

MAGNITUDE AND ASSOCIATED FACTORS FOR INSTITUTIONAL DELIVERY SERVICE AMONG WOMEN WHO GAVE BIRTH IN THE LAST 12 MONTHS IN AYSSAITA DISTRICT, NORTH EAST ETHIOPIA: A COMMUNITY BASED CROSS SECTIONAL STUDY-2015

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**Abstract**

**Background:** Proper medical attention and hygienic conditions during delivery can reduce the risk of Complications and infections that can cause the death or serious illness of the mother and/or the newborn baby. Institutional delivery by skilled attendants is very important to reduce maternal and infant mortality; however, there is a paucity of data on the magnitude and associated factors especially in the agro-pastoral communities. **Objective:** To assess the magnitude and associated factors for institutional delivery service among women of reproductive age who gave birth in the last 12 months preceding the survey in Ayssaita district. **Methods:** A community-based cross-sectional study was conducted from April 27- 09 March 2015. Data were collected from a sample of 580 women in the district using structured questionnaire. Bivariate and multivariate analyses were conducted and Odds ratio with 95% CI was estimated to identify predictors of institutional delivery care utilization. Statistical level of significance was declared at  $p < 0.05$ . **Results:** The study revealed that 36.1% of deliveries were assisted by a skilled health professional at a health institution. Four hundred ninety-six (86.4%) of women attended at least one antenatal care visit during last pregnancy. Among women who attended ANC, more than half (74.6%) of the women made their first visit during second and third trimester of pregnancy and 49.9% had less than four antenatal visits. Women's educational level (AOR=2.46, 95% CI=1.39,4.34,AOR=2,88,95% CI=1.43,5.81)and husbands educational status(AOR=0.39,95% CI=0.19,0.79), marital status (AOR=3.97,95% CI=1.07,14.70),and frequency of ANC visit (AOR=3.23, 95% CI=1.02,10.27) were positively associated with institutional delivery care utilization. **Conclusions:** The utilization of institutional delivery care services is inadequate in the study area. Improving the status of women by expanding educational opportunities, strengthening health extension workers to create community awareness of the program with the focus on obstetric danger signs of pregnancy and place of delivery are warranted.

**Keywords:** Antenatal care, delivery care, and Ayssaita district.

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## Introduction

**Background:** According to WHO, “Skilled birth attendant” or “skilled health personnel” refers to a health professional such as a midwife, doctor or nurse, who is trained and competent in the skills needed to manage normal childbirth and the immediate postnatal period, and who can identify complications and, as necessary, provide emergency management and/or refer the case to a higher level of health care (WHO, 2008).

Institutional delivery means when a pregnant mother gives birth at health institution assisted by skilled birth attendants. Proper medical attention and hygienic conditions during delivery can reduce the risk of Complications and infections that can cause the death or serious illness of the mother and/or the newborn baby (WHO, 2008)

The fifth Millennium Development Goal is to achieve a 75% reduction in maternal mortality and 2/3 reduction in child mortality between 1990 and 2015. Emergency obstetric care (EmOC), access to family planning, and skilled attendance at birth are three key interventions that have been implemented globally to reduce maternal mortality (WHO, 2004).

There are two types of EmONC; Basic and Comprehensive EmONC. Health Centers can give Basic Emergency Obstetric and Newborn Care (BEmONC) which includes administering of Antibiotics, Anticonvulsants, Uterotonics, Manual removal of the placenta, assisted vaginal delivery, Removal of retained products and Newborn resuscitation. Referral Facilities (Hospitals) gives Comprehensive Emergency Obstetric and Newborn Care (CEmONC) that includes Basic EmONC plus: Cesarean sections and Blood transfusion (WHO, 2009).

However, in spite of global efforts to reduce mortality, the World Health Organization (WHO) reports that the global maternal mortality ratio (i.e., the number of maternal deaths per 100,000 live births) declined by only 2.3% per year between 1990 and 2008 This is far from the annual decline of 5.5% required to achieve the fifth MDG(Adisasmita et al., 2008).

Wide disparities are found among regions in the level of skilled attendance at birth—ranging from nearly universal in Eastern Asia and the Caucasus and Central Asia (100 percent and 97 percent, respectively) to a low of about 50 percent in Southern Asia and sub-Saharan Africa, the regions with the highest levels of maternal mortality (United Nations, 2013).

Health problems during pregnancy may have serious consequences, not only for the woman but also for her child, her family, and her community as well. Maternal health has emerged as a global priority because of a great gap in the status of mother's well-being between rich and the poor countries. In developing countries, many women suffer from the ill health during pregnancy and childbirth (WHO, 2011).

Although most pregnancies and births are Uneventful, approximately 15% of all pregnant women develop a potentially life-threatening Complication that calls for skilled care and some required a major obstetrical intervention to Survive. If Emergency Obstetric Care is available, and women can access it in time, women's lives can be saved (WHO, 2002).

A promising intervention is the upgrading of health centers and other small facilities to enable them to provide basic EmONC. A health center that provides basic EmONC can prevent many maternal and perinatal deaths. For some conditions (e.g., some cases of postpartum hemorrhage [PPH]), basic care was sufficient; for other

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complications (e.g., severe preeclampsia, obstructed labor), higher-level treatment is required. Even then, first aid can save lives because a woman’s condition can be stabilized before she is referred (WHO, 2009).

**Statement of the problem:** In 2000 at the UN Millennium Summit, 147 heads of states adopted the Millennium Declaration, with the aim, among others, of reducing worldwide maternal mortality by 3/4 and 2/3 reduction in child mortality by 2015. The deadline is approaching and the progress to reduce maternal mortality has been slow. This is particularly worrying in sub-Saharan Africa where more than 162,000 women die each year during pregnancy and childbirth, most of them because they lack access to maternal health care, mainly skilled delivery attendance, comprehensive and basic emergency obstetric and neonatal care (United Nations, 2010; WHO et al, 2012).

Globally, the problem had a decline of 47% from levels in 1990. From 287 000 maternal deaths occurred in 2010, Sub-Saharan Africa (56%) and Southern Asia (29%) accounted for 85% of the global burden (245 000 maternal deaths) in 2010. At the country level, two countries account for a third of global maternal deaths: India at 19% (56 000) and Nigeria at 14% (40 000). The global MMR in 2010 was 210 maternal deaths per 100 000 live births, down from 400 maternal deaths per 100 000 live births in 1990. The MMR in developing regions (210) was 15 times higher than in developed regions. Sub-Saharan Africa had the highest MMR at 500 maternal deaths per 100 000 live births, while Eastern Asia had the lowest among MDG developing regions, at 37 maternal deaths per 100 000 live births (WHO, 2010 ).

In settings where maternal mortality is highest, three crucial delays are directly associated with elevated rates of maternal mortality: (1) delay in seeking health care

(delay in recognizing the problem and making a decision to seek care), (2) delay in reaching a health facility, and (3) delay in obtaining appropriate care upon reaching a health facility (Thaddeus and Maine ,1994). Women who give birth in rural areas are still at a disadvantage in terms of the care they receive. In 1990, 44 percent of deliveries in rural areas of the developing world were attended by skilled personnel, versus 75 percent in urban areas. By 2011, coverage by skilled birth attendants increased overall, but the urban-rural gap persisted: More than half (53 percent) of women in rural areas received skilled attendance at delivery, versus 84 percent in urban areas. In sub-Saharan Africa and Southern Asia, the gaps were even larger (United Nation, 2013).

Preventing high maternal morbidity and mortality to ensure that women including neonates receive appropriate care during delivery still remained one of the critical issues. One of the reports of United Nations Children's Fund (UNICEF) showed that 4 in 10 of all births worldwide are not assisted by skilled health personnel. Sub-Saharan Africa and South Asia have the lowest levels of skilled birth assistants and bear the greatest burden of maternal mortality (UNICEF, 2008).

Donnay pointed out that 98% of perinatal and maternal deaths due to pregnancy-related causes occur in developing countries (Asia and Sub-Saharan Africa), with India alone accounting for 25% of such deaths worldwide while six other countries – Bangladesh, Ethiopia, Indonesia, Nepal, Nigeria, Pakistan accounts for a further 30%. At present, 1 woman in 12 died of maternal causes in Sub-Saharan Africa, compared with 1 woman in 4000 in northern Europe and perinatal mortality rate 10/1000 live births (Donnay, 2000; WHO/FRH/MSM, 1996). Ethiopia is also among the 10 countries with the highest numbers of intrapartum-related neonatal

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deaths and intrapartum stillbirths (Lawn et al., 2009).

Existing evidence suggests that in any population, 1-2 percent of pregnant women were developing life-threatening obstetric conditions during childbirth. If they fail to receive rapid medical interventions, it is likely to result in a maternal death. While complications responsible for most maternal deaths are often unpredictable (Antwerp, 2013; Paxton et al., 2005).

The risk of dying from pregnancy in Africa is 1 in 16; in Asia, 1 in 65; and in North America, 1 in 3,700. The overall risk for developing countries is 1 in 48, whereas in industrial countries the risk is 1 in 1,800 (ICPD, 1994). A study done in 2008 has also shown that in sub-Saharan African countries, the progress towards achieving MDG5 has been slow because of a poor quality of care, low access, inadequate skilled personnel and financial barriers to care (Hogan, 2010).

In Ethiopia, only 15% of deliveries took place in health institution (CSA, 2014). Also only 3% of institutions that routinely provided all signal functions. 6% of women with obstetric complications were treated in health institutions, whereas only one-half of these women were treated in fully functional comprehensive EmOC facilities. The study concluded that far too few public institutions to meet the indicators set by the UN standards (Admasu Kebede et al., 2008)

The major immediate causes of maternal deaths in Ethiopia are infections/sepsis (47.1%), hemorrhage (29.4%), severe pre-eclampsia/eclampsia (7.6%), obstructed/prolonged labor and ruptured uterus (2.9%), with complications from unsafe abortion accounting for the remaining 2.9% of maternal deaths. The indirect obstetric causes are anemia, HIV/AIDS, and cardiovascular diseases and account for 10% of maternal deaths (Samuel Hailu et al., 2009).

A few studies carried out in some parts of Ethiopia shows that Place of residence, Antenatal Care visit and maternal and husband educational level, birth order and parity were found to be associated with institutional delivery service utilization (Abdella Amano et al., 2012; Asmeret Moges, 2013; Daniel Bogale and Desalegn Markos, 2014).

Community-based studies, which can clearly show the effects of place of residence, husband and women education and parity on the utilization of institutional delivery with the target population of women who gave birth 12 months prior to the survey has less conducted in the study area. Researchers have devoted considerable attention to the importance of accessibility to health services on health outcome in the country, little is known about the status and factors influencing the use of delivery service in a rural area particularly Afar Region. Studies have found that care during pregnancy, delivery, and postnatal period can positively improve the health of the mother and infant. Also, the existence of gap among regions in health facilities delivery being very low in Afar region compared to other regions in Ethiopia necessitated the need to find out factors that have to be considered is significant to improve delivery in health facilities in this region particularly in Ayssaita district. Therefore, this study is tried to identify the level of institutional delivery service and associated factors among women of reproductive age who gave birth in the last 12 months in Ayssaita district, Afar northeast, Ethiopia.

**The significance of the study:** The information obtained will be useful for the community and decision makers at the district and regional level in planning, implementing and evaluating various interventions related to research findings to reduce maternal and neonatal mortality rate.

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Understanding of the utilization level of institutional delivery and associated factors at the community is very crucial in designing and implementing interventions that increase the institutional delivery care services in Ayssaita District.

### 1) General Objective

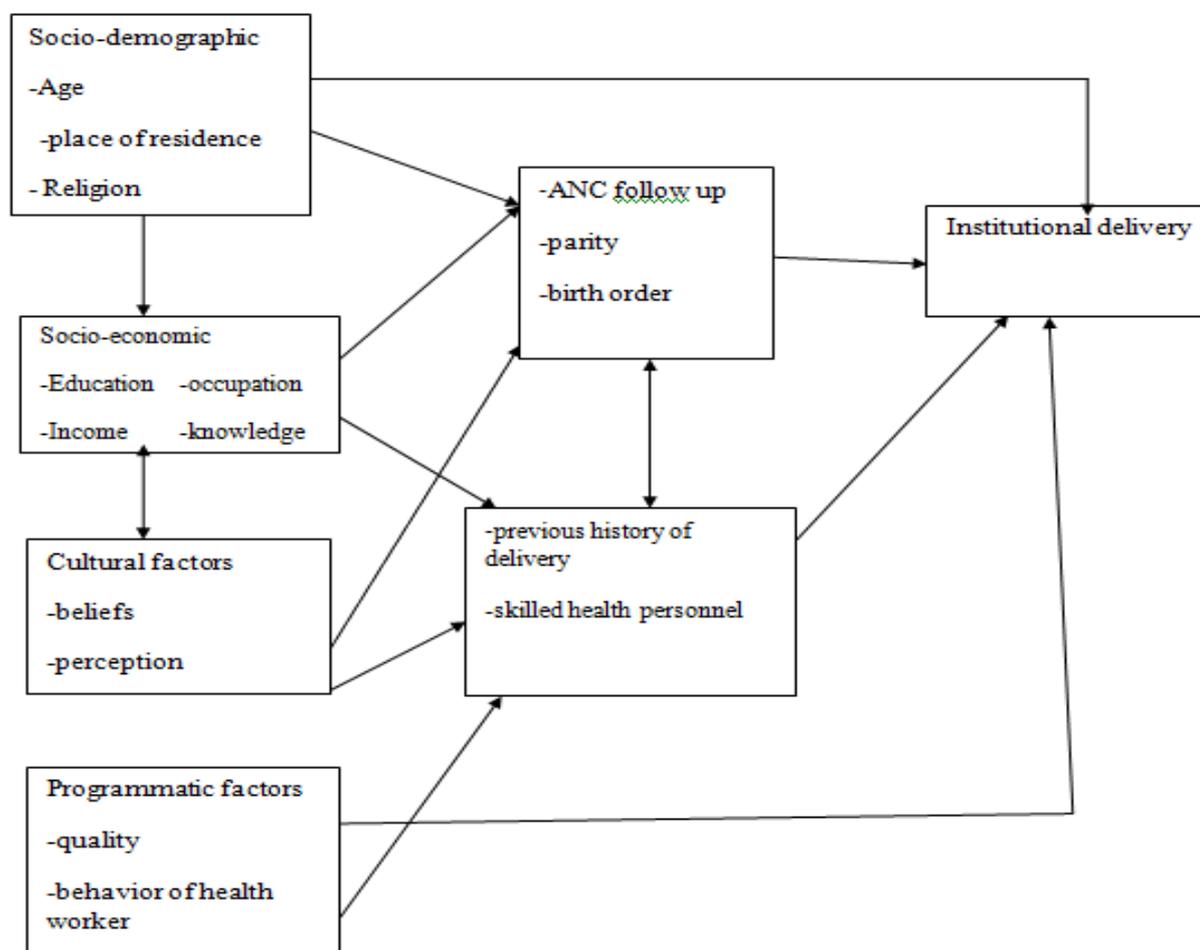
- To assess the magnitude and associated factors for institutional delivery service among women who gave birth in the last

12 months preceding the survey in Ayssaita district, afar, northeast Ethiopia from Feb 27-March 09,2015.

### 2) Specific objectives

- To determine the level of institutional delivery service in Ayssaita district.
- To identify factors that influence women’s utilization of institutional delivery service in Ayssaita district

**Figure1.** A conceptual framework to investigate factors associated with maternal institutional delivery care utilization among women of reproductive age in Ayssaita district, Afar, 2014/2015.



Source: Adapted from Asmeret Moges Mehari. (2013)

### Method and Materials

**Study Area and Period:** Afar Region has five zones & 31 woredas(Districts). Ayssaita is one of the 31

woredas in the region and relatively with the highest number of health facilities one hospital, one Health center and five clinics. Each health station is within a distance

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ranging 5-17kilometres from the main town. The study area is Ayssaita district located in zone one, Afar region North East, Ethiopia. It is about 700 Km from Addis Ababa with an estimated population of 64,393 of which 34,382 are males and 30, 011 females and the expected numbers of pregnant women are 2576 (CSA; 2011). The District is subdivided into 2 urban and 11 rural kebeles (Smallest administrative units of Ethiopia). The woreda though it is found in pastoralist region; it has a relatively settled population. However, the utilization of health services in general and maternal healthcare service, in particular, is very low even lower than the national coverage figure. According to EDHS (Ethiopia demographic and health survey), 2011 the antenatal and delivery care in Afar region was 32.3% and 6.6% respectively. The study was done in Ayssaita district, afar, northeast Ethiopia from Feb. 27– Mar. 09, 2015.

**Study Design:** Community-based cross-sectional study design was employed for the quantitative study.

- 3) **Source population:** All women who gave birth in the last twelve months in the Ayssaita district, northeast Ethiopia.
- 4) **Study Population:** Women who gave birth in the last twelve months period preceding the study and residing in the district for at least 6 months from randomly selected kebeles.
- 5) **Inclusion criteria:** Women who delivered during a one year period preceding the study and who are residing in the study area for 6month.
- 6) **Exclusion criteria:** Women who had delivered during the reference period in the study area but are critically ill and or are unable to talk or listen during the data collection period.
- 7) **Sample Size Determination:** For objective 1: usage level of institutional delivery care among women of

reproductive age (15-49). The sample size was determined by using the formula for single population Proportion based on the assumptions: in the previous prevalence data on the population under study, p was 0.066 with 3% margin of error and 95% confidence level of certainty. The actual sample size was calculated using single population proportion formula.

$$n = \frac{(z \alpha/2)^2 \cdot P(1-P)}{d^2} = \frac{(1.96)^2 \cdot 0.066(1-0.066)}{(0.03)^2}$$

Where: P= Prevalence of institutional delivery utilization the region was 6.6% (CSA, 2011)

d =the margin error between the sample and the population (0.03).

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

The calculated sample size=263.

10% non response rate=26. design effect=2

Total= 580 sample of women of reproductive age who had given birth 12 months before the date of data collection.

**For objective 2:** Factors associated with institutional delivery care, Sample size was calculated using EPI-Info version 3.3.2 statistical software program for two population proportions formula: To determine the sample size the following assumption was made: women's knowledge was found to be factor determining utilization of delivery service (Daniel Bogale and DesalegnMarkos, 2014; Yealem Tsegayet al., 2013; Worku Awokeetal., 2013; Gurmesa Tura et al, 2008) where,

P1=Proportion for women with knowledge of delivery service, 14.5% (nonexposed) (Gurmesa Tura et al,2008).

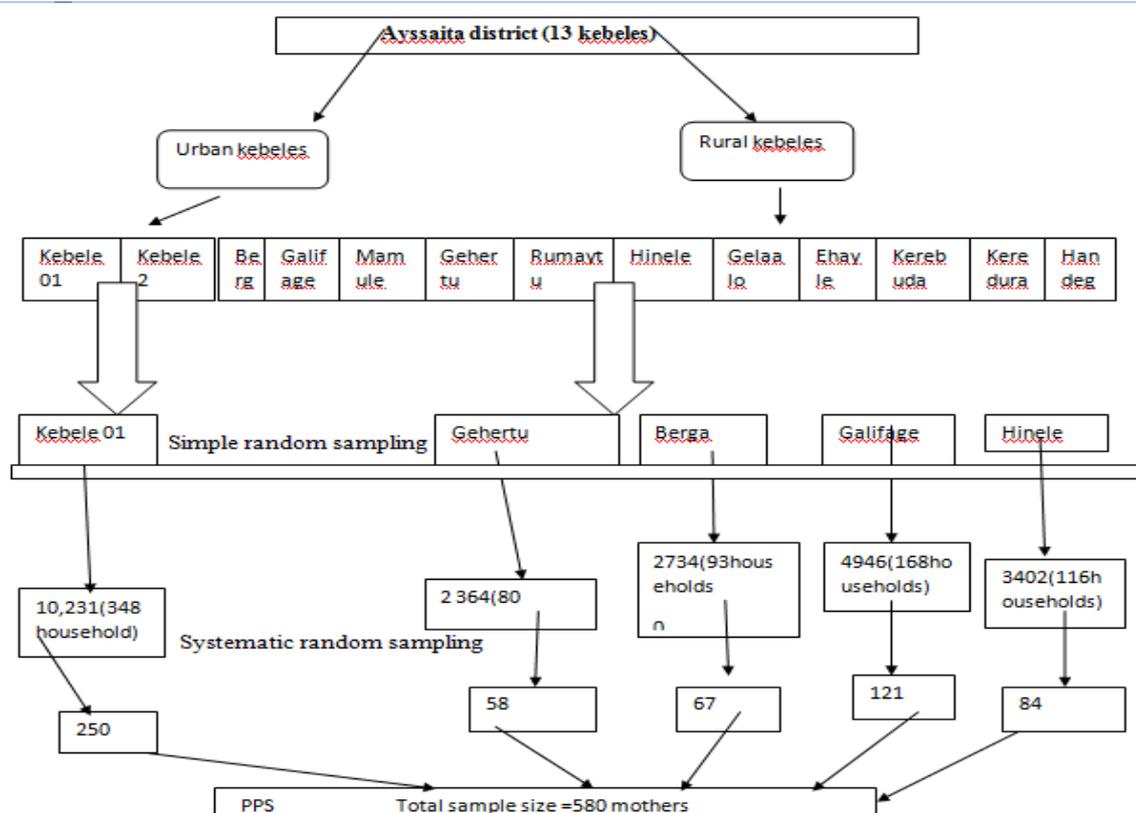
P2=Proportion of women with no knowledge of delivery service, 3.2% (exposed) (Gurmesa Tura et al, 2008)

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The sample size was 115 for with no knowledge of delivery service and 115 for women with knowledge on delivery service. Considering non-response rate of 10%. And design effect two the total calculated sample size was 506 women of reproductive age who had given birth 12 months prior to the date of the data collection. By comparing the two sample sizes calculated using single and double population formula which is 506 and 580 respectively, the larger sample size (580) was the total sample size for the study.

8) **Sampling technique:** In this study, a multi-stage sampling technique was applied to select study subjects. The district was divided into urban and rural kebeles. Urban consists of two kebeles and the rural consists of eleven kebeles.

One Kebele from urban, four kebeles from the rural district were identified, using simple random sampling method. Then sampling fraction for each of the selected kebeles was determined by probability proportional sampling method. Then used a systematic random sampling technique to reach each sample households. Whenever more than one eligible respondent was present in the same selected household, only one respondent was chosen by lottery method (simple random sampling). Revisits of three times were being made in the case where eligible respondents were not available at the time of the survey.



**Fig 2:** Diagrammatic presentation of a sampling technique for the study magnitude and associated factors for institutional delivery care service among women who gave birth in the last 12 months in Ayssaita district, northeast Ethiopia, 2015.

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9) **Data collection tools:** The design of the quantitative study was used to determine institutional delivery care utilization and associated factors. Quantitative data was collected using a structured interview questionnaire which is adapted from JHPIEGO (JHPIEGO, 2004). The questionnaire was prepared in English, translated to Amharic and local language (Afargna) and retranslated to English by different individuals to check for conceptual equivalence. The interview questionnaire had three parts: Socio-demographic and economic parts, women's autonomy, questions related to the history of recent pregnancy and childbirth. It consisted of 42 interview questions. The pretest was done on respondents of the same characteristics to the study subject outside the kebeles not included in the study.

10) **Data collection procedure:** Eight female diploma holder data collectors were recruited and trained by the principal investigator for two days on details of interviewing technique with respect to the questionnaire provided. And two BSC nurse supervisors were assigned from district health bureau. The responsibilities of the supervisors were checking whether the questionnaires are correctly completed or not. The enumerators and supervisors were given training for two days on procedures, techniques, and ways of collecting the data. The questionnaires were pretested in a community similar to the study population urban and rural kebeles before beginning the actual data collection process and the necessary modification was made and care was taken not to include those who already participated in the pretest.

11) **Dependent variable:** Utilization of institutional delivery service

12) **Independent variables:** Sociodemographic characteristics (age, religion, marital status, parity and place of residence.) Socio-economic characteristics (education Level women and husband occupation, and household income.). Other variables are traditional beliefs.

**Operational definitions:**

Access to health facility; -the pregnant women being no more than an hour from health facility by local means of transportation, or availability of health facility within one hour's walk or travel.

Institutional delivery: a woman who delivered at health institution and attended by skilled health personnel.

Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Practice means when a mother uses institutional delivery service.

Skilled attendants refer to people with midwifery skills who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer obstetric complications' (nurses, midwives, doctors, health officers) (WHO). Data Quality Control:

To assure the quality of data, properly designed data collection instruments were developed. Training was given for data collectors and supervisors'. Everyday 5% of the collected data was reviewed and checked for completeness and relevance by the supervisors and principal investigator for immediate action. The data collector and supervisors were given intensive training on its objective. Also conducted pretest for data quality. Double data entry was used to avoid data entry

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errors. Data cleaning was done to identify errors.

**Data Analysis:** Data was entered into EPI-data 3.0 and transported to SPSS Version20 for further processing and computation. Frequencies, percentages and summary statistics were computed to describe the study population in relation to relevant variables. The bivariate analysis using cross tabulation was done to see the association between dependent and independent variable. Multivariate logistic regression analysis was employed to control for possible confounding effects and assessed the separate effects of each variable. The odds ratio was calculated with 95% confidence interval and determine the strength of association. Variables found to be significant ( $p < 0.2$ ) in a bivariate analysis was used in multiple variable models also based on context and previous study result. Statistical significance was considered with two sides P-value Of 0.05.

**Ethical Consideration:** Ethical clearance was obtained from the Haramaya University Institutional Research Ethics Review Committee. Also, permission was obtained from the Ayssaita district Health Office.

Written and signed a consent to participate in the study was secure before conducting the interview. For this, a consent letter attached to cover page of each questionnaire stating about the general purpose of the study and issues of confidentiality to be discussed by interviewers before proceeding the

interview. Additionally, participants were informed that they have a full right to refuse or discontinue participating.

### Results

**Socio-demographic and economic characteristics of the respondents:** In this study a total of 574 women who gave birth in the last twelve month prior to the date of data collection were interviewed with a response rate of 98.96% Out of those who did not respond to the questionnaire, three were not available at home for three visits and the rest refused without giving specific reasons.

Most of the study participants (83.1%) were in the age group of 20-34 with the mean age of 26.5  $SD \pm 5.33$  years. The vast majority, 516(89.9%) of the respondents were Muslims and 53(9.2%) of them were Orthodox. Out of total respondents, 327(57%) of the women were Afar followed by Amhara, 212 (36.9%). Regarding women's literacy, 360(62.7%) of the respondents never attended formal school and, 103(17.9 %) of women attended elementary education whereas, 111(19.3%) women attended secondary and above education. More than three fourths, 503 (87.6%) of the respondents were a housewife while only 71(12.4%) were employed. Out of the total respondents, 369 (64.3%) were reported that decision making for seeking health care service was decided together, 124(21.3%) of the women decided by themselves and, 71(12.4%) decision making made by husbands.

**Table 1:** Percentage distribution of Sociodemographic and economic characteristics of respondents in Ayssaita district, North Eastern, Ethiopia, March 2015

| Variables | Frequency(n=574) | Percentage (%) |
|-----------|------------------|----------------|
| Residence |                  |                |
| Urban     | 249              | 43.4           |
| Rural     | 325              | 56.6           |

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|   |     |      |
|---|-----|------|
| Age                                       |     |      |
| 15-19                                     | 47  | 8.2  |
| 20-34                                     | 477 | 83.1 |
| 35-49                                     | 50  | 8.7  |
| Religion                                  |     |      |
| Muslim                                    | 516 | 89.9 |
| Orthodox                                  | 53  | 9.2  |
| Others                                    | 5   | 0.9  |
| Ethnicity                                 |     |      |
| Afar                                      | 327 | 57   |
| Amhara                                    | 212 | 36.9 |
| Others                                    | 35  | 6.1  |
| Women's education                         |     |      |
| No formal education                       | 360 | 62.7 |
| Elementary school                         | 103 | 17.9 |
| Junior or high school                     | 62  | 10.8 |
| College/higher                            | 49  | 8.5  |
| Marital status                            |     |      |
| Married                                   | 556 | 96.9 |
| Divorced                                  | 8   | 1.4  |
| Widowed                                   | 10  | 1.   |
| Husband education                         |     |      |
| No formal education                       | 335 | 58.4 |
| Elementary school                         | 62  | 10.8 |
| Junior or high school                     | 57  | 9.9  |
| College/higher                            | 120 | 20.9 |
| Women's Decision making on health seeking |     |      |
| Jointly                                   | 369 | 64.3 |
| Her Self                                  | 124 | 21.3 |
| Husband                                   | 71  | 12.4 |
| Others                                    | 10  | 1.7  |
| Employment status                         |     |      |
| House wife                                | 503 | 87.6 |
| Employed                                  | 71  | 12.4 |

**Obstetric characteristics of the respondents:** Almost half, 280(48.8%) of the women had 2-4 children followed by one third, 155(27%) had one child whereas, 139(24.2%) of women had five and above children with mean children of  $2.98 \pm 1.76$ . Concerning women's reaction to the pregnancy majorities, 554(96.5%) were with

intended pregnancy whereas, 20(3.5%) were unintended (either unwanted or mistimed). Only 127 (22.1%) of the respondents were aware at least one obstetric danger sign during recent pregnancy while, 447(77.9%) were not aware at all about danger sign during recent pregnancy (Table2).

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**Table 2: Obstetric characteristics of respondents in Ayssaita District, North Eastern Ethiopia, 2015 March**

| Variables  | Frequency(n=574) | Percentage (%) |
|--|------------------|----------------|
| <b>Parity</b>  |                  |                |
| 1  | 155              | 27             |
| 2-4  | 280              | 48.8           |
| 5+   | 139              | 24.2           |
| <b>Awareness of at least one obstetric danger signs of Pregnancy</b> |                  |                |
| Yes  | 127              | 22.1           |
| No   | 447              | 77.9           |
| <b>Gravidity</b>   |                  |                |
| Primigravida   | 71( 48.3)        | 76(51.7)       |
| Multigravida   | 136(31.9)        | 291(68.1)      |

**Maternal health care utilization:** Out of the women included in the study 496 (86.4%) of the women attended at least one antenatal visit during their last pregnancy. The majority, 428 (74.6 %) of the women made their first antenatal visit below sixteen weeks of pregnancy, 67 (11.7%) in their sixteen and twenty-eight weeks of pregnancy. Among the antenatal care service users, 286 (49.9%) had less than four antenatal contacts and, 210(36.6%) reported to have four or more antenatal visits at the time of the interview (Table 3).

Out of the total study participants, 207 (36.1%) of the deliveries were assisted by skilled health professional whereas, 367(63.9%) by non skilled health professionals: including, Traditional birth attendants 104(18.1%), mother, 123 (21.4%), Health extension workers, 43(7.5%) and relative 92(16%). Regarding the place of delivery, about 207 (36.1%) deliveries took place in the health institution while the remaining, 367(63.9%) at home. ( Table 3)

**Table 3: Maternal health care utilization among the respondents in Ayssaita district, northeastern Ethiopia, 2015 March**

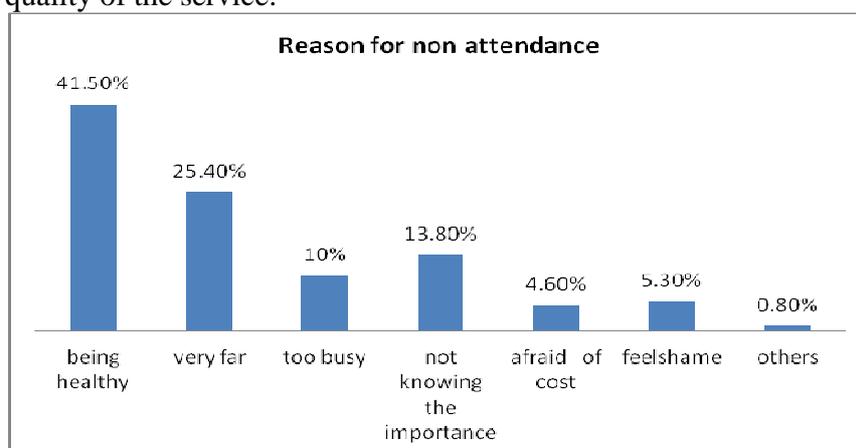
| Variables                                   | Frequency (n) | Percentage (%) |
|---|---------------|----------------|
| <b>Place of delivery(n=574)</b>             |               |                |
| Health facility                             | 207           | 36.1           |
| Home  | 367           | 63.9           |
| <b>ANC attendance at least once(n=574)</b>  |               |                |
| Yes   | 496           | 86.4           |
| No  | 78            | 13.6           |
| <b>The timing of first ANC visit(n=496)</b> |               |                |
| <4 months                                   | 428           | 74.6           |
| 4-6months                                   | 67            | 11.7           |
| 7-9months                                   | 1             | 0.2            |
| <b>Number of ANC visit(n=496)</b>           |               |                |
| 1   | 21            | 3.7            |

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|   |     |      |
|---|-----|------|
| 2-3                                       | 265 | 46.2 |
| 4 <sup>+</sup>                            | 210 | 36.6 |
| Place of ANC attendance (n=496)           |     |      |
| Hospital                                  | 472 | 82.2 |
| Health center                             | 15  | 2.6  |
| Health post                               | 9   | 1.6  |
| Skilled attendance at delivery(n=574)     |     |      |
| Yes                                       | 207 | 36.1 |
| No  | 367 | 63.9 |
| Non skilled attendance at delivery(n=367) |     |      |
| Traditional birth attendants              | 104 | 18.1 |
| Mother                                    | 123 | 21.4 |
| HEWS                                      | 43  | 7.5  |
| Relative                                  | 92  | 16   |
| Others                                    | 5   | 0.9  |

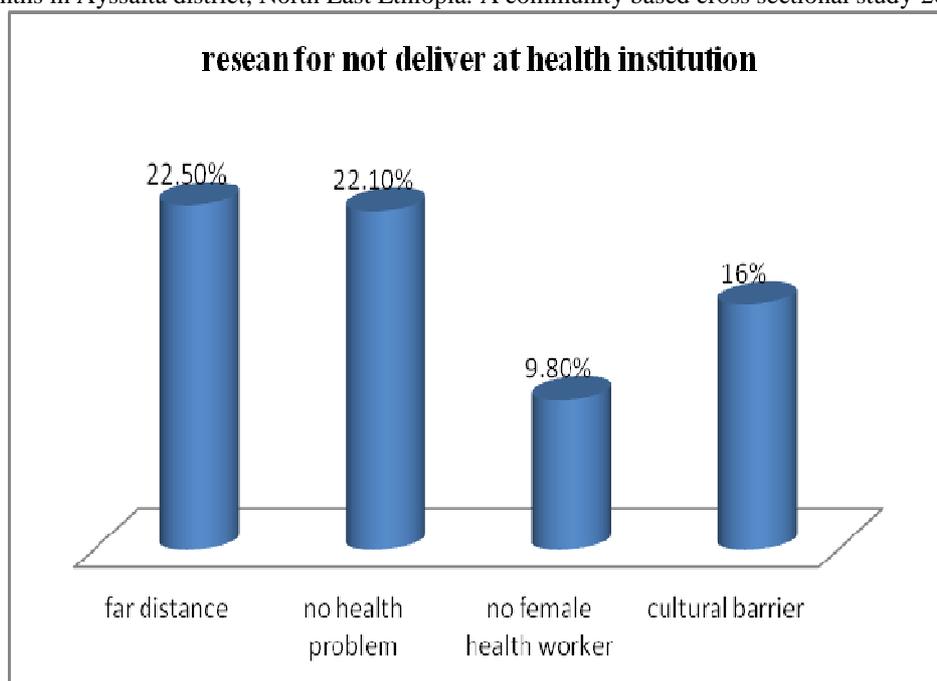
**Reasons for non attendance of Antenatal and delivery care:** Non users of antenatal care were,- asked about reason(s) for not attending of ANC service, less than half, 54(41.5%) reported that being in a state of healthy, 33(25.4%)very far from health facility,13(10.0%) due to too busy , 18(13.8) not knowing the importance antenatal care use, 6(4.6%)afraid the cost,5(3.8%) feel shame to attend ANC, and only1(0.8%) reported poor quality of the service.

Women who didn't receive delivery service were asked about the reasons for non attendance of it, 129 (22.5%) of women reported far distance from health facility, 127(22.1) said no health problem to attend delivery care, 56(9.8%) of the women reported no female health worker, 92(16) reason for non attendance of delivery care was due to cultural barrier.



**Figure 3;** Reason For Non Attendance Of ANC

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**Figure 4;** Reason For Not Deliver At Health Institution

**Socio-demographic Factors associated with institutional delivery care utilization:**

In the bivariate analysis, Women's age, residence, marital status, and educational level was significantly associated with institutional delivery care utilization. Mothers who were in ages between 18 and 29 were 1.7 times more likely to use institutional delivery care compared to those in the ages  $\geq 30$  (COR=1.7, 95% CI=1.2, 2.5). Women are living in urban area were 2.2 times more likely to deliver at health

institution than rural dwellers (COR=2.2, 95%CI= 1.54, 3.1). Marital status of the women also has a significant association with institutional delivery. Women who are living in the marital union were 2.9 times more likely to deliver institutionally than their counterparts (COR= 2.9, 95% CI=0.83, 10.1). Women with high school level education were 3.47 times higher than women with no education (COR= 3.47, 95% CI = 1.99, 6.03).

**Table 4:** Bivariate Sociodemographic and economic characteristics of respondents in Ayssaita district, North Eastern, Ethiopia, March 2015

| Explanatory Variables | Delivery care utilization |           | COR(95%CI)     |
|-----------------------|---------------------------|-----------|----------------|
|                       | Yes (%)                   | No(%)     |                |
| Age group of women    |                           |           |                |
| <18                   | 7(33.3)                   | 14(66.7)  | 1.28(0.5,3.34) |
| 18-29                 | 146(40.4)                 | 215(59.6) | 1.7(1.2, 2.5)  |
| $\geq 30$             | 54(28.1)                  | 138(71.9) | 1              |
| Residence             |                           |           |                |

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|                       |           |           |                  |
|-----------------------|-----------|-----------|------------------|
| Urban                 | 115(46.2) | 134(53.8) | 2.2(1.54,3.1)    |
| Rural                 | 92(28.3 ) | 233(71.7) | 1                |
| Marital status        |           |           |                  |
| In marital status     | 204(36.7) | 352(63.3) | 2.9(0.83,10.1)   |
| Not in marital status | 3(16.7)   | 15(83.3)  | 1                |
| Religion              |           |           |                  |
| Muslim                | 184(35.7) | 332(64.3) | 1                |
| Orthodox              | 22(41.5)  | 31(58.3)  | 1.28(0.72, 2.28) |
| Others                | 1(20)     | 4(80)     | 0.45(0.05, 4.06) |
| Ethnicity             |           |           |                  |
| Afar                  | 86(26.3)  | 241(73.7) | 1                |
| Amhara                | 103(48.6) | 109(51.4) | 2.65(1.84, 3.81) |
| Others                | 18(51.4)  | 17(48.6)  | 2.97(1.46, 6.03) |
| women’s education     |           |           |                  |
| No education          | 98(27.2)  | 262(72.8) | 1                |
| Elementary            | 53(51.5)  | 50(48.5)  | 2.83(1.81,4.45)  |
| High school           | 35(56.5)  | 27(43.5)  | 3.47(1.99,6.03)  |
| Higher education      | 21(42.9)  | 28(57.1)  | 2.01(1.09,3.69)  |
| Husband's education   |           |           |                  |
| No formal education   | 102(30.4) | 233(69.6) | 1.0              |
| Elementary            | 30(48.4)  | 32(51.6)  | 2.14(1.24,3.71)  |
| Secondary             | 20(35.1)  | 37(64.9)  | 1.24(0.68,2.23)  |
| College/higher        | 55(45.8)  | 65(54.2)  | 1.93(1.26,2.96)  |
| Employment            |           |           |                  |
| House wife            | 180(35.8) | 323(64.2) | 1.0              |
| Employed              | 27(38.0)  | 44(62.0)  | 1.1(0.7, 1.84)   |

**Maternal and obstetric factors associated with institutional delivery care utilization:**

Regarding the women's parity, women who were primipara were 2.08 times more likely to deliver at health institution compared to multiparous (COR=2.08, 95% CI=1.4, 3.0). Women who had antenatal care follow up were 12.82 times more likely to deliver at

health institution than women who had no ANC follow-up (COR=12.82, 95% CI=4.61, 35.61).

Concerning the frequency of ANC visit, women who had 3 and above visit were 3.42 times higher than those who had 1 visit to deliver at health institution (COR =3.42, 95% CI=1.13, 10.35)

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**Table 5:** Bivariate maternal and Obstetric factors of respondents in Ayssaita District, North Eastern, Ethiopia, March 2015.

| Explanatory Variables     | Delivery care utilization |           | COR(95%CI)       |
|---------------------------|---------------------------|-----------|------------------|
|                           | Yes (%)                   | No (%)    |                  |
| <b>Age group of women</b> |                           |           |                  |
| <18                       | 7(33.3)                   | 14(66.7)  | 1.28(0.5,3.34)   |
| 18-29                     | 146(40.4)                 | 215(59.6) | 1.7(1.2, 2.5)    |
| >=30                      | 54(28.1)                  | 138(71.9) | 1                |
| <b>Residence</b>          |                           |           |                  |
| Urban                     | 115(46.2)                 | 134(53.8) | 2.2(1.54,3.1)    |
| Rural                     | 92(28.3 )                 | 233(71.7) | 1                |
| <b>Marital status</b>     |                           |           |                  |
| In marital status         | 204(36.7)                 | 352(63.3) | 2.9(0.83,10.1)   |
| Not in marital status     | 3(16.7)                   | 15(83.3)  | 1                |
| <b>Religion</b>           |                           |           |                  |
| Muslim                    | 184(35.7)                 | 332(64.3) | 1                |
| Orthodox                  | 22(41.5)                  | 31(58.3)  | 1.28(0.72, 2.28) |
| Others                    | 1(20)                     | 4(80)     | 0.45(0.05, 4.06) |
| <b>Ethnicity</b>          |                           |           |                  |
| Afar                      | 86(26.3)                  | 241(73.7) | 1                |
| Amhara                    | 103(48.6)                 | 109(51.4) | 2.65(1.84, 3.81) |
| Others                    | 18(51.4)                  | 17(48.6)  | 2.97(1.46, 6.03) |

In the multivariable analysis, Residence, the age of the mother, marital status women’s educational level, mother’s occupation, educational status of husband, age at first pregnancy, gravidity, parity, awareness to pregnancy danger signs, the frequency of antenatal care visit and ANC visit were interred to multivariable logistic regression analysis. From those entered variables, marital status, women's educational level,

the frequency of ANC visit and educational status of the husband were significantly associated with institutional delivery.

Women who are married were 3.97 times more likely to deliver at health institution than not married AOR= 3.97, 95 % CI = 1.04, 14.7).

Educational level of the women also has a significant association with institutional delivery. Women who had elementary and

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high school educational level were more likely to deliver at health institution than women who had no education (Elementary, AOR= 2.46, 95% CI= 1.39, 4.34. High school, AOR= 2.88, 95 CI= 1.43, 5.81)

Women who attended ANC at least three times were 3.23 times more likely to be delivered at health institution compared to women who attended ANC less than three times (AOR=3.23, 95%CI=1.02, 10.27).

**Table 6:** Factors associated with delivery care utilization among women of reproductive age in Ayssaita district, March 2015.

| Explanatory Variables           | Delivery care utilization |           | COR(95% CI)     | AOR(95% CI)      |
|---------------------------------|---------------------------|-----------|-----------------|------------------|
|                                 | Yes (%)                   | No (%)    |                 |                  |
| Age group of women              |                           |           |                 |                  |
| <18                             | 7(33.3)                   | 14(66.7)  | 1.28(0.5,3.34)  | 6.59(0.68,63.47) |
| 18-29                           | 146(40.4)                 | 215(59.6) | 1.7(1.2, 2.5)   | 1.05(0.64,1.71)  |
| >=30                            | 54(28.1)                  | 138(71.9) | 1               | 1                |
| Residence                       |                           |           |                 |                  |
| Urban                           | 115(46.2)                 | 134(53.8) | 2.2(1.54,3.1)   | 1.00(0.64,1.71)  |
| Rural                           | 92(28.3)                  | 233(71.7) | 1               | 1                |
| Marital status                  |                           |           |                 |                  |
| In marital status               | 204(36.7)                 | 352(63.3) | 2.9(0.83,10.1)  | 3.97(1.07,14.7)  |
| Not in marital status           | 3(16.7)                   | 15(83.3)  | 1               | 1                |
| women's education               |                           |           |                 |                  |
| No education                    | 98(27.2)                  | 262(72.8) | 1               | 1                |
| Elementary                      | 53(51.5)                  | 50(48.5)  | 2.83(1.81,4.45) | 2.46(1.39,4.34)  |
| High school                     | 35(56.5)                  | 27(43.5)  | 3.47(1.99,6.03) | 2.88(1.43,5.81)  |
| Higher education                | 21(42.9)                  | 28(57.1)  | 2.01(1.09,3.69) | 1.57(0.72,3.47)  |
| Husband's education             |                           |           |                 |                  |
| No formal education             | 102(30.4)                 | 233(69.6) | 1.0             | 1                |
| Elementary                      | 30(48.4)                  | 32(51.6)  | 2.14(1.24,3.71) | 1.05(0.56,2.00)  |
| Secondary                       | 20(35.1)                  | 37(64.9)  | 1.24(0.68,2.23) | 0.39(0.19,0.79)  |
| College/higher                  | 55(45.8)                  | 65(54.2)  | 1.93(1.26,2.96) | 0.68(0.38,1.210) |
| Employment                      |                           |           |                 |                  |
| House wife                      | 180(35.8)                 | 323(64.2) | 1.0             | 1                |
| Employed                        | 27(38.0)                  | 44(62.0)  | 1.1(0.7, 1.84)  | 0.58(0.29,1.14)  |
| Parity                          |                           |           |                 |                  |
| Primiparous                     | 75(48.4)                  | 80(51.6)  | 2.08(1.4, 3.0)  | 1.29(0.27,6.27)  |
| multiparaous                    | 132 (31.5)                | 287(68.5) | 1.0             | 1                |
| Age at first pregnancy          |                           |           |                 |                  |
| <18years                        | 82(29.6)                  | 195(70.4) | 1.0             | 1                |
| >=18years                       | 125(42.1)                 | 172(57.9) | 1.73(1.22,2.44) | 0.98(0.63,1.54)  |
| Aware danger signs of pregnancy |                           |           |                 |                  |

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|                  |           |           |                   |                   |
|------------------|-----------|-----------|-------------------|-------------------|
| Yes              | 57(44.9)  | 70(55.1)  | 1.61(1.08, 2.41)  | 1.14(0.72,1.81)   |
| No               | 73(33.8)  | 143(66.2) | 1.0               | 1                 |
| Frequency of ANC |           |           |                   |                   |
| 1                | 4(19)     | 17(81)    | 1.0               | 1.0               |
| 2                | 35(32.7)  | 72(67.3)  | 2.01(0.65,6.60)   | 1.93(0.59,6.34)   |
| ≥3               | 164(44.6) | 204(55.4) | 3.42(1.13, 10.35) | 3.23(1.02, 10.27) |
| Gravidity        |           |           |                   |                   |
| Primigravida     | 71( 48.3) | 76(51.7)  | 1.99(1.36,2.93)   | 0.93(0.19,4.49)   |
| Multigravida     | 136(31.9) | 291(68.1) | 1                 | 1                 |

( $p < 0.05$  is significant )

## Discussion

**Delivery care utilization:** This study finding revealed that about 36.1% of the women were delivered to health institution and also assisted by a skilled health professional during delivery. This finding was higher than the studies conducted in Munesa woreda, Oromiya and Dodota woreda, Oromiya which accounts 12.3% and 18.2 respectively (Abdella Amano et al., 2010, AdissalemFikre and MeazaDemissie, 2012). But the result was lower than a study conducted in Woldia, Ethiopia which was 48.3% of the women gave birth in the health institution in the presence of skilled health provider (Worku Awoke. et al, 2013). This could be due to afar is pastoralists community whose movement place to place may have an effect on delivery service utilization. It is also, higher compared to the mini DHS (2014) in Ethiopia showed that women living in Afar received institutional delivery service with professionally assisted delivery care was about 10% (EDHS,2014). This could be the fact that DHS includes remote areas of afar awareness creation among women about the benefit of skilled attendance at delivery through an expansion of urban health extension workers and Ayssaita have settled population than other Afar districts. And also currently started free ambulance

services in the community that enhance institutional delivery service utilization.

Home delivery is still a cultural practice in Afar people. In this study, about 63.9 % of births had taken place at home. This finding is lower than the study conducted Munisa Woreda and Dodota woreda which is 87.7 % and 81.8% respectively ( Abdella Amano et al., 2010, AdisalemFikre and MeazaDemissie, 2012). But the result is higher than a study done in Woldia woreda which is 51.7% (Worku Awoke. et al, 2013). This might be because of the time gap between the study periods.

**Factors associated with delivery care utilization:** Women with elementary and high school educational status were more likely to utilize institutional delivery when compared to women with no education (AOR= 2.46, 95% CI = 1.39, 4.34 and AOR=2.88, 95%CI=1.43, 5.81).

Results of this study also revealed that use of delivery service and skilled birth attendants were significantly associated with the level of husband and women education. Women who had college/higher educated husbands are more times more likely to use safe delivery services than those with no education levels. Maternal and child health studies conducted in Ethiopia and developing countries agree with these findings (Yvonne, 2010, YaredMekonnen

“Magnitude and associated factors for institutional delivery service among women who gave birth in the last 12 months in Ayssaita district, North East Ethiopia: A community based cross sectional study-2015.” and Asnaketch Mekonnen, 2013; Alemaw Wolelie et al., 2014). This may be the fact that, education is likely to enhance males/women to have a good awareness of modern health care services including institutional delivery services that encourages the women to seek care services.

In this study women who attended antenatal visits at least three times were more likely to seek institutional delivery care than women who attended less than three times. Similar findings were reported in Woldia, Ethiopia (Worku Awoke., 2013). This may be due to the fact that women with more ANC visits also showed a higher satisfaction with the care quality and hence more likely to use health services for delivery. It is also a fact that many ANC visits expose the women to more health education and counseling which are both likely to increase service utilization.

The present study showed that marital status of women has a significant association with utilization of institutional delivery service. Women in marital union were 3.97 times to delivered in a health facility than the reference group (AOR=3.97, 95%CI=1.07, 14.70). Similar findings were reported in DHS analysis done by Yared and Asnaketch (Yared Mekonnen and Asnaketch Mekonnen, 2013).

**The strength of the study:** The major strengths of this study were: community-based including the urban and rural kebeles. Uses of Female gender for the interview as women are more open to the same sex.

**Limitation of the study:** There might be the possibility of recall bias. However, we tried to minimize by focusing on those women who gave birth in the last one year.

### **Conclusion**

This study showed that utilization of institutional delivery services in last 12 months of preceding the survey were

relatively higher in the study from other studies done in Ethiopia but inadequate in general. Majority of women attended at least one antenatal visit from skilled health care providers during their recent pregnancy in the study area, however; less than half of the women received the recommended four antenatal visits by WHO. Only 36.1% deliveries were attended by a skilled health professional in a health facility and the rest were conducted by nonskilled health professionals at home in which majority of these deliveries were still attended mostly by their mothers. Women's and husband's literacy status, marital status and frequency of ANC attendance were predictors of institutional delivery care utilization. Being apparently healthy, distant from a health facility, feeling shame, no female health worker and cultural barrier were the main reasons given by the women for utilization of instructional delivery service.

### **Recommendations**

Based on the finding of this study, the following recommendations were forwarded. The town administration education offices should strengthen access for women education. The health extension workers should create awareness about the importance of institutional delivery regarding the reduction of maternal and neonatal death. Even though there was high coverage of ANC visit, there was low instructional delivery. So the health care providers working in MCH department should counsel the mothers about pregnancy risk and place of delivery. Woreda health office should increase coverage of health institution to decrease distant of the rural kebeles. Religious and ethnic leaders should teach the community about false cultural believes. Further large-scale studies should be conducted to come up with additional findings.

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## References

- Abdella Amano, Abebaw Gebeyehu, and Zelalem Birhanu. 2012. Institutional delivery service utilization in Munisa Woreda, South East Ethiopia: a community-based cross-sectional study. *BMC Pregnancy and Childbirth*; 12:105
- Addis Alem Fikre and Meaza Demissie. 2012. Prevalence of institutional delivery and associated factors in Dodota Woreda, Oromiya regional state, Ethiopia. *Reproductive Health*, 2012; 9: p. 33.
- Adisasmita A, Deviany PE, Nandiaty F, Stanton C, Ronsmans C. 2008. Obstetric near miss and deaths in public and private hospitals in Indonesia. *BMC Pregnancy and Childbirth*.;810. doi:10.1186/1471-2393-8-10.
- Admasu Kebede, Haile-Mariam Abebe, Bailey Piter, 2008. Indicators for availability, utilization, and quality of emergency obstetric care in Ethiopia,. *International Journal Gynecology and Obstetrics* 2011, 115(1):101–105.9
- Alemaw Wolelie, Mekonnen Aychilhum, Worku Awoke. 2014. Institutional delivery service utilization and associated factors in Banja District, Awie Zone, Amhara Regional State, Ethiopia: *Open Journal of Epidemiology* 2014, 4, 30-35
- Antwerp, 2013. 200 Unmet Obstetric Needs Network. [www.uonn.org](http://www.uonn.org). Accessed 2<sup>nd</sup> December.
- Asmeret Moges Mehari. 2013. Levels and Determinants of Use of Institutional Delivery Care Services among Women of Childbearing Age in Ethiopia: Analysis of EDHS 2000 and 2005 Data. ICF International Calverton, Maryland, USA, February 2013.
- Central Statistical Agency [Ethiopia], ICF International: Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia, and Calverton, Maryland, USA: Central Statistical Agency and ICF International; 2012.
- Central Statistical Agency [Ethiopia]. 2014. Ethiopia Mini Demographic and Health Survey 2014. Addis Ababa, Ethiopia.
- Daniel Bogale and Desalegn Markos . 2014. Institutional delivery service utilization and associated factors among childbearing age women in Goba Woreda, Ethiopia; *Journal of Gynecology and Obstetrics*. Vol. 2, No. 4, 2014, pp. 63-70. doi: 10.11648/j.jgo.20140204.14
- Donnay F. 2000. Maternal survival in developing countries: What has been done, what can be achieved in the next decade. *International Journal Gynecology and Obstetrics*, 70:89-97
- Freedman LP, Graham WJ, Brazier E, Smith JM, Ensor T, Fauveau V, Themmen E, Currie S, Agarwal K. 2007. Practical lessons from global safe motherhood initiatives: time for a new focus on implementation. *The Lancet*, 370 (9595):1,383–91.
- Gurmesa Tura, Gedefaw Abeje, and Worku Gebeyehu. 2008. Antenatal care service utilization and associated factors in the metekel zone, North West Ethiopia, *Ethiopia journal of health science*, vol.19 No2
- Hogan MC, Foreman KJ, Naghavi M, Ahn SY, Wang M, Makela SM, Lopez AD, Lozano R, Murray CJL. 2010. "Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5." *The Lancet*. 375(9726): 1609-1623
- ICPD (International Conference on Population and Development). 1994. program of action adopted at the International Conference

- “Magnitude and associated factors for institutional delivery service among women who gave birth in the last 12 months in Ayssaita district, North East Ethiopia: A community based cross sectional study-2015.”  
on Population and Development Cairo5-13 September.
- Kayongo M, Rubardt M, Butera J, Abdullah M, Mboniyinyibuka D, Madili M. 2006. Making EmOC a reality — CARE's experiences in areas of high maternal mortality in Africa. *International Journal of Gynecology and Obstetrics*, 92:308–19.
  - Lawn JE, Lee AC, Kinney M, Sibley L, Carlo WA, Paul VK, Pattinson R, Darmstadt GL. 2009. Two million intrapartum-related stillbirths and neonatal deaths: Where, why, and what can be done? *International Journal of Gynecological and Obstetric*, 109: S5–S19.
  - Mbonyea A.K, Asimweb J.B, Kabarangirac J, Nandad G, Orinda V. 2007. Emergency obstetric care as the priority intervention to reduce maternal mortality in Uganda. *International Journal of Gynecology and Obstetrics*, 96, 220–225
  - Melkamu Fanta. 2006. factors for influencing utilization of maternal health care service in Ayssaita district, Ethiopia, *science journal of public health*, 2006
  - Meseret Girma, Yaliso Yaya, Ewenat Gebrehanna, Yemane Berhane and Bernt Lindtjørn. 2013. Lifesaving emergency obstetric services are inadequate in south-west Ethiopia: a formidable challenge to reducing maternal mortality in Ethiopia. *BMC Health Services Research*, 13:459 <http://www.biomedcentral.com/1472-6963/13/459>
  - Nyamtema AS, Urassa DP, van Roosmalen J. 2011. Maternal health interventions in resource-limited countries. a systematic review of packages, impacts, and factors for change. *BMC Pregnancy Childbirth*, 17:11:30.
  - Olufemi T, Oladapo OT, Sule-Odu AO, Olatunji AP, Daniel OJ. 2005. “Near-miss” obstetric events and maternal deaths in Sagamu, Nigeria: a retrospective study. *Reproductive Health*, 2:9
  - Oyerinde K, Harding Y, Amara P, Garbrah-Aidoo N, Kanu R, et al. 2012. Barriers to Uptake of Emergency Obstetric and Newborn Care Services in Sierra Leone: A Qualitative Study. *Journal Community Medicine Health Education* 2:149. doi:10.4172/2161-0711.1000149
  - Paxton A, Maine D, Freedman D, Fry D, Lobis S. 2005. The evidence for emergency obstetric care. *International Journal of Gynecology and Obstetrics*, 88(2):181-19.
  - Reuben K. Esena, Mary-Margaret Sappor. 2013. Factors Associated With The Utilization Of Skilled Delivery Services In The Ga East Municipality Of Ghana Part 2: Barriers To Skilled Delivery, an international journal of scientific & technology research volume 2, issue 8, August 2013.
  - Samuel Hailu, Fikre Enquesellassie, Yemane Berhane. 2009 Health facility-based maternal death audit in Tigray, Ethiopia. *Ethiopia Journal of Health Development*, 23(2):115–119.
  - Thaddeus S, Maine D. 1994. Too far to walk maternal mortality in context. *Social Science and Medicine*. 1994; 38(8):1091-110.
  - Ugo O, Mohammed J, Muhammad A., Isa S and Nonye A, Charles W. 2012. Prenatal care and basic emergency obstetric care services provided at primary healthcare facilities in rural Nigeria; *International Journal of Gynecology and Obstetrics* 117 (2012) 61–65
  - UNFPA: Emergency Obstetric Care. Providing Emergency Obstetric and

“Magnitude and associated factors for institutional delivery service among women who gave birth in the last 12 months in Ayssaita district, North East Ethiopia: A community based cross sectional study-2015.”

- Newborn Care to All in Need.  
<http://www.unfpa.org/public/mothers/pid/4385>.
- UNICEF, WHO, UNFPA AND STATISTIC SIERRA LEONE. 2008. Sierra Leone EmONC Needs Assessment Survey.
  - United Nations Children’s Fund: Progress for Children. 2008. A report card on maternal mortality, New York: United Nations Children’s Fund (UNICEF).
  - United Nations. 2013. The Millennium Development Goals Report. Retrieved from:<http://mdgs.un.org/unsd/mdg/Resources/Static/Data/2013%20Stat%20Annex.pdf>.
  - United Nations.2010.The Millennium Development Goals. New York: United Nations Report. Unmet Obstetric Needs Network Tackling unmet needs for major obstetric interventions. Case studies in Benin, Burkina Faso, Haiti, Mali, Morocco, Niger, Pakistan, and Tanzania.
  - USAID.2013. Health-Related Research and Development Progress Report an Update of the 2011–2015 Health Research Strategy.
  - WHO (World Health Organization). 2009. Monitoring Emergency Obstetric Care: A Handbook. Geneva: WHO.
  - WHO(World Health Organization). 2008. The proportion of Births Attended by a Skilled Health Worker, 2008 Updates. Geneva: WHO
  - WHO(World Health Organization). 2010. World health statistics. WHO.
  - WHO(World Health Organization).1994. Mother-baby package: implementing safe motherhood in countries. Geneva: Maternal Health and Safe Motherhood Programme, Division of Family Health, WHO; 1994:88.7
  - WHO(World Health Organization).2004. Fifty-Seventh World Health Assembly: Provisional agenda item 12.10 A57/13. In.Geneva: WHO.
  - WHO, ICM, and FIGO.2004.Making Pregnancy Safer: The Critical Role of the Skilled Attendant.A Joint Statement by WHO, ICM, and FIGO. Geneva. World Health Organization.
  - WHO, UNICEF, UNFPA and The World Bank estimates.2012.Trends in maternal mortality: 1990 to 2010. Geneva, Switzerland: World Health Organization.
  - WHO, UNICEF, UNFPA, AMDD. 2009. Monitoring Emergency Obstetric Care, a handbook. WHO publications, Geneva, Switzerland: World Health Organization.
  - WHO.2002 Reducing Risks, Promoting Healthy Life: the world health report.
  - WHO/FRH/MSM/1996.7. Perinatal mortality: a listing of available information,
  - Wilunda C, Putoto G, Manenti F, Castiglioni M, Azzimonti G, Wagari Edessa et al. 2013. Measuring equity in utilization of emergency obstetric care at Wolisso Hospital in Oromiya, Ethiopia: a cross-sectional study. International Journal for Equity in Health, 2013, 12:27.
  - Worku Awoke, Jemal Muhammed, Gedefaw Abeje.2013.Institutional Delivery Service Utilization in Woldia, Ethiopia; Science Journal of Public Health. Vol. 1, No. 1, pp. 18-23. Doi: 10.11648/j.sjph.20130101.13
  - Worku Gebeyehu Abebaw, Yalew Worku Alemayehu, and Afework Fantahun Mesganaw. 2013. Factors affecting utilization of skilled maternal care in Northwest Ethiopia: a multilevel analysis; BMC International Health and Human Rights 2013, 13:20
  - YalemTsegay, Tesfay Gebrehiwot, Isabel Goicolea, Kerstin Edin, Hailemariam Lemma, and Miguel San

- “Magnitude and associated factors for institutional delivery service among women who gave birth in the last 12 months in Ayssaita district, North East Ethiopia: A community based cross sectional study-2015.”
- Sebastian.2013. Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: a cross-sectional study; International Journal for Equity in Health, 12:30  
<http://www.equityhealthj.com/content/12/1/30>
- Yared Mekonnen and Asnakech Mekonnen. 2013.Factors Influencing the Use of Maternal Healthcare Services in Ethiopia Journal of Health Population Nutrition; 21(4):374-382 © 2003 ICDDR, B: Centre for Health and Population Research
  - Yvonne.2010.analysis of Rwandan demographic health survey, an international journal of science and technology research,2010.
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