03 I do not have suggestions-----04	
616	Were you able to pay for the services?	Yes-----01 No-----02	
617	Who decides your health service utilization?	Self-----03 Husband-----04 Relatives-----05 Grandmother -----06 Religious leader-----07 Other specify_____ 08	
618	If not ever used modern health care services, what are the reasons?	Facility too far-----01 Not seriously ill-----02 High cost of facilities-----03 Presence of traditional healers-----04 Too busy with HHs chores-----05 Others specify-----06	
619	Are you satisfied with HEWs ANc, delivery & PNC service provision role?	Yes-----01 No-----02	

Annex 3. Semi structured questions for HEWs in-depth interview

1. For how long have you been working in this health Post?
2. How many mothers did come for the last 6 month to get maternal health care?
3. What are the main maternal health care Services you gave for the mothers?
4. Did you refer mothers for the last six months?
If yes, for what reason(s)? (Multiple answers are possible)
6. What were the mothers' main health problems for referral?
If not referred what where the reasons?
Have you ever conducted labor?
If yes, how many mothers did you assist during the last 6 months?
If no, what was the reason?
7. Do you know some of the danger signs that occur during pregnancy and childbirth?
If yes, what danger signs do you know that occur during pregnancy?
8. What danger signs do you know that occur during childbirth?
9. What danger signs do you know that occur during the post partum period?
10. Do you know some of the health related MDGs?
11. Can you mention some of the main health related MDGs?
12. What are some of the activities that help to achieve the MDGs particularly maternal health improvement at this level?
13. With whom are you making coordination?
14. Is there any disagreement between you and other community based health workers?
If yes with who were the disagreement made?
15. What is/are the reason(s) for this conflict?
16. Was there any proposed solution/ effort made by you to avert the conflict?
17. What are the common traditional practices done by the mothers or community during pregnancy and childbirth in your community?
18. What were your efforts to avert such harmful traditional practices?

Annex 4. Guiding questions for Focus Group Discussions

Register age of participants_____

1. What are the most common maternal health problems in your area?
2. Where do you think women in this area go to get solution for their health problem?
(Especially pregnancy and childbirth related problems)
3. What maternal health services do you think are available in your nearby health facility (health post)?
4. Why do you think women prefer to get treated with modern or traditional medicine?
5. As it is known from reports of health institution, women's utilization of maternal health care is low. What do you think are the reasons, for example for low attending of ANC and not giving birth in the health institution by the women?
6. Are you satisfied or dissatisfied with the maternal health care services given by HEWs/other health workers in the health posts/other health facilities? Elaborate some of the reasons.
7. What traditional practices are done in this area by the mothers or the community especially during pregnancy and childbirth assuming it will benefit the mother's health?
8. What traditional practices are done in this area by the mothers or the community immediately after delivery assuming it will benefit the child's health?
9. Who make decision in your community for the pregnant mother to go for ANC, HIV counseling testing, immunization and skilled delivery services?
10. If a woman during pregnancy or childbirth got a serious problem and referred, can she readily go to the referred site with out delay? What difficulties she would face in terms of decision, transport, money....?
11. When do you say a women during pregnancy or childbirth is in a dangerous heath status?
12. What are strengths and limitations of health posts/ other health facilities in the provision of maternal health care?
13. What do you think are the possible solutions to improve maternal health in your area?

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This thesis work has been submitted for examination with my approval as university advisor.

Name: Dr. Mullugeta Betre (MD, MPH)

Signature: _____

Date: _____