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Factors associated with utilization of institutional delivery among mothers in the Butajera Health & Demographic Surveillance System, Ethiopia, 2013. A case control Study.

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Abbreviation

AAU: Addis Ababa University

ANC: Antenatal care

AOR: Adjusted odds ratio

CI: confidence interval

COR: Crude Odds Ratio

DSS: Demographic surveillance system

EDHS: Ethiopian Demography and Health Survey

FGD: Focus group discussion

HEW: Health extension workers

ICD: International Classification of Diseases

ID: institutional delivery

IDS: institutional delivery service

IRB: Institutional Review Board

MMR: Maternal Mortality Ratio

NGO: Non-Governmental Organization

SAD: Skilled assisted delivery

SNNPR Southern Nations, Nationalities and People region

TBA: Traditional Birth Attendants

WHO: World Health Organization

Abstract

Background: Maternal mortality is unacceptably high. Most maternal deaths are avoidable, as the health-care solutions to prevent or manage complications are well known. An important component of efforts to reduce health risks to mothers and children is increasing the proportion of babies that are delivered in health facilities. Ethiopia has one of the highest home delivery practices, as the 2011 EDHS report shows home delivery prevalence was 90%. To improve maternal health, barriers that limit utilization and access to delivery services must be identified and addressed.

Objectives: The objective of the study is to asses factors associated with institutional delivery among mothers in the Butajera Demographic and Surveillance System.

Method: A community based case control study supplemented with a qualitative study was conducted to identify factors associated with utilization of institutional delivery. The study was done using the Butajera demographic surveillance system. Women who have given birth in health institution in the past one year was considered as Cases while the controls were women who have given birth at home in the past one year. The quantitative data was collected using a pre-tested and structured questionnaire and four FGDs and four in-depth interviews were done using interview guide. To assess the association, bivariate analysis was done. All independent variables with p-value less than 0.05 were included in the final multivariate logistic regression model.

Result: The final multivariate regression model has shown that the main determinant factors of utilization institutional delivery service are age of mother, residence at the time of delivery, place of previous deliveries, decision maker about place of delivery and history of health problem during last delivery. While being young in age and history of health problem increased utilization of IDS, residing in rural area was found to be preventive of utilization of IDS. In addition both mothers who have all their deliveries in health institution and those who have all their deliveries in their home will follow the same pattern as their previous experience. The qualitative part of this study has shown that mothers are not convinced about the services and the health professionals in health institutions.

Conclusion: In conclusion, mothers in urban areas, who never used IDS and older at age were found less probable to use IDS, hence due attention should be given to this group of women to improve utilization. The government and health professionals should educate mothers and advocate delivery service in order to change the outlook of the community towards IDS.

1. Introduction

1.1. Background

While motherhood is often a positive and fulfilling experience, it is linked to suffering, ill health and even death for too many women[1]. Many die due to birth complications. Maternal mortality is unacceptably high. About 800 women die from pregnancy- or childbirth-related complications around the world every day [2]. In 2011, 273,500 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented[3]. The MMR in developing regions was 15 times higher than in developed regions. Africa has the highest burden of maternal mortality in the world and sub-Saharan Africa is largely responsible for the maternal death figure for that region, contributing approximately 98% of the maternal deaths for the region [4]. In Ethiopia the estimated maternal mortality ratio is 676 per 100,000 live births in the 2011 EDHS, showing no improvement from the 2005 EDHS (673 per 100,000 live births)[5].

It is estimated that nearly two-third of the 8 million infant deaths that occur each year largely from poor maternal health and hygiene, inadequate care, inefficient management of delivery, and lack of essential care of newborn [6]. In Ethiopia infant mortality is estimated to be 59 deaths per 1,000 live births showing a declined by 39 percent over the 15-year period between the 2000 EDHS and the 2011 EDHS, yet much effort is needed to change this figure [5].

Most maternal deaths are avoidable, as the health-care solutions to prevent or manage complications are well known [1]. An important component of efforts to reduce health risks to mothers and children is increasing the proportion of babies that are delivered in health facilities. Research has shown that adequate use of antenatal and delivery services can reduce maternal deaths by between 10 to 45%, especially in the developing countries where maternal mortality is highest[7]. For all pregnant women, utilization of health care services is a key proximate determinant of maternal and infant outcomes, including maternal and infant mortality [8]. Skilled attendance at delivery is an important indicator in monitoring progress towards Millennium Development Goal 5 to reduce the maternal mortality ratio by three quarters between 1990 and 2015[9].

Poverty, gender and other inequalities, a lack of information, weak health systems and cultural barriers are obstacles that need to be overcome if women are to access technical services that can often prevent maternal mortality and morbidity [10, 11]. However in developing countries like Ethiopia home birth is widely practiced. Mothers deliver in unhygienic environment, without skilled birth attendant and live saving medications.

1.2. Statement of the problem

Most obstetric complications occur around the time of delivery and cannot be predicted. Therefore it is important that all pregnant women have access to a skilled attendant, i.e. someone with midwifery skills, who is able to manage a normal delivery and who can recognize and manage obstetric complications, or refer in time if needed. In a country like Ethiopia were resource is limited, it is utterly difficult to provide skilled deliver attendant services at a household level. Rather the focus is providing delivery care at health institution level and encouraging mothers to deliver in the health facilities.

Ethiopia has one of the lowest institutional delivery practices, as the 2011 EDHS report shows only ten percent of births in Ethiopia are delivered at a health facility. The percentage of deliveries in a health facility doubled from 6 percent the 2005 EDHS, while home deliveries facility decreased slightly from 94 percent to the current level of 90 percent. The report has also shown that from all the regions in the country, the most affected region is the Southern Nations, Nationalities and People region. In this region less than 10 percent of pregnant women deliver in health institution[5].

1.3 Rationale of the study

To improve maternal health, barriers that limit utilization and access to quality maternal health services must be identified and addressed. Mothers in Ethiopia still prefer to give birth at home for various reasons resulting in low institutional delivery utilization and this research intends to identify the major factors that are associated with institutional delivery.

There have been many descriptive studies done to assess delivery practice in Ethiopia. But sufficient analytical studies which can help to identify the major determinants of institutional delivery are scarce. And given the fact that mother refuse to practice institutional delivery for various interrelated factors and since we cannot alleviate all this factors, it is mandatory to identify the most associated ones. This analytic study is intended to do just that, to identify the predominant factors that are contributing to the occurrence of low institutional delivery utilization. The research was conducted at the heart of low institutional delivery prevalence, Southern Nations, Nationalities and People region. The research will help care providers and policy makers to redirect their action against the most pertinent factors resulting in the unimproved institutional delivery utilization.

2. Literature Review

2.1. Child birth and its consequences

Childbirth is a central event in the lives of families and in the construction of communities; it should remain so, but it must be made safe as well. Women risk death to give life, but with skilled and responsive care, at and after birth, nearly all fatal outcomes and disabling sequelae can be averted – the tragedy of obstetric fistulas, for example – and much of the suffering can be eased[12]. It is important that mothers deliver their babies in an appropriate setting, where lifesaving equipment and hygienic conditions can also help reduce the risk of complications that may cause death or illness to mother and child[10] .

All pregnant women face some level of maternal risk. According to WHO (2000), about 40% of pregnant women experienced delivery complications, while about 15% needed obstetric care to manage complications which are potentially life threatening to the mother or infant[12]. Risks of mortality for women and their babies are highest at the time of birth [13, 14]. Women may suffer extreme pain, bleeding, protracted labour due to the position of the baby and/or the narrowness of the birth canal, physical damage and other birth complications some of which lead to death [15].

Globally, an estimated 287 000 maternal deaths occurred in 2010, a decline of 47% from levels in 1990. Sub-Saharan Africa (56%) and Southern Asia (29%) accounted for 85% of the global burden (245 000 maternal deaths) in 2010. Millions of other women have been left with crippling injuries or illnesses as a result of poor care in childbirth. One of the most common birth-canal injuries, fistula, leaves many women so incontinent that they are ostracized by their families and villages [13]. For every woman who dies in childbirth or pregnancy, another 20 are left with illnesses and injuries that can be debilitating for life [14]. For every 1,000 live births in Ethiopia during the seven years preceding the 2011 EDHS, about seven women died during pregnancy, during childbirth, or within two months of childbirth. The lifetime risk of maternal death indicates that about 4 percent of women died during pregnancy, during childbirth, or within two months of child birth[5].

Lack of skilled attendance could be considered as one of the major factors in maternal and infantile mortality [16]. In the world, one third of births take place at home without the

assistance of a skilled attendant [17]. In the poorer countries of Africa and South Asia, the vast majority of women give birth at home, often lacking basic hygiene, because they cannot afford to travel to a hospital or clinic [18]. While levels of antenatal care have increased in many parts of the world during the past decade, only 46% of women in low-income countries benefit from skilled care during childbirth. This means that millions of births are not assisted by a midwife, a doctor or a trained nurse [19]. According to a study done in southern Ethiopia, a large proportion 87.9% of women reported that they intended to give birth in their home, and only 8% planned to deliver in health facilities [20]. Another study conducted in north west Ethiopia reported only 13.5% of all the mothers gave birth in health facilities; whereas, only 1.7% of the women in rural areas delivered in health facilities[21].

For optimum safety, every woman, without exception, needs professional skilled care when giving birth, in an appropriate environment that is close to where she lives and respects her birthing culture. Such care can best be provided by a registered midwife or a health worker with midwifery skills, in decentralized, first-level facilities. This can avert, contain or solve many of the life-threatening problems that may arise during child birth, and reduce maternal mortality to surprisingly low levels[12]. Nowadays mothers in developed countries are having a planned home delivery which is different from unplanned home delivery in developing countries. Planned home deliveries are the ones which are attended by skilled birth attendant in the homes of a mother and have been found to have certain advantages.

Improving maternal health is one of the eight Millennium Development Goals (MDGs) adopted by the international community in 2000. Under MDG5, countries committed to reducing maternal mortality by three quarters between 1990 and 2015 [9]. However, between 1990 and 2010, the global maternal mortality ratio (i.e. the number of maternal deaths per 100,000 live births) declined by only 3.1% per year. This is far from the annual decline of 5.5% required to achieve MDG5 [6, 18]. Most maternal deaths are easily preventable when basic care is available. Some industrialized countries halved their maternal mortality ratio in the late 19th century, primarily through professional midwifery care at birth[22]. In fact, maternal deaths have been virtually eliminated in Canada and other wealthy countries. But the gap between rich and poor countries is shockingly wide. In Canada, the lifetime risk of maternal death is just one in 11,000. In Angola and Liberia, the risk is one in 12. And in Niger - the worst in the world - the lifetime risk of maternal death is one in seven. In Ethiopia, the risk is one in 27[1].

2.2. Factors associated with utilization of institutional delivery.

A large number of studies on determinants of place delivery have investigated a plethora of potential influential factors. Factors like Socio-demographic characteristics, Socio-economic conditions, past obstetric histories and awareness and attitudes towards delivery services are known to affect mother's choice of place of delivery.

2.2.1. Sociodemographic factors

Studies in developing countries have shown that the decision to deliver in an institution or at home is related to socio-demographic and economic factors such as income, place of residence, educational status, marital status, husband's occupation and educational status [23]. In sub-Saharan Africa, women must overcome numerous barriers when they need modern healthcare [24]. According to the 2011 EDHS, the most important barrier to access to health services that women mention is taking transport to a facility (71 percent), followed by lack of money (68 percent) and distance to a health facility (66 percent)[5].

Distance can be a major obstacle to obtain delivery care, and distance can discourage people from even trying to reach care [6]. In India households living 31 kms or more from the nearest hospital, the predicted probability of an institutional delivery is about 10%. In households with good access (<6 kms), the probability rises to 21 % [10].

A study in Ethiopia revealed that the utilization of IDS was significantly associated with the place of residence. The likelihood of giving birth in the health institutions among urban mothers were more than 11 times higher as compared to rural mothers (AOR=11.51, 95% CI:3.12, 42.41).This might be due to the fact that rural women have less access to the health facilities and lack of awareness and information [25]. In addition if health facilities are not in close proximity or in walking distance, rural mothers are less likely to afford transportation cost. In many instances even if they can afford to pay the transportation fare, the vehicle may not be available at the time they need it[26].

Home birth is most common among the poor [18]. The total actual cost of obtaining delivery care is also another important obstacle as it involves the opportunity costs of time, the cost of transportation, cost of drugs and the cost of supplies [22]. In South Asia and Southeast Asia, 74.7–89.9% of women in the lowest two wealth quintiles reported giving birth at home [18]. According to a study done in Nepal, 'Financial problems at home' and 'worries about cost of care

in the hospital' were mentioned as the reasons for delivering at home [27]. A study in Ethiopia also showed that likelihood of giving birth in the health institutions among respondents whose average monthly income was greater than 1000 birr were two times more than those respondents with monthly income of less than 500 birr (OR=2.09, 95% CI: 0.75, 5.75) [25].

According to a study in Mumbai, home deliveries are not evenly distributed and that they cluster with other markers of vulnerability including lack of education [28]. A study in Ethiopia showed that the likelihood of giving birth in the health institution among mothers who completed grade 9 or above were more than 4 times higher as compared to non-educated respondents (AOR=4.44, 95% CI: 1.09,18.16) [25]. In studies done in Kenya, south west Ethiopia, Nigeria and Thailand it was a significant predictor of institutional delivery service [17, 23, 29, 30].

2.2.2. Awareness and attitude of mothers

Awareness and attitude of both mothers and husbands towards delivery services is another factor known to affect choice of place of delivery. Mothers who were not informed about place of delivery were less likely to utilize institutional delivery service than informed ones[31]. Mother's perception on birth attendants at home versus at health facility were also found to be predictive of delivery practice [32]. Lack of biomedical understanding of the risks of obstetric emergency influences women's decision to remain at home to give birth. This view of birth as a natural, easy process is challenging for health care professionals to address because it is a fundamentally different conceptualization of childbirth [33]. Furthermore the perceived quality of care is another factor affecting the decision to seek care. Poor-quality services deter people from traveling to a facility because experience has taught them that supplies will be out of stock, or that they will be poorly treated [34].

Women's decision making power has a significant association with the utilization of service in that those women who were decision maker in their house utilized the service 8 times more likely than the others OR= 7.8, 95%CI; (2.3, 26.5)[18].

Another important determinant of place of delivery may be preference of mothers. According to a study in north west Ethiopia, majority (77.6%) preferred to deliver at home, (18.9%) preferred to give birth in health facilities with the assistance of skilled professionals, and 3.5% of the mothers preferred to deliver in their mother's home[35].

The male decision in maternal health is crucial to permitting women to go to health facilities as well as providing money for treatment [24]. Husbands' attitude towards institutional delivery was also associated with utilization of safe delivery service. Women whose husbands' attitudes were negative were less likely to utilize the service OR= 0.11, 95%CI; (0.02, 0.58)[18]. Another study also showed husbands preferred their wife to deliver at their own home[35].

2.2.3. Obstetric history of mothers

Past obstetric history like the birth order, number of pregnancies, the use of prenatal care, and duration of labour were found to affect the utilization of institutional delivery services provided by skilled delivery attendants [29]. Maternal health studies indicated that the use of prenatal follow-up is positively associated with the utilization of institutional delivery service [36, 37]. In a study done in Ethiopia the likelihood of giving birth in the health institutions among users of ANC were three times higher as compared to non-users of ANC follow-up(AOR=2.80, 95% CI: 1.27, 6.17)[25].

Order of pregnancy has also showed a statistical association with the utilization of safe delivery. Those women who have five and more children were less likely to utilize the service than those who have one child (OR (95%CI): .18, (.08, .42))[29]. A study on patterns of maternal health care utilization has also shown increase in parity decreases the chance of using delivery care[38]. Age at first pregnancy has showed statistical association with place of delivery. Those who were pregnant before the age of 20 years were less likely to utilize the service than those who were pregnant after the age of 20years (OR (95%CI): .60, (.38, .95)) [18]. Other studies done in Kenya and Indonesia have also shown that younger women are more likely to utilize delivery services since they are more prone to complications than older women[7, 39].

Another strong factor for utilization of health care for delivery is the length of previous labour. As the length of labour prolonged in the previous delivery the woman prefers to deliver in health institution, the same is true when a woman had other difficulties in the previous labours[26]. The poor utilization of delivery has often been attributable to the unpredictable onset of labor, making it difficult for women to travel long distances as well as some factors associated with cost of delivery of care [36]. In a study done in Burkina Faso, Women explained that in most of the time by the fact that the labour was too fast and they did not have time to reach a health facility [16].

3. Objective

3.1. General Objective

- To asses factors associated with institutional delivery among mothers in the Butajera Demographic Surveillance System.

3.2. Specific Objectives

- To determine sociodemographic factors associated with institutional delivery.
- To asses awareness and attitudes towards delivery services that are associated with institutional delivery.
- To identify obstetric factors associated with institutional delivery.

4. Methodology

4.1. Study area

The study was conducted in Butajera area which is located in Guraghe and Silti zones of Southern Nations, Nationalities and People region (SNNPR) of Ethiopia. The area is located 130 km south of the central city Addis Ababa. Nine rural and one urban area were under follow up for over 25 years in Butajira by the Butajera health &demographic surveillance system [40].

The Butajera health & demographic surveillance system area covers a sample within the District following ten communities initially sampled from the entire District. Residents of the study region varied in type of residential ecology, social, cultural, environmental, reproductive health and economic characteristics. Two-thirds of the people follow the Islamic religion, with Orthodox Christianity as the second dominant religion in the area. The major language is Guragigna with variations among different tribal groups. Amharic, the national language, is widely spoken in the area, and is also an important written language. The main occupations are farming in rural areas and small-scale business in town. About 77% of the population is illiterate. Illiteracy is greater among the rural population and females. Starting in 2002Gc, a public hospital staffed by general practitioners, a gynecologists and a surgeon provides services to the district. In addition, private and NGO health institutions, including one hospital, serve the population.

The Butajera health & demographic surveillance system records vital events and migration at the household level after an initial baseline census in 1987, using village-based data collectors. The surveillance system works as an open cohort people may enter and leave the area at any time. Birth was recorded quarterly including information like place of delivery and the respective residence of the mother.

4.2. Study design

A community based case control study was conducted to identify factors associated with institutional delivery supplemented with a qualitative study. The study was done using the Butajera health & demographic surveillance system.

4.3. Study period

The study was conducted from December 2012 to January 2013.

4.4. Source Population

All women who have given birth and under follow up in the Butajera demographic surveillance system.

4.5. Study Subjects

All women who have given birth in the past one year period and recorded in the Butajera DSS.

Cases: women who have given birth in health institution in the past one year.

Controls: women who have given birth at home in the past one year.

4.5.1.Inclusion Criteria:

- Women who gave birth within the past one year before the study irrespective of the place and outcome of delivery
- Women who were under follow up in the Butajera DSS

4.5.2. Exclusion Criteria:

- Women who has a psychiatric problem or who is seriously ill at the time of data collection.

4.6. Sampling procedures

4.6.1. Sampling procedures for quantitative data collection

Both cases and controls were selected from the community and multistage sampling method was applied. Six Kebeles, 5 rural (Bido, Dobena, Yeteker, Wrib & Hopae) and 1 urban (K04), were randomly selected from the total ten Kebeles. Study population for cases and controls were identified by reviewing the data from the Butajera DSS records. List of mothers' in the selected kebeles who delivered in the past one year obtained from the record and was used as a sampling frame separately for cases and controls. Then simple random sampling was employed to select the cases and controls.

4.6.2. Sampling procedures for qualitative data collection

Qualitative data collection was done among mothers, fathers, health extension workers and community leaders in the above selected five rural kebeles. Mothers who were included in the quantitative data collection didn't participate in the FGDs. Study participants were purposively selected and each of the four FGD had 7-9 discussants. The in-depth interviews were done with two health extension workers and two community leaders from the rural kebeles.

4.7. Sample size determination

Sample size was determined using two-population proportion formula, taking type one error to be 5%, and 80 % power. Husband's negative attitude towards ID use was chosen as a main exposure variable since it gave maximum sample size.

$$n_1 = \frac{\left[z_{\alpha/2}\sqrt{(r+1)\bar{p}\bar{q}} + z_{1-\beta}\sqrt{rp_1q_1 + p_2q_2} \right]^2}{r(p_1 - p_2)^2}, \quad n_2 = r \times n_1$$

Where,

- n_1= number of mothers who have given birth at health institution in the past one year (cases)
- n_2= number of mothers who have given birth at home in the past one year (controls)
- r= the ratio of cases to controls =3
- $\bar{p} = \frac{p_1 + r \times p_2}{r+1}$; $\bar{q} = 1 - \bar{p}$
- P_1= proportion husband's with negative attitude towards ID among cases (1.29%)[29].
- P_2= proportion husband's with negative attitude towards ID among controls (15%)[29].
- $Z_{\alpha/2}$= Critical value at 95 % level of significance
- $Z_{1-\beta}$= standard normal distribution value corresponding to power (80%)
- A design effect of two was also considered

Accordingly the minimum sample size was 456 (114 cases and 342 controls). Adding 10% for possible non response rate and another additional 5% due to the high migration in one of the kebeles a sample size of 131 cases and 376 controls were involved in the study.

4.8. Data Collection procedures

4.8.1. Quantitative date collection methods

Before beginning the data collection procedure, the study subjects were identified from the record of the Butajra DSS. The record also provided all the information needed to locate the study subjects. The data was collected by trained data collectors using an interviewer administered pre-tested structured questionnaire to address the necessary information. The questionnaire was developed in English and then translated into Amharic. To check for its

consistency, the questionnaire was back translated into English by other people who have the experience of similar work. The data collectors were highly experienced data collectors in the Butajera DSS. The principal investigator supervised the data collection process by checking completeness of the required type of data and correcting for errors.

4.8.2. Qualitative date collection methods

Semi structured interview guide was used for qualitative part data collection. During interview, tape recording and note taking was done by the principal investigator and the data collector of each kebele. Two female FGDs, two male FGDs, two in-depth interviews with HEW and two in-depth interviews with community leaders were done.

4.9. Data Analysis

The quantitative data entry was done using Epi info version 3.5.1 and exported in to SPSS. Then data was cleaned for inconsistencies and missing value and analyzed using SPSS version 17.0-statisticalsoftware.

To assess the association between the different factors and place of delivery, bivariate analysis was done. Three models were constructed for each category of predictors before a final model was built. All independent variables with p-value less than 0.2 in the bivariate analyses were including in the three models. Then variables with p- value less than 0.05 were used to fit the final multivariate logistic regression model. Since the number of significant predictors in the three modes were too many, those variables with P<0.2 in each of the three multivariate model are not considered in the final model, not to build an over saturated model. The unadjusted and adjusted Odds ratios together with their 95% confidence intervals were computed.

Coding and categorizing of the qualitative data was done using open code version 3.6B1. Codes were given line by line and then related codes were categorized. Finally two themes were constructed based on the findings.

4.10. Data quality management

Pre- test was carried out before the start of the data collection to make further adjustments so that the tool would be reliable enough. Also training was given to the data collectors to familiarize them with the questionnaire. At the time of data collection data was checked for completeness and consistency by the principal investigator. Appropriately completed questionnaires were

coded. After wards data cleanup was performed by running frequencies of each variable to check for accuracy, outliers, and consistencies.

4.11. Study Variables

❖ Dependent Variable

- Place of Delivery
- Home delivery
- Institutional delivery

❖ Independent variable

- Socio-demographic variables
- Awareness and attitudes towards delivery services.
- Obstetric histories

4.12. Operational Definitions

- Home birth or home delivery is delivery that has occurred outside any level of health institution irrespective of the delivery attendant.
- Institutional delivery is delivery that has occurred in health institutions irrespective of the level of the facility.
- Planned home birth is delivery occurring at home assisted by skilled delivery attendant within a system that provides for hospitalization when necessary.
- Maternal mortality: Deaths of women during pregnancy, labour, childbirth and within 42days after termination of pregnancy, irrespective of the site and duration of pregnancy from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.(WHO defiition)(34).
- Skilled assisted delivery (SAD) services: are delivery services provided by people skill (Nurses, Midwives, Health Officers, General practitioners, Gynecologists and Obstetricians) to manage normal deliveries, and diagnose, manage or refer obstetric complications.
- Traditional Birth Attendants (TBAs): Are untrained traditional birth attendants who have not received any form of medical training but initially acquires the ability to assist labouring mother at home.
- Permanent resident is mother who has stayed in the 10 kebeles under follow up for at list one year.

- History of death of a newborn is history of stillbirth, death of a neonate or an infant.

4.13. Ethical Consideration

The proposal was submitted to the School of Public Health Research and Ethics Committee, College of health Sciences of Addis Ababa University for approval. Following the approval, Official letter of co-operation was written to concerned bodies by the School of Public Health AAU. Informed consent explaining the nature of the study was obtained from each study participants immediately before the interview. No personal identifiers were used on data collection form. The recorded data was not accessed by a third person except the principal investigator, and was kept confidentially and anonymous. The study participants were not subjected to any harm using the findings of this study.

4.14. Dissemination of Study Results

Findings of this paper will be communicated to school of public health through hard copy and presentation. Attempts will be made to publish the findings of this paper to access others outside as well.

5. Result

A total of 465 women were interviewed resulting in an overall response rate of 91.7%. Among those interviewed 124 were those who delivered in health institution (cases) and 341 were those who delivered at home (controls) giving a response rate of 94.6% for cases and 90.7% for controls. The in-depth interview and the FGD were analyzed and 2 themes were formed (Views about delivery service & Barriers related to service in health institution). Each theme has different categories and the contents of each category are discussed in between the related quantitative findings.

5.1. Sociodemographic characteristics of mothers who have given birth in the past one year in Butajera DSS, 2013.

The mean age of cases was found to be 27.6(SD = ±6.7) and for controls it was 29.8 (SD= ±5.9). In both study groups more than 99% of women were married and more than 75% were Muslim. Regarding educational status, 71.3% of mothers and 51.2% of husbands in the control group and 32.3% of mothers and 25.2% of husbands among cases had no education. In both study groups high proportion of the mothers was housewives and the husbands were farmers. Majority of the study participants in the control group (90%) and 25.8% of the cases were residing in rural area at the time of delivery of their last child. Hence 74.5% of the controls and 54.8% of cases travel on foot to reach the nearby health institution. The mean time taken to reach to the nearby health institution on foot was estimated to be 45.2 minutes (SD = ±35.1) for controls and 39.1 minutes (SD = ±25.4) for cases. The median household expenditure for controls was found to be 620 birr (IQR= 300 birr) and 800 birr (IQR= 400 birr) for cases. See table 1 which shows the different sociodemographic variable distribution in cases and controls.

Table 1: Sociodemographic characteristics of mothers who have given birth in the past one year in Butajera DSS, 2013.

Variables	Study subject		Total n (%)
	Cases n (%)	Control n (%)	
Age at interview			
15-19	4 (3.2)	5 (1.5)	9 (1.9)
20-34	101 (81.5)	243 (71.3)	344 (74)
>35	19 (15.4)	93 (27.3)	112 (24.1)
Ethnicity			
Silti	22 (17.7)	100 (29.3)	122 (26.2)
Gurage & Mareko	97 (78.2)	209 (61.3)	306 (65.8)
Others[1]	5 (4.1)	32 (9.4)	37 (8)
Husband education status			
Secondary school & above	29 (23.6)	11 (3.3)	40 (8.7)
Primary school	63 (51.2)	154 (45.6)	217 (47.1)
No education	31 (25.2)	173 (51.2)	204 (44.3)
Husband occupation			
Farmer	35 (28.5)	277 (82)	312 (67.7)
Merchant	28 (22.8)	29 (8.6)	57 (12.4)
Government employee	60 (48.8)	32 (9.5)	92 (20)
Mother educational status			
Secondary school & above	21 (16.9)	4 (1.2)	25 (5.4)
Primary school	63 (50.8)	94 (27.6)	157 (33.8)
No education	40 (32.3)	243 (71.3)	283 (60.9)
Mother occupation			
Housewife	83 (66.9)	300 (88)	383(82.4)
Merchant	28 (22.6)	34 (10)	62(13.3)
Government employee	8 (6.5)	1 (0.3)	9(1.9)
Others[2]	5 (4)[1]	6 (1.8)	11(2.4)
Residence			
Urban	92 (74.2)	34 (10)	126 (27.1)
Rural	32 (25.8)	307 (90)	339 (72.9)
Time spent to reach to health institution			
≤ 30 min	82 (66.1)	170 (50)	252 (54.3)
> 30 min	42 (33.9)	170 (50)	212 (45.7)
Media use			
Yes	100 (80.6)	246 (72.1)	346 (74.4)
No	24 (19.4)	95 (27.9)	119 (25.6)

[1] Amhara, Oromo,Kontoma, [2] Private employee, Student

Concerning media use 80.6% of cases and 72.1% of controls claim to use media services. As shown in figure 1, among the media sources, radio was the most commonly used in both study groups.

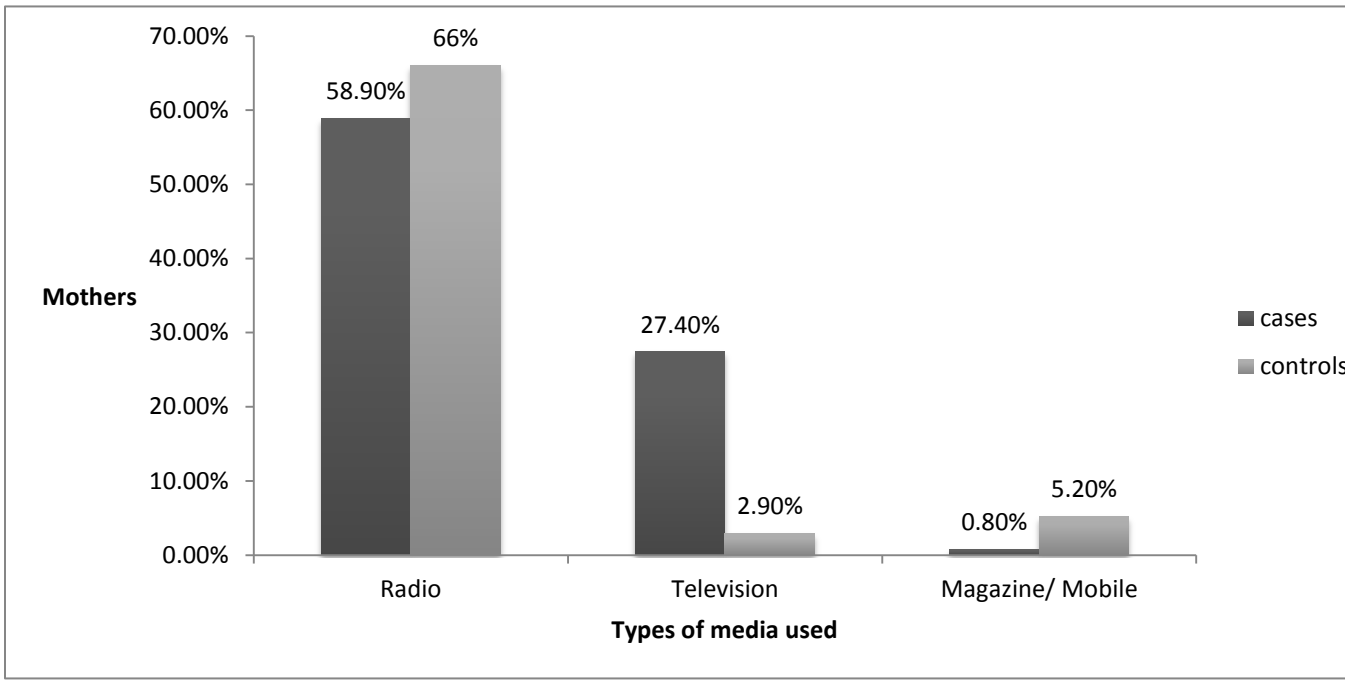

Figure 1. Types of medias used by mothers who have given birth in the past one year in Butajera DSS, 2013

5.2. Awareness and Attitude of mothers who have given birth in the past one year in Butajera DSS, 2013.

More proportion of cases (98.4%) than controls (90.9%) claim to know the presence of delivery services in their nearby health institution. Even though this is the case, 12.9% of controls feel that it is not necessary to use delivery service provided in health institution compared to 1.6% of cases. More proportion of cases than controls have husbands, neighbors and family who feel that it is necessary to use delivery services. The percentage of mothers who think that all mothers should not deliver in health institution, claiming that there are certain conditions to deliver in health institution is four times higher in controls compared to cases. Among the condition to deliver in health institution 31.1% of controls and 3.2% of cases mentioned mothers with long labour. Substantial number of controls (57.5%) and 8.1% of cases prefer to deliver at home. Moreover, 91.8% of controls and 58.9% of cases prefer their delivery attendant to be a female.
Mothers believed that it is only fair for mothers to deliver at home unless and otherwise they face a problem throughout the labouring process and when it is beyond the capacity of TBA. On the contrary in both of the kebeles the men are well aware of the presence of the delivery service and acknowledged the advantages of using the service.
"Why do mothers go to health institution if they don't have any problem during labour. Why would i go to the health post or the hospital, since i have a very short and smooth labour." A 26 years old mother.
"We just want mothers to deliver with clean materials, minimize their bleeding and minimize transmission of HIV by using clean scissors to cut the cord. The baby will not be exposed to the cold and the baby will be clean and hold with clean cloth. " A 50 years old father

Regarding cost of delivery service, 40.8% of controls and 27.4% of cases believe that the cost of delivery service is expensive. Similarly, 37.8% of controls and 25% of cases felt that the transportation cost to reach a health institution is expensive.
The respondents in both female and male FGD have mentioned to be informed by the HEW about the fact that there is no cost for institutional delivery service but they don't feel this is the case. They claim to be charged for most of the service after they go to the health institution.

"Is there really free medication, there is not. There is cost for bed and there is no delivery without payment. Mothers may not immediately deliver so she might stay for 2 to 3 days so when she stays that long it will be expensive." A 35 years old father.

The in-depth interview with the health extension workers also reveled that though they are told to educate mothers about the free delivery service in health institution they are often challenged by mothers about the reality of it.

"We tell mothers that the delivery service is free but after going there they say they spend up to 300 birr which they feel is expensive. So this should be cleared if we say there is no charge for the service." Health Extension worker in one of the Rural kebeles.

In the quantitative part of this study, one third of the study participant in the control group (33.1%) compared to 5.6% of cases said that there is no risk in giving birth at home. But 14.4% of controls and 5.6% of cases claim that there is a risk in giving birth in health institution.

The female respondents stressed the fact that they are terrified about the techniques used to deliver a baby in health institution. There is fear of operation and getting a sutured in the wrong place and this was also mentioned by male respondents.

"Most of the time they do operation quickly without waiting for the mother to deliver spontaneously, so mothers are afraid of that. They do operation on us which will result us in not being able to work. Once they suture us in the wrong place there will always be a problem whenever we are pregnant" A 25 years old mother.

When mothers deliver at home they will be surrounded by a crowd of family and neighbors which helps and comforts them during labour. Not having this support system in the hospital is of the common reason for not using IDS.

"Mothers say that if they deliver in health institution they will have to labour alone but at home the whole neighbors will be with them. They say here they will be surrounded by many friends and family but in health institution all people will be told to get out by the health professionals." HEW in one of the rural kebeles.

Table 2: Awareness and attitude of mothers who have given birth in the past one year in Butajera DSS, 2013

Variables	Study subject		Total n(%)
	Cases n(%)	Controls n(%)	
Aware of presence of IDS			
Yes	122 (98.4)	310 (90.9)	432 (92.9)
No	2 (1.6)	31 (9.1)	33 (7.1)
Necessary to use delivery service			
Yes	122(98.4)	297 (87.1)	419 (90.1)
No	2 (1.6)	44 (12.9)	46 (9.9)
All mother should use delivery service			
Yes	118 (95.2)	216 (63.3)	334 (71.8)
No	6 (4.8)	125 (36.7)	131 (28.2)
Husband feel it is necessary to use IDS			
Yes	116 (94.3)	268 (79.3)	384 (83.3)
No	2 (1.6)	31 (9.2)	33 (7.2)
I don't know	5 (4.1)	39 (11.5)	44 (9.5)
Neighbors feel it is necesary to use IDS			
Yes	101 (81.5)	229 (67.2)	330(71)
No	2 (1.6)	26 (7.6)	28(6)
I don't know	21 (16.9)	86 (25.2)	107(23)
Place preferred to give birth			
Home	10 (8.1)	196 (57.5)	206 (44.3)
Health institution	114 (91.9)	145 (42.5)	259 (55.7)
Risk in IDS			
Yes	7 (5.6)	49 (14.4)	56 (12)
No	117 (94.4)	292 (85.6)	409 (88)
Risk in giving birth at home			
Yes	117 (94.4)	228 (66.9)	345 (74.2)
No	7 (5.6)	113 (33.1)	120 (25.8)
Perceived cost of delivery service			
Expensive	34 (27.4)	139 (40.8)	173 (37.2)
Cheap	88 (71)	141 (41.3)	229 (49.2)
I don't know	2 (1.6)	61 (17.9)	63 (13.5)
Perceived cost of transportation			
Expensive	31 (25)	129 (37.8)	160 (34.4)
Cheap	90 (72.6)	159 (46.6)	249 (53.5)
I don't know	3 (2.4)	53 (15.5)	56 (12)
Attitude towards health professionals			
Good	101 (81.5)	249 (73)	350 (75.3)
Medium	16 (12.9)	31 (9.1)	47 (10.1)
Bad	5 (4)	10 (2.9)	15 (3.2)
I don't know	2 (1.6)	51 (15)	53 (11.4)
Preferred birth attendant's sex			
Male	22 (17.7)	12 (3.5)	34 (7.3)
Female	73 (58.9)	313 (91.8)	386 (83)
Either one	29 (23.4)	16 (4.7)	45 (9.7)

Majority of cases when compared to controls prefer to be attended by health professional where as less number of case when compared to controls prefer to be attended by TBA or neighbors.

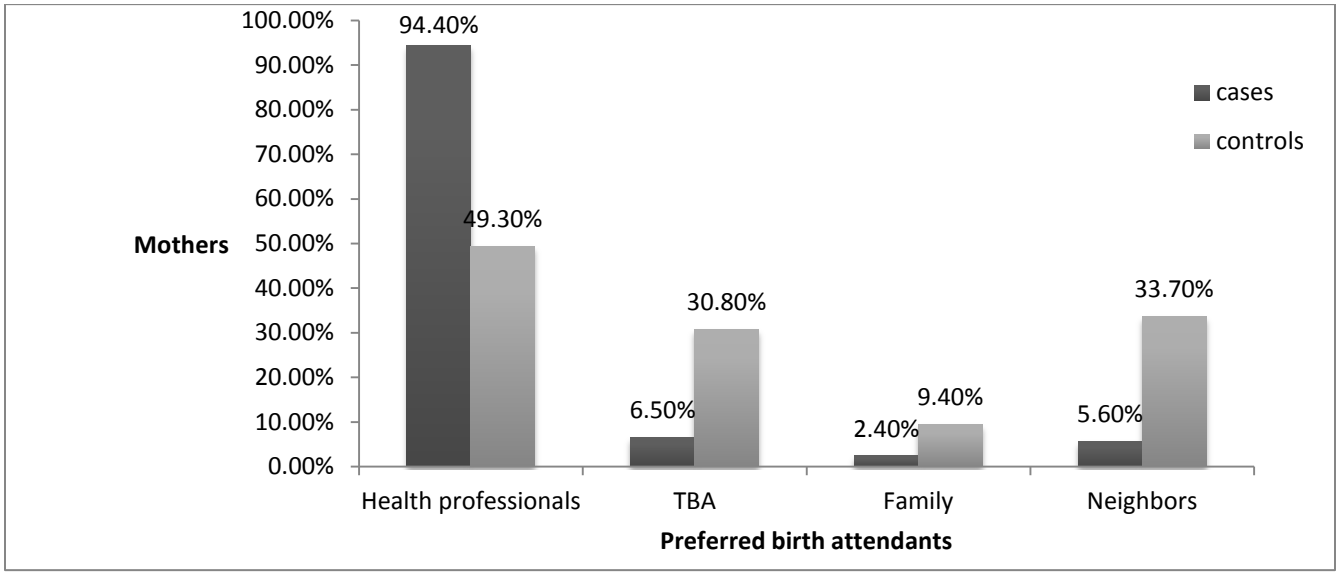

Figure 2. Preferred birth attendants by mothers who have given birth in the past one year in Butajera DSS, 2013.

Not showing enough care, inadequate follow up and being surrounded by practicing students were raised by mothers to cause discomfort, shame and doubts in the service providers. In addition the community leaders rose that the community don't believe the HEWs and the health professionals in rural health centers are qualified enough to manage laboring mother.

"In the hospital they just leave us on a bed, tell us to labour or to do sport. They don't get close to us to understand our problem; they just put a bucket and tell us to push. They say we will deliver when it is time." 28 years old mother.

TBA's are considered to be very advantageous by the respondents in the FGD and the community leaders as well. The respondents claimed that TBA are available and can come to a mother's house at any time of the day. In addition they are of a low cost, very caring and experienced enough to handle mothers in labour.

"Traditional healer don't suture us, they have their own techniques to deliver a baby. The TBA immediately cleans the baby and waits for the placenta. She gives good care for the baby and for the mother. The TBA will save our money and we will avoid the operation." A 27 years old mother.

Even though mothers in the FGD praised TBAs in their neighborhood, the HEW said that TBAs are the ones to blame for the low utilization IDS. It was mentioned that the TBAs encourages mother to deliver at home.

"The TBA will assist the mother at home, they are the ones preventing mothers from coming and who are spreading the problem. We told mothers to come to health institution when they are pregnant at list to have a checkup but it didn't work. The TBA will destruct the community from coming here. They will benefit a great deal from this." HEW in one of the rural kebeles.

5.3. Obstetric history of mothers who have given birth in the past one year in Butajera DSS, 2013.

Majority of mothers in both of the study groups have two to four children. Moreover in 49.6% of controls and 21% of cases, the birth order of last child is greater than five. Majority of controls, 79.3% delivered their previous children at home but it was only 13.5% of the cases. Interestingly so, more cases (28.1%) than controls (23.3%) had pregnancy related health problems in their previous deliveries. In relief of their health problem during their previous delivery, 12.5% of the controls and 4% of the cases went to traditional birth attendants. In addition 44.3% of cases and 26.6% of controls have a history of death of new born.

It was found that the mean age of mothers at the time of their last delivery was 29.4(SD =±5.89) for controls and 27.2 (SD =±6.52) for cases. Around 30.6% of cases and 12% of controls had pregnancy related health problems on their last delivery. But majority of both cases (75.8%) and controls (85.3%) had less than 12 hour long duration of labour. Among those who had health problem during their last delivery all of the cases and 51.2% of controls went to health institution.

Regarding ANC service utilization in previous pregnancies, 78.3% of controls and 95.5% of cases had ANC follow up. Similar figure is found on utilization of ANC service on the last pregnancy but only 41.4% of the controls and 63.2% of cases had four or more visits during their ANC follow-up. In addition 19% of controls and 11.1% of cases said that they were not told where to give birth during their follow up.

According to the qualitative part of this study, both male and female respondents feel that using ANC services makes a mother healthy and normal enough to give birth at home. On the in-depth interview with HEW, it was mentioned that majority of the mothers come for ANC and immunization but miss the delivery service.

"If they have a follow up, it is ok to deliver at home there will be no problem during delivery. If a mothers have follow up she won't even need TBA, she can deliver by herself and she don't need any one." Community leader in Bido

See table 3 which shows the different obstetric history related variables distribution among cases and controls.

Table 3: Obstetric history of mothers who have given birth in the past one year in Butajera DSS, 2013

Variable	Study subject		Total n(%)
	Cases n(%)	Controls n(%)	
Parity			
0-1	38(30.6)	39 (11.4)	77(16.6)
2-4	63(50.8)	161 (47.2)	224(48.2)
Greater than 5	23(18.5)	141(41.3)	164(35.3)
Birth order			
1	35 (28.2)	32 (9.4)	67 (14.4)
2-4	63 (50.8)	140 (41.1)	203 (43.7)
Greater than 5	26 (21)	169 (49.6)	195 (41.9)
Place of delivery of previous children			
All home	12 (13.5)	245(79.3)	257 (64.6)
All health institution	41 (46.1)	5 (1.6)	46 (11.6)
Some home & some ID	36 (40.4)	59 (19.1)	95 (23.9)
History of death of a newborn			
Yes	151 (44.3)	33 (26.6)	184 (39.6)
No	190 (55.7)	91 (73.4)	281 (60.4)
ANC on previous pregnancy			
Yes	85 (95.5)	242 (78.3)	327 (82.2)
No	4 (4.5)	67 (21.7)	71 (17.8)
Age at delivery of last baby			
15-19	9 (7.3)	9 (2.6)	18 (3.9)
20-34	102 (82.3)	254 (74.5)	356 (76.6)
>35	13 (10.5)	78 (22.9)	91 (19.6)
ANC on the last pregnancy			
Yes	117 (94.4)	263 (77.1)	380 (81.7)
No	7 (5.6%)	78 (22.9)	85 (18.3)
Number of ANC visit			
Less than Four	43 (36.8)	154 (58.6)	197 (51.8)
More or equal to four	74 (63.2)	109 (41.4)	183 (48.2)
Informed where to deliver			
Yes	104 (88.9)	213 (81)	317 (83.4)
No	13 (11.1)	50(19)	63 (16.6)
Duration of labour			
Less than 12 hours	94 (75.8)	291 (85.3)	385 (82.8)
Greater than 12 hours	30 (24.2)	50 (14.7)	80 (7.2)
Health problem on last delivery			
Yes	38 (30.6)	41 (12)	79 (17)
No	86 (69.4)	300 (88)	386 (83)

Decision making concerning the delivery place was done by the mother herself in 79.2% of controls and 71% of the cases. Figure 3 shows the different decision makers among cases and controls.

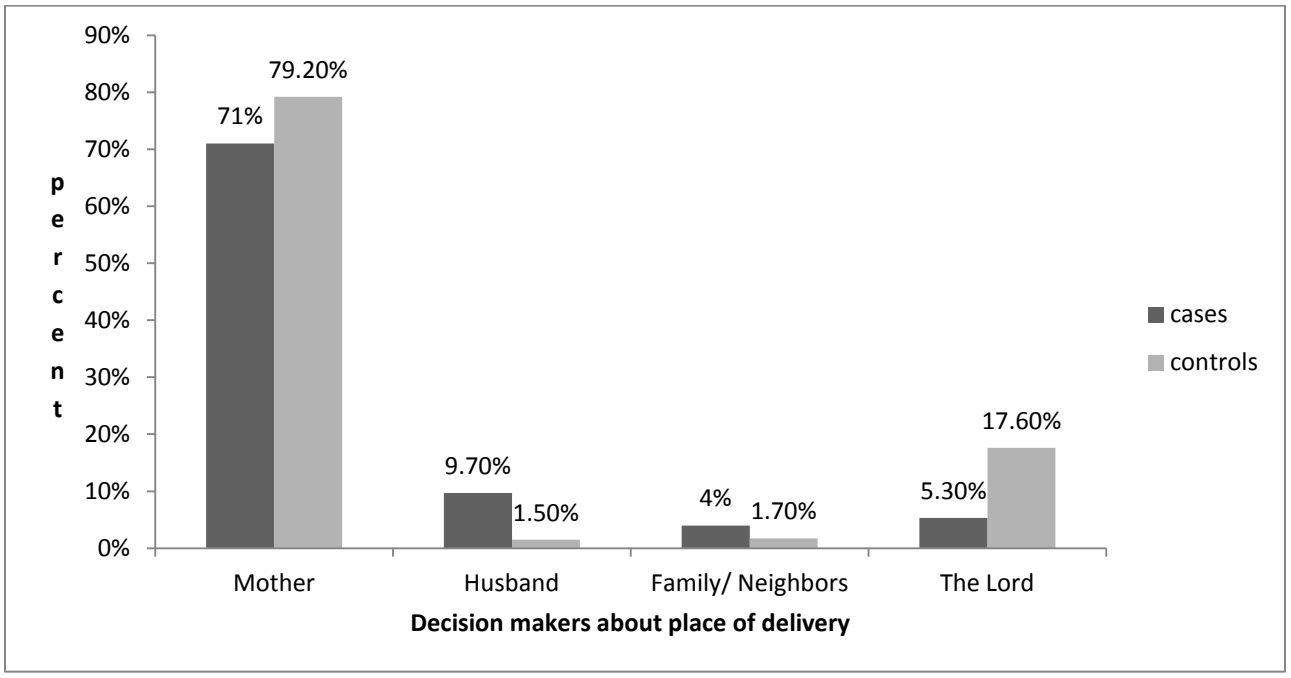

Figure 3. Mentioned decision makers about place of delivery by mothers who have given birth in the past one year in Butajera DSS, 2013.

5.4. Factors associated with institutional delivery among mothers who have given birth in the past one year in Butajera DSS, 2013

5.4.1. Logistic regression

Bivariate analysis was done to assess the association of each independent variable with institutional delivery using the logistic regression model. To identify independent factors associated with institutional delivery and to control for the effect of confounding factors, hierarchal multivariate logistic regression was done. All independent variables with p-value less than 0.2 in the bivariate analyses were including in the first three models. Then from each of the first multivariate analysis, variables with p- value less than 0.05 were used to fit the final multivariate logistic regression model.

From the sociodemographic variables age and expenditure were analyzed as a continuous variable. The bivariate logistic regression showed that as age of mother increases by one year the probability of delivering in health institution will decrease by 6% (p=0.001). Concerning ethnicity, mothers from Gurage/Mareko ethinic group are more likely to deliver in health institution. Mothers who attended secondary school or above are 31.9 times more likely to give birth at health institution than those with no education. Likewise mothers with husbands who attended secondary school or above are 14.7 times more likely to give birth at health institution than those with no education. On the contrary merchants mothers (COR=2.9; 95% CI: 1.7, 5.2)(p=0.000) compared to house wives and mothers with merchant husbands (COR= 7.6; 95% CI : 4.1, 14.3)(p=0.000) compared to farmers have increased probability of giving birth in health institution. Mothers who reside in urban area (COR=25.9; 95% CI: 15.2, 44.3) (p=0.000) and who only walk for less than 30 minutes to reach health institution (COR=1.9; 95% CI : 1.3, 2.9)(p=0.002) have a greater chance of delivering in health institution. It was also found that for every one birr increase in household expenditure (income) the chance of delivering in health institution increases by 0.2% (p=0.000). But religion, marital status and use of media were not associated with home delivery.

From the sociodemographic variables that were found to be predictors for institutional delivery in the bivariate analysis, age, household expenditure and residence were found to remain as independent predictors after controlling for other factors in the multivariate analysis.

Table 4: Sociodemographic determinant factors for utilization of IDS among mothers who have given birth in the past one year, Butajera DSS, 2013. (Model I)

Variable	Study subject		COR (95% CI)	AOR (95%CI)
	Cases n(%)	Control n(%)		
Age at interview			0.94(0.9,0.97)*	0.94 (0.89,0.98)*
Ethnicity				
Silti	22 (17.7)	100 (29.3)	1	1
Gurage & Mareko	97 (78.2)	209 (61.3)	2.1(1.2, 3.5)*	1.01(0.5, 2)
Others[2]	5 (4)	32 (9.4)	0.7(0.2, 2)	0.3((0.1, 1.1)
Husband education status				
No education	31 (25.2)	173 (51.2)	1	1
Primary school	63 (51.2)	154 (45.6)	2.3(1.4, 3.7) **	0.9(0.5, 1.8)
Secondary school and above	29 (23.6)	11 (3.3)	14.7(6.6, 32.7)**	1.3(0.4,4.5)
Husband occupation				
Farmer	35 (28.5)	277 (82)	1	1
Merchant	28 (22.8)	29(8.6)	7.6(4.1,14.3) **	0.6(0.2, 2.2)
Government /Private employee	60 (48.8)	32 (9.5)	14.8(8.5,25.8) **	0.6(0.2, 2.3)
Mother educational status				
No education	40 (32.3)	243 (71.3)	1	1
Primary school	63 (50.8)	94 (27.6)	4.1(2.6, 6.5) **	1.7(0.8, 3.2)
Secondary school and above	21 (16.9)	4 (1.2)	31.9(10.4, 97.7) **	3 (0.6, 13.3)
Mother occupation				
Housewife	83 (66.9)	300 (88)	1	1
Merchant	28 (22.6)	34 (10)	2.9(1.7,5.2) **	1.2(0.5, 2.6)
Government employee	8 (6.5)	1 (0.3)	28.9(3.5, 234.5) *	3.4(0.2, 75.6)
Others[1]	5 (4)[1]	6 (1.8)	3(0.9, 10.1)	4.7(0.9, 25)
Expenditure			1.002(1.001,1.003*	1.001(1, 1.002)*
Residence				
Rural	32 (25.8)	307 (90)	1	1
Urban	92 (74.2)	34 (10)	25.9(15.2, 44.3) **	23.4(6.8, 80.2)**
Time spent to reach to health institution				
Greater than 30 min	42 (33.9)	170(50)	1	1
Less or equal to 30 min	82 (66.1)	170(50)	1.95(1.3, 2.9)*	0.89(0.5,1.7)

*p-value < 0.05, **p-value < 0.001, [1]Private employee, Student, [2]Amhara, Oromo,kontoma

Knowing the presence of delivery service in nearby health institution (COR= 6.1; 95% CI: 1.4, 25.9) and believing it is necessary to use the service (COR= 9.03; 95% CI: 2.1, 37.9) increases the probability of delivering in health institution. Mothers with husbands who feel it is necessary to use delivery service are 6.7 times more likely to deliver at health institution than those who don't. This association is also true for neighbors (COR=5.7; 95% CI: 1.3, 24.6) and family (COR=3.8; 95% CI: 1.3, 10.9) attitude towards use of delivery service. In addition controls were more likely to prefer home as delivery place and female birth attendants than cases. Mothers who perceive the cost of delivery service (COR=2.5; 95% CI: 1.6, 4) and transportation (COR=2.3; 95% CI: 1.5, 3.7) as cheap are more likely to give birth in health institution than those who perceive the cost as expensive. Moreover mothers who think that giving birth at home has risk are 8.3 times more likely to deliver at health institution than those who don't think as such. On the contrary mother who think giving birth at health institution as risk are less likely to deliver at a health institution.

Among variables related to the awareness and attitude of mothers; service provided by health professionals, preferred place of delivery, preference of delivery attendant's sex and considering giving birth at home as a risks has shown statistical significance in the multivariate analysis. Preference of female birth attendant was found to prevent mothers from delivering in health institution by 62% when compared to mothers who don't mind the sex of the delivery attendant. In addition mothers who prefer to delivery at home are 0.2% less likely to deliver in health institution compared to those who prefer to deliver in health institution. But mothers who think giving birth at home has a risk are 4.5 times more likely to deliver in health institution than those who think otherwise.

Table 5: Awareness and attitude related determinant factors for utilization of IDS among mothers who have given birth in the past one year, Butajera DSS, 2013. (Model II)

Variables	Study subject		COR(95% CI)	AOR (95% CI)
	Case n(%)	Control n(%)		
Aware of presence of IDS				
Yes	122 (98.4)	310 (90.9)	6.1 (1.4, 25.9)*	NI
No	2 (1.6)	31 (9.1)	1	
Attitude towards health professionals				
Good	101 (81.5)	249 (73)	0.8 (0.3, 2.4)	0.5(0.1, 2.2)
Medium	16 (12.9)	31 (9.1)	1.03 (0.3, 3.5)	0.7(0.1, 4.2)
I don't know	2 (1.6)	51 (15)	0.08(0.01,0.5)*	0.08(0.009,0.7*
Bad	5 (4)	10 (2.9)	1	1
Necessary to use delivery service				
Yes	122 (98.4)	297 (87.1)	9.03(2.2, 37.8)*	0.1(0.01, 1.2)
No	2 (1.6)	44 (12.9)	1	1
All mother should use delivery service				
Yes	118 (95.2)	216 (63.3)	11.4(4.8, 26.6)**	2.4 (0.6, 8.5)
No	6 (4.8)	125 (36.7)	1	1
Husband feel it is necessary to use IDS				
Yes	116 (94.3)	268 (79.3)	6.7 (1.6, 28.4)*	2.1 (0.3, 14)
I don't know	5 (4.1)	39 (11.5)	1.98 (0.4, 10.9)	7.7 (0.8, 71.7)
No	2 (1.6)	31 (9.2)	1	1
Place preferred to give birth				
Home	10 (8.1)	196 (57.5)	0.06 (0.03,0.1)**	0.2(0.07,0.5)**
Health institution	114 (91.9)	145 (42.5)	1	1
Preferred Delivery attendant's sex				
Male	22 (17.7)	12 (3.5)	1.01 (0.4, 2.6)	1.5 (0.5, 4.4)
Female	73 (58.9)	313 (91.8)	0.1(0.06,0.2)**	0.4 (0.2, 0.8)*
Either one	29 (23.4)	16 (4.7)	1	1
Perceived cost of delivery service				
Cheap	88 (71)	141 (41.3)	2.5(1.6, 4)**	1.9 (0.9, 4.2)
I don't know	2 (1.6)	61 (17.9%)	0.1 (0.03, 0.6)*	0.3 (0.05, 1.9)
Expensive	34 (27.4)	139 (40.8)	1	1
Perceived cost of transportation				
Cheap	90 (72.6)	159 (46.6)	2.3(1.5, 3.7)**	1.04 (0.4, 2.4)
I don't know	3 (2.4)	53 (15.5)	0.2 (0.07, 0.8)*	0.8 (0.1, 4.6)
Expensive	31 (25)	129 (37.8)	1	1
Risk in giving birth at home				
Yes	117 (94.4)	228 (66.9)	8.3 (3.7, 18.3)**	4.5 (1.8, 11.6)*
No	7 (5.6)	113 (33.1)	1	1
Risk in IDS				
Yes	7 (5.6)	49 (14.4)	0.3 (0.1 , 0.8)*	0.4 (0.2,1.2)
No	117 (94.4)	292 (85.6)	1	1

*p-value < 0.05, **p-value < 0.001, NI - Not included in the model

Other important determinant factors associated with institutional delivery were obstetric history related variables. Mother with more than five pregnancy are 95% less likely to deliver in health institution than mothers with one pregnancies. Similarly, as the number of children and the birth order of the last child increase the probability of giving birth in health institution decreases. History of delivering in health institution was found to increase the likelihood of delivering in health institution. Utilization of antenatal care follow up in both previous pregnancies (COR=5.9; 95% CI: 2.1, 16.6) and last pregnancy (COR=4.9; 95% CI: 2.2, 11.07) were associated with increased probability of delivery at health institution. However among mothers who had ANC follow up, those with less than four visit are 0.4 times less likely to deliver at health institution compared to those with four or more visits. History of death of a newborn was also associated with decreased probability of delivering in health institution.

When decision making about place of delivery is made by husband, the probability of delivery in health institution is 7.4 times higher compared to decision making by mothers. Mothers with less than 12 hours of labour (COR= 0.5; 95% CI: 0.3, 0.9) have less probability of delivering in health institution while mothers with health problem during delivery (COR= 3.2; 95% CI: 1.9, 5.3) has a higher probability.

In the multivariate analysis; place of delivery previous children, health problems during delivery and decision maker about place of delivery were significantly associated with institutional delivery service. Mothers with history of delivery both in health institution and home (AOR= 6; 95% CI: 2.7, 13.4) are more likely to deliver in health institution compared to mothers with history of all previous delivery at home. Likewise mothers who had health problems during delivery are 4.1 times more likely to deliver in health institution compared to those who didn't have health problem. Also having the husband decide on place of delivery increases the probability of delivering in health institution. All other variables included in the multivariate analysis lost their statistical significance.

Table 6: Obstetric history related determinant factors for utilization of IDS among mothers who have given birth in the past one year, Butajera DSS, 2013. (Model III)

Variables	Study subject		COR(95% CI)	AOR(95% CI)
	Cases n(%)	Controls n(%)		
Parity				
Greater than 5	23 (18.5)	141 (41.3)	0.17 (0.08, 0.2)**	0.6 (0.08, 4.8)
2-4	63 (50.8)	161 (47.2)	0.4 (0.2, 0.7)*	1.1 (0.1, 8.3)
0-1	38 (30.6)	39 (11.4)	1	1
Place of delivery of previous children				
All health institution	41 (46.1)	5 (1.6)	167.4(56, 500.1)**	138.5(39.6,484)**
Some home & some ID	36 (40.4)	59 (19.1)	12 (6.1, 25.4)**	6 (2.7,13.4)**
All home	12 (13.5)	245 (79.3)	1	1
History of death of a newborn				
Yes	151 (44.3)	33 (26.6)	0.4 (0.3, 0.7)*	0.7 (0.3, 1.5)
No	190 (55.7)	91 (73.4)	1	1
ANC on previous pregnancy				
Yes	85 (95.5)	242 (78.3)	5.9 (2.1, 16.6)*	1.3 (0.2, 8.7)
No	4 (4.5)	67 (21.7)	1	1
ANC on the last pregnancy				
Yes	117 (94.4)	263 (77.1)	4.9 (2.2, 11.1)**	NI
No	7 (5.6)	78 (22.9)	1	
Number of ANC visit				
Less than Four	43 (36.8)	154 (58.6)	0.4 (0.26, 0.6)**	0.6 (0.3, 1.3)
More or equal to four	74 (63.2)	109 (41.4)	1	1
Informed where to deliver				
Yes	104 (88.9)	213 (81)	1.9 (0.97, 3.6)*	0.7(0.26, 1.87)
No	13 (11.1)	50 (19)	1	1
Decision maker about place of delivery				
Husband	12 (9.7)	5 (1.5)	7.4 (2.5, 21.5)**	14.7 (2.2, 98.8)*
Family/ Neighbors	5 (4)	6 (1.7)	2.5 (0.8, 8.6)	3.1 (0.4, 25.7)
The lord	19 (15.3)	60 (17.6)	0.97 (0.5, 1.7)	1.1 (0.4, 2.9)
Mother	88 (71)	270 (79.2)	1	1
Duration of labour				
Less than 12 hours	94 (75.8)	291(85.3)	0.5 (0.3, 0.9)*	0.78 (0.3, 2.1)
Greater than 12 hours	30 (24.2)	50 (14.7)	1	1
Health problem during last delivery				
Yes	38 (30.6)	41 (12)	3.23 (1.9, 5.3)**	4.1(1.8, 9.6)*
No	86 (69.4)	300 (88)	1	1

*p-value < 0.05, **p-value < 0.001, NI-Not included in the model

5.4.2. Final multivariate logistic regression

A final multivariate logistic regression model was fitted with ten variables having a p value of less than 0.05 from the above three multivariate analysis. Five variables were found to predict utilization of IDS. From this final model it was found that for every one year increase in age the chance of delivering in health institution decreases by 11%. Living in urban area at the time of delivery was associated with increase in institutional delivery. In addition mothers who had all delivery of previous children in health institution and history of health problem during delivery are more likely to deliver in health institution. The other variables included in the model; expenditure, attitude towards health professionals, preferred of place of delivery, preference of delivery attendant's sex and considering home birth as a risk lost their statistical significance.

Table 7: Multivariate analysis of factors associated with utilization of IDS among mothers who have given birth in the past one year, Butajera DSS, 2013. (Final Model)

Variables	AOR(95% CI)	P-value
Age at interview	0.89 (0.83, 0.97)	0.005
Residence		
Urban	23.2 (6.8, 78.2)	0.000
Rural	1	
Decision maker about place of delivery		
Husband	12.4(0.7, 203.9)	0.78
Family/ Neighbors	13.9(1.1, 181.6)	0.04
The lord	0.37(0.1, 1.3)	0.12
Mother	1	
Place of delivery of previous children		
All home	0.2 (0.09, 0.6)	0.002
All health institution	3.8 (1.1, 13.7)	0.03
Some home & some health institution	1	
Health problem during last delivery		
Yes	12.6 (4.6, 34)	0.000
No	1	

6. Discussion

This study has shown that the main determinant factors for utilization institutional delivery service are age of mother, residence at the time of delivery, place of previous deliveries, decision maker about place of delivery and history of health problem during last delivery.

6.1 Age of a mother and utilization of institutional delivery

In this study, increase in age of mother was associated with less probability of using IDS. In similar studies done at in different parts of the country including in-depth analysis of EDHS, age was an important predictor of place of delivery[41]. A study done in south west Ethiopia showed that mothers less than 20 years of age during the interview were more likely to deliver at health institutions than mothers more than 35 and above[37]. Studies done in Kenya and Indonesia have also shown that younger women are more likely to utilize delivery services since they are more prone to complications than older women[7, 39]. But a study in Nigeria found that age of a mothers has no association with utilization of delivery care[30].

The fact that younger mothers utilize IDS more than older mothers may be due to mothers having their first baby which occurs at a younger age will be expected to have a difficult labour so there is a tendency to deliver in health institution. As explained by mothers in the FGDs, young mothers with their first pregnancy tend to go to health institution while older women stay home to give birth. In addition the community seems to recognize that younger mothers are at risk of complication during deliver which is a one of the criteria to use institutional delivery as shown in the qualitative part of the study.

The other reason may be as the age of a mother goes on so will her experience in the delivery process; this will make the mother confident enough to prefer home birth assisted by neighbors and family. On top of all this, older mother when compared to the younger ones are more obedient to the cultural norms of the community which is giving birth at home.

6.2. Residence and utilization of institutional delivery

Mothers who live in urban residence at the time of delivery are more likely to deliver in health institution compared to mothers in rural area. A systematic review done with ten studies on urban-rural differences in delivery in medical settings from eleven developing countries showed that urban women were significantly more likely than rural women to deliver in medical settings[42]. Similar studies done in India, Nigeria and Ethiopia have also shown that residential area is a strong predictor of utilization of IDS[29, 30, 38, 43, 44].

This may be because of mothers in urban areas are in close proximity to health institution and availability of various means of transport to reach health institutions. A similar study in Ethiopia also indicated the difference in access especially in terms of physical distance which is important for service utilization may be the reason for this finding[26]. In addition different health education about utilization of maternal health care can easily reach urban mothers when compared to the mothers in rural area.

Rural mothers are more influenced by cultural norms which are often resistant to change. Traditional birth attendants and traditional healers are also mostly abundant in rural area making it convenient for mothers to deliver at home. Rural women are usually less educated and thus it may be difficult to come up with attitudinal change about the use of delivery service.

6.3. Place of delivery of previous children and utilization of institutional delivery

One interesting finding of this study was that history of previous home delivery decreases the probability of using IDS in the future while history of health institution delivery increases the probability when it is compared to mothers who have history of mixed use. According to a study done in Ethiopia regarding pattern of maternal care service utilization, it was shown that the probability of not receiving delivery care given the preceding birth didn't receive care was 0.988[38]. Similarly a study in Nepal stated that one of the reasons for home deliveries were related to experience of previous home deliveries[27].

This study showed mothers who have history of home birth will probably keep on delivering home in the future because the set up and the scenario will be familiar and comfortable for them. They will be confident to deliver home and less motivated to utilize IDS. In addition this mothers will not have the chance to be exposed to the delivery service provided in health institution and this will lead them not to have a clear understanding about the advantage and the services in health institution.

6.4. Health problem during delivery and utilization of institutional delivery

Mothers who had health problems during labour were found to deliver in health institution more than mothers who had no health problem. A study done in north west Ethiopia reported that the utilization of safe delivery services was about five times higher among those who previously had developed one of the life threatening obstetric complications[35]. Another study done in Woldia,

Ethiopia showed that the most common reasons for home delivery were precipitate, smooth and short labor showing that if the labour seems normal mothers will not try to use IDS[31].

This implies that significant proportions of mothers seek help from skilled birth attendants after developing obstetric complications and when other traditional interventions fail. This finding is consistent with findings from both FGDs and in-depth interviews. The most commonly mentioned criteria to use IDS is when mother is in labour for a prolonged time , when she is too weak to labour and when a TBA recommends the mother to go to health institution. Health extension workers also said mothers only come after days of labour or massive bleeding.

6.5. Decision maker about place of delivery & utilization of IDS

This study has shown that mothers are more likely to deliver in health institution when decision about place of delivery is made by a relative (neighbors/family) rather than the mother herself. A study done in Ethiopia showed that husband and relatives decision about the place of delivery has an increasing effect of utilizing health care delivery than decision made by the mother herself. In others studies this was explained as, if women are encouraged by husbands and relatives they would get financial and other social supports to go to health facility which would allow them to have health care assisted delivery[26].

As explained in the qualitative part of this study, primarily mothers prefer to deliver at home but as the labour starts and goes on her husband and neighbors are the ones to decide about place of delivery. Especially when there is complication with labour and the mothers is too weak or incapacitated to make a clear decision; it will be up to the neighbors to decide.

6.6. ANC Utilization & Economic status

In similar studies done, one of the most common predictors was found to be history of antenatal care visits. Surprisingly so this study shows that history of use of ANC isn't significantly associated with utilization of IDS. A study done in Oromiya Region, Ethiopia also didn’t show any association between the two[26]. But in a study done in north west Ethiopia, ANC visit during last pregnancy was found to be a strong predictor of institutional delivery service utilization[35]. This variation across the regions in the country may be due to difference in quality of the ANC service.

According to the qualitative part of this study, both male and female respondents feel that using ANC services makes a mother healthy and normal enough to give birth at home.

In this study house hold monthly expenditure was taken to approximate for economic status of mothers and it showed no significant association with utilization of IDS. According to a systematic review, a high-quality study showed no effect of economic status, defined by landholding size across three groups in Bangladesh and a moderate-quality studies undertaken in Guatemala and Tajikistan showed no effect of economic status, measured by food consumption and per-capita household expenditure, respectively [42]. But many similar studies in India, Vietnam, Nigeria and Burkina Faso have shown that financial level of mothers was an important predictor of delivering in health institution [24, 28, 30, 45]. This difference in findings across different countries may be due to difference in health care financing and ways of measuring economic status.

Provision of free delivery service may be a reason for not having expenditure as a predictor for IDS utilization. The fact that this study didn't show association may also be due to possible over and under rating of the expenditure by mother which would have been prevented by doing a wealth index if it wasn't resource intensive.

6.7 Attitudes of the mothers towards ID as shown in the qualitative part of the study

Both female and male respondents said that there is no sufficient service in the nearby health post and health center. They don't believe to get delivery service from the nearby health institution. HEW in the nearby health posts are not trusted by the community to provide delivery service. The community feels that the health center is filled with practicing students if not by unqualified health professionals. There are claims of mistreatment which prevents mothers from seeking delivery care. A qualitative study done in Kembatta-Tembaro, Ethiopia showed that utilization of delivery service were related to competent health workers, perceived quality of care and previous negative experiences with health facilities [46]. Another qualitative study in Burkina Faso showed that the reception and providers' kindness are important in the use of health services. When the interaction is bad, women are reluctant to go back [16].

7. Strength and limitation of the study

7.1. Strength of the study

The following are the strength of the study

- Both qualitative and quantitative methods were used increasing the validity of the study.
- The study used well experienced data collectors which results a high quality data.
- Both the cases and the controls were selected from the community which minimizes selection bias.

7.2. Limitation of the study

The following are the possible limitation of the study

- Being a case control study, it can only tell the presence of association but not causal relationship.
- Since mothers who have given birth in the past one year period were included in the study, recall bias may occur.
- Using household expenditure rather than wealth index as a measure of economic status may cause information bias.
- There are some wide confidence intervals resulting in less reliable finding due to having small samples in each value for some variables.

8. Conclusion

This study has revealed that there are various factors affecting utilization of institutional delivery services. Age of a mother was found to be one of them, showing that increase in age was preventive of using delivery care. There was a significant difference between urban and rural residing mothers regarding utilization of IDS. Rural mothers were less likely to deliver in health institution which calls for further interventions to improve utilization and minimize the gap between the urban and the rural mothers. Having health problem at the time of delivery was found to be a determinant of IDS use. This indicates delivery service isn't required by all mothers in labour regardless of their health condition. Mothers were found to deliver in health institution more when decision about place of delivery is made by neighbors and family. This shows encouragement from family and neighbors helps a mother to deliver in health institutions. Place of delivery of previous children was found to determine the chance of utilizing IDS in the future, indicating there may be certain patterns in choice of place of delivery.

Mothers are not convinced about the necessity and quality of the service provided in health institution which hampers improvement in utilization of IDS. Moreover the community has doubts on the qualification of health care providers and on the services given by them. There is also confusion regarding the cost of delivery service and the accessibility of the ambulance service. More importantly home delivery and TBA assistance is of a cultural and traditional value of the community.

9. Recommendation

The following recommendations are forwarded for the concerned bodies based on the findings of the study:

❖ **At program level**

- Interventions done to improve utilization of institutional delivery service should focus mainly on those mothers who have never utilized IDS, rural mothers and older women.
- Improvement in quality of the delivery services in the nearby health facilities should be done to decrease the gap between urban and rural in utilization of IDS.
- Monitoring of implementation of free delivery service throughout the different levels of health facilities should be done.

❖ **At community level**

- Health extension workers and health professionals need to create awareness among women on the unconditional necessity of institutional delivery service utilization.
- Advocacy regarding institutional delivery should be done to change the outlook of mothers towards the delivery services and delivery attendants.

❖ **For researchers**

- Further studies should be done on the quality of delivery services to identify factors associated with mother's attitudes towards institution delivery services.

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11. ANNEXES

Annexes I :Conceptual frame work

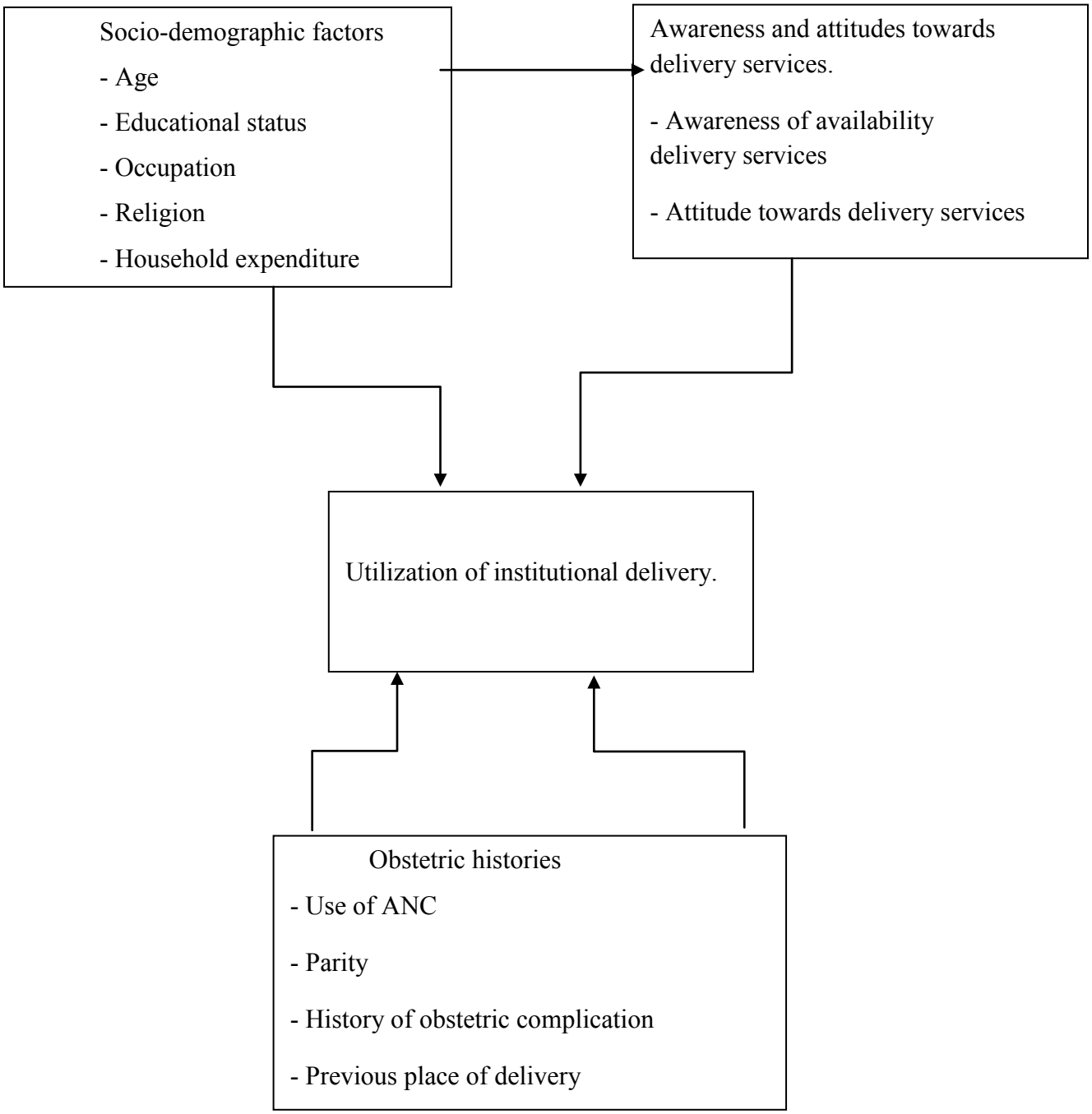

Figure 4. A conceptual frame work for assessing factors affecting utilization of institutional delivery.

Annex II. Sample size determination process

Table 8. Sample size determination procedure, 2013

Exposure	Proportion(%)of exposures in		Sample Size for		Total sample size
	Cases	Controls	Cases	Controls	
Rural residence	17.6	76	9	26	35
No education	8.5	47	18	52	70
ANC utilization	7.9	46.3	18	52	70
Husband's negative attitude towards ID	1.29	15	57	171	228
Parity	51.7	21.9	30	89	119
Age at 1st pregnancy	68.7	38.4	32	95	127

Considering a design effect of two, the minimum sample size was 456 (114 cases and 342 controls). Adding 10% for possible non response rate and another additional 5% due to the high migration in one of the kebeles a sample size of 131 cases and 376 controls were involved in the study.

- The final sample size will be = 507
- Cases (n_2) = 131
- Controls (n_1) = 376

Annex III : Sample frame preparation format from the Butajera DSS Record

No	Name of Kebele	House Hold number	Head of HH	Name of the mother	Place of delivery Home(control) Health institution (case)

ANNEX IV: English participant information sheet

Participant Information Sheet

Description of the study

Title of the study: Factors associated with utilization of institutional delivery among mothers in the Butajera DSS.

Objective of the study: The objective of the study is to asses factors associated with utilization of institutional delivery among mothers in the Butajera DSS.

Introduction: Maternal mortality is unacceptably high. Most maternal deaths are avoidable, as the health-care solutions to prevent or manage complications are well known. An important component of efforts to reduce health risks to mothers and children is increasing the proportion of babies that are delivered in health facilities. Ethiopia has one of the lowest utilization of institutional delivery.

Rationale of the Study and its benefits

To improve maternal health, barriers that limit utilization and access to quality maternal health services must be identified and addressed. Mothers in Ethiopia still prefer to give birth at home for various reasons and this research intends to identify the major factors that are associated with the low affecting utilization of institutional delivery.

Information which is necessary for the study will be collected by trained data collectors using structured questionnaire which is in Amharic language.

ANNEX V : English consent form

Good Morning/Afternoon, My name is _____. I am a trained data collector for the research, factors associated with utilization of institutional delivery in Butajera which is being conducted by Bezawit Eyob who is a Master of public Health student in Addis Ababa University. Your kebele and your house are selected as a matter of chance; and nothing special is attached to it. The interview will take about 30 minutes. If you participate in the study, there will not be any harm to you or your family because of your participation in the study. Your name and other personal identifiers will not be recorded on data collection form and the information that you give us will be kept confidential. The information you provide will not be used for another purpose than this study. For this interview, there will not be an immediate benefit in terms of money; rather the information you provide will help the government and concerned bodies to improve utilization of delivery services which can also benefit you and your community. You can leave any questions unanswered or withdraw from responding for any reasons you may not need to mention.

You have full right not to give information for this study. But the information that would be taken will be useful for the study since the purpose of this interview is to identify factors associated with home delivery which will help to reduce health risks to mothers and children. The interview will start when you give permission, participation is totally voluntary.

If you have any question you can contact the principal investigator at any time convenient for you using the following address:

Name of the Principal Investigator (PI): Bezawit Eyob Kase

Mobile Phone number: 0911820815, E-mail bmuchit@yahoo.com

Are you willing to let your information to be utilized for this study?

1. Yes 2. No

Name and Signature of the interviewer which shows that the respondent has consented (verbally) to take part in the study _____

ANNEX VI: English version of questionnaire

Addis Ababa University
School of Public health
English version of structured questionnaire

Identification

Questionnaire code ☐
Kebele ☐
House number ☐

Instruction: Circle the responses for questions with alternatives

Part 1: Sociodemographic and economic questions

S.No	Questions	choice of response	Code	Skip
101	What is your age in completed years?	_____**years**		
102	What is your religion?	Orthodox.....1 Muslim . . . .2 Protestant . . . .3 Others specify.....99		
103	What is your ethnicity?	Guragie.....1 Oromo. . . . .2 Amhara. . . . .3 Tigre . . . .4 Silte ……. 5 Others specify.....99		
104	What is your current marital status?	Married.....1 Single.....2 Divorced.....3 Widowed.....4 Others, specify.....99		If other than 1 skip to 106
105	If married, What is the educational status of your husband?	Secondary education above.....1 Grade 5-8.....2 Grade 1-4.....3 No education.....4		
106	What is your educational status?	Secondary education above.....1 Grade 5-8.....2 Grade 1-4.....3 No education.....4		
107	What is your occupation?	Farmer.....1 House wife.....2 Merchant.....3 Student.....4		

		Others, specify.....99		
108	What is the occupation of your husband or head of the Household? (If married)	Farmer.....1 Merchant.....2 Government employee.....3 Private employee.....4 Daily laborer.....5 Student.....6 Others specify..... 99		
109	What is the average monthly expenditure of the family or the Household?			
110	Where was your residence during Last delivery?	Urban.....1 Rular 2		
111	How far is the nearby health institution from your house? (In terms of hours it takes to reach on foot)	..... min		
112	Which one of the following media does your family use?	Radio ……..1 Television ……..2 Newspapers……3 Others specify…….4		

Part 2 Awareness and attitude towards delivery services

201	Do you know delivery services are given on your nearby health institution?	Yes.....1 No 2		
202	How do you feel about the health professionals in health institution	Good ----------1 Medium ----------2 Bad ----------3 I don't know----------4		
203	Do you feel that utilization of delivery services in health institution is important?	Yes.....1 No 2		
204	Do you think all pregnant women should deliver in health institution?	Yes.....1 No 2		If yes skipto205
205	If no, who do you think should use the services? tick	Mothers with bleeding…… Mothers with prolonged labour… Mothers with their first pregnancy…… When there is no TBA…… Others specify…….		

206	Does your husband feel that utilization of delivery services in health institution is important? (for married)	Yes.....1 No .....2 I don't know……3		
207	Do your relatives feel that utilization of delivery services in health institution is important?	Yes.....1 No .....2 I don't know……3		
208	Where do you prefer to give birth?	Home ……1 Health institution……2 Other specify……99		
209	Who do you prefer to assist you during delivery? tick	Health professional..... Relative …… Traditional birth attendants….. Others specify…….		
210	What sex of birth attendant do you prefer during your delivery?	Male ……1 Female ……....2		
211	What do you feel about the cost of delivery service in health institution?	Costy……..1 Cheap…….2 Don't know……3 Others specify……99		
212	What do you feel about the cost of transportation delivery service in health institution?	Costy……..1 Cheap…….2 Don't know……3 Others specify……99		
213	Do you think child birth at home has a risk?	Yes.....1 No 2		
214	Do you think child birth in health institution has a risk?	Yes.....1 No 2		
215	Do you know danger signs during delivery?	Yes.....1 No 2		
216	If yes, what are they? More than one answer is possible.	Mothers with bleeding--------1 Mothers with long labour-----2 Baby stops moving ----------3 Placenta doesn't appear---------4 Abnormal position of baby------5 Others specify _____		

Part 3: Obstetric history questions

S.No	Questions	choice of response	Code	Skip
301	How many children do you have? (alive)	Male _____ Female _____		
302	How many pregnancies did you have?			
303	Have you ever had the following conditions before the delivery of your last baby? tick	Still births..... Died in less than 30days..... Died between 30 days and 1 year..... Others specify.....99		
304	What was the birth order of the Last child?			If 1 skip to 309
305	If you have more than one delivery, where did you deliver your older children?	All home……...1 All health institution…….2 Some home and some health institution…….3 Others specify…….99		
306	Have you ever faced any pregnancy related problem while giving birth	Yes.....1 No.....2		If no, skip to 308
307	If yes, what did you do?	Went to health institution……..1 Took traditional medicine……..2 Consulted TBA……...3 No action taken…….4 Others specify……99		
308	Have you ever visited health institution during your previous pregnancies	Yes.....1 No.....2		
309	Did you have Antenatal care visit during your last pregnancy	Yes.....1 No.....2		If no , skip to 313
310	If yes, how many visits did you have?	One ……1 Two…….2 Three……...3 Four……4 Other specify……99		
311	During your visit, were you informed about where to deliver?	Yes.....1 No.....2 Don't know……3		
312	If yes where were you told to deliver?	Home ……1 Health institution……2 Other specify…….99		

313	Where did you deliver your last child?	Home ……..1 Health institution…… 2 Other specify……...99		
314	Who decided the place of delivery for you on your last delivery?	Myself ……1 My husband……2 My relatives……..3 Others specify……99		
315	How long was the duration of your last labour?	Less than 12 hours……1 12- 24 hours……..2 Greater than 24 hours……...3 Don't remember…….,,,…4		
316	Did you face any pregnancy related problem during your last delivery?	Yes.....1 No.....2		
317	If yes, what did you do?	Went to health institution……..1 Took traditional medicine……..2 Consulted TBA……...3 No action taken……4 Others specify……99		

That is the end of our questionnaire. Thank you very much for taking time to answer these questions. We very much appreciate your help.

ANNEX VII : Amaharic version of consent form

KØ“~ተሳታፊዎች ¾ðnÅ˜ƒ SÖ¾mÁ pî

Ö?“ ÃeØM˜ eT@----------ÃvLM eMÖ“ ¾¨cÉŸ< S[Í cwdu= ’˜:: u›.› ¿”y`e+ ¾ÉI[ U`n ¦T] ¾J’‹¨< u?³©ƒ ÅÄw KUƒc^¨< Ø“ƒ S[Í Ÿ›“„‹ ›¾cucwŸ< ’¨<::

kuK?-ƒ“ u?ƒ- ¾¦S[Ö¨<u›ÉM c=J” M¿ U¡”Áƒ ¾K¨<U:: ØÁo“ SMc< 30 Åmn ¾T>¨eÉ ÃJ“M:: uØ“~ LÃ wƒd¦ñ u›`e-U J’ uu?¦cw- LÃ U”U Ñ<Çƒ ›ÃÅ`eU:: eS-ƒU J’ K?L T”’ƒ” ¾T>ÑMî S[Í SÖÃl LÃ ›ÃVLU:: ¾T>cÖ<” T”—¨<U S[Í T>eØ^©’ƒ ¾¦Öuk c=J” S<K<KS<K< KU`U` e^ w‰ Ã¨<LM:: Ø“~ LÃ uSd¦ð- ¾T>ÁÑ–<ƒ M¿ ØpU ›Ã*`U ’Ñ` Ó” ¾T>cÖ<ƒ S[Í KS”ÓeƒU J’ KT>SKŸ¦¨< ›ŸM ›“„‹ uÖ?“ ¦sU ?”É¨MÆ ¾T>ÁÅ`Ñ<ƒ” Ø[ƒ ¾T>[Ç ÃJ“M:: ÃlU K›`e-U J’ KT>*\uƒ Tlu[cw ÖnT> ÃJ“M::

SSKe ÁMðKÑ<ƒ” ØÁo S¦¨< ›”Ç=G<U nKSÖÃl” U¡”Á„ƒ” dÃÑMè›s`Ö¨< S¨<×ƒ Ã‹LK<&ǂ S[Í ÁKSeÖƒ S<K<Swƒ ›K-ƒ ’Ñ` Ó” S[Í¨< u?ƒ ¾S¨<KÉ U¡”Á„‹” uT¨<×ƒ ¾›“„‹”“ ¾MÐ‹” Vƒ KSk’e u×U ÖnT> ’¨<:: nKSÖÃl ›`e- õnÅ— c=J’< ¾T>ËS` c=J” ¦dƒð- uõnÅ˜ƒ LÃ ¾¦Se[¦¨<&

Ø“~” u¦SKŸ¦ ØÁo ŸK-ƒ ›Ø˜a” u?³©ƒ ÅÄw” ueM¡ lØ` u09118208l5 ¨ÃU u›=T@M ›É^hbmuchit@yahoo.comSÖ¾p Ã‹LK<&

uØ“~ LÃ KSd¦õ ðnÅ—’-ƒ

1. ›-
2. ›ÃÅKU

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ANNEX VIII: Amaharic version of questionnaire

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101	ÉT@-ƒ u=ÑMìM”	›Sƒ	
102	GÃT*ƒ	*`„Ê¡e 1	
		S<eK=U -----2	
		–a,e”ƒ---3	
		K?L "K ÃÑKì-----99	
103	wN?`	eMÖ----------1	
		Ñ<^Ñ@----------2	
		*aV----------3	
		›T^----------4	
		ƒÓ_----------5	
		K?L "K ÃÑKì-----99	
104	¾Òw‰ G<’@	ÁÑv‹----------1	SMc< ›”Å— ŸJ’ ¨Å 106 kØÃ
		ÁLÑv‹----------2	
		¾}ó‹------3	
		vKA ¾V}vƒ---4	
105	"Ñvi ¾vK?u?ƒi ¾ƒUl`ƒ G<’@	¢K?Ï/¿’>y`c=+ Ç=–KAT“ Ÿ²=Á uLÃ----1	
		2— Å[Í ƒUl`ƒ----------2	
		5-8----------3	
		1-4----------4	
		K?L "K ÃÑKì----------99	
106	Á”^ ¾ƒUl`ƒ Å[Í	¢K?Ï/¿’>y`c=+ Ç=–KAT“ Ÿ²=Á uLÃ----1	
		2— Å[Í ƒUl`ƒ----------2	
		5-8----------3	
		1-4----------4	
		K?L "K ÃÑKì----------99	
107	e^i	Ñu_----------1	
		¾u?ƒ Su?ƒ----------2	
		’ÒÈ----------3	
		}T]----------4	
		¾S”Óeƒ c^}----------3	
		K?L "K ÃÑKì----------99	
108	vKƒÇ` ŸJ”i ¾vKu?ƒi e^	Ñu_----------1	
		’ÒÈ----------2	
		¾S”Óeƒ c^}----------3	
		¾ÓM e^}----------4	
		¾k” c^}----------5	
		}T]----------6	
		K?L "K ÃÑKì----------99	
109	u?}cu< u¨` ¾T>ÁÑ–¨< Ñu=		

110	KSÚ[h Ñ>²? u¨KÉi Ñ>²? S*]Á u?⍰‡ ¾ƒ 'u`	Ÿ}T---------- 1 ÑÖ`---------- 2	
111	S*]Á u?ƒi u›p^u=Á "K¨< Ö?“ }sU U” ÁIM c›ƒ u⍰Ó` ÁeŸ?ÇM	----------	
112	u›p^u=Á "K¨< Ö?“ }sU HÅi ⍰¨mÁKi	›----------1 ›ÃÅKU------2	
113	u?}cwi ¾ƒ—¨<” ¾SÑ“— w²<G” ƒÖkTL‹G<	_Ç=¿ ---------- 1 ,K?y»” ---------- 2 Ò²?×---------- 3 ›”ÖkUU---------- 4 K?L "K ÃÑKì----------99	

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}.l	ØÁo	›T^à‹	
201	u›p^u=Ái ÁK¨< Ö?“ }sU ¨<eØ ¾¨K=É ›ÑMÓKAƒ ⍰”ÇK ⍰¨mÁKi	›----------1 ›ÃÅKU------2 K?L "K ÃÑKì----------99	
202	uÖ?“ }sU ¨<eØ ¾T>Ñ–¨<” ¾¨K=É ›ÑMÓKAƒ ¾T>cÖ< Ö=“ vKS<Á-‹” Se}”ÓÊ ⍰”Ç=ƒ ”¨<	Ø\ ----------1 SŸŸK– ----------2 SØö----------3 ›L¨pU----------4	
203	uÖ?“ }sU ¨<eØ ¾T>Ñ–¨<” ¾¨K=É ›ÑMÓKAƒ SÖkU ›eðLÑ> ”¨< wKi ⍰eu=ÁKi	›----------1 ›ÃÅKU----------2 K?L "K ÃÑKì----------99	
204	G<KU ⍰Ñ<’ ⍰“„‹ uÖ?“ }sU S¨KÉ ›Kv†¨< wKi ⍰eu=ÁKi	›----------1 ›ÃÅKU----------2 K?L "K ÃÑKì----------99	
205	SMc< ›ÃÅKU Ÿ]’ SŠ SÖkU ›Kv†¨< wKi ⍰eu=ÁKi Ÿ›”É uLÃ SSKc Ã‰LM	ÅU ⍰¾ðcd†¨< ÁK< ⍰“„‹--------1 UØ ¾q¾v†¨< ⍰“„‹----2 ¾SËS]Á MÍ†¨< Á[Ñ²< ⍰“„‹---3 ¾MUÉ ›ªLÏ ŸK?K-----4 K?L "K ÃÑKì----------99	
206	vKu?ƒi uÖ?“ }sU ¾T>cÖ¨< ¾¨K=É ›ÑMÓKAƒ ›eðHÑ>”¨< wKA ÁevM	›----------1 ›ÃÅKU----------2 ›L¨pU----------3 K?L "K ÃÑKì----------99	
207	ÕÅ—‹i ⍰“ ²SÊ‹l uÖ?“ }sU ¾T>cÖ¨< ¾¨K=É ›ÑMÓKAƒ ›eðLÑ> ”¨< wK¨ ÁevK<	›----------1 ›ÃÅKU----------2 ›L¨pU----------3 K?L "K ÃÑKì----------99	
208	¾ƒ S¨<KÉ” ƒS`ÝKi	u?ƒ ¨eØ----------1 Ö?“ }sU----------2 K?L "K ÃÑKì----------99	
209	T” u=ÁªMÉi ƒS`ÝKi	¾Ö?“ vKVÁ----------1 ²SÉ----------2 ¾MUÉ ›ªLÏ----------3 K?L K?L "K ÃÑKì----------99	
210	¾T>ÁªMÉi c¨< ï⍰¨< U” u=J” ƒS`ÝKi	¨”É---------- 1 c?ƒ---------- 2	

		K?L K?L "K ÃÑKì----------99	
211	uÖ?“ }sU ¨<eØ ¾T>cÖ¨< ¾¨Ќ=É ›ÑMÓKAƒ ¾Ñ”²w ¨Ü¨< U” ÃSeMhM	¨<É ”¨←---------- 1 ?'"¡ ”¨←---------- 2 ›L¨pU---------- 3 K?L K?L K?L "K ÃÑKì----------99	
212	uÖ?“ }sU ¨<eØ KS¨<KÉ ¾ƒ^”eþ`ƒ ¾Ñ”²w ¨Ü¨< U” ÃSeMhM	¨<É ”¨←---------- 1 ?'"¡ ”¨←---------- 2 ›L¨pU---------- 3 K?L K?L K?L "K ÃÑKì----------99	
213	uu?ƒ ¨<eØ MÏ S¨ЌÉ ›eÑ> ”¨< wKi ?eu=ÁKi	›---------- 1 ›ÃÅKU----------2 K?L K?L "K ÃÑKì----------99	
214	uu?ƒ ¨<eØ MÏ S¨ЌÉ ›eÑ> ”¨< wKi ?eu=ÁKi	›---------- 1 ›ÃÅKU----------2 K?L K?L "K ÃÑKì----------99	
215	u¨Ќ=É Ñ>²= ¾T>ÁÒØS< ›ÅÑ— UM¡„‹ ?¨<mÁKi	›---------- 1 ›ÃÅKU----------2	
216	Ÿ¨þi ¾ƒ—‡ “†¨< Ÿ›”É uLÃ SSKc Ã‰LM	ÅU ?¾ðcd†¨< ÁK< ?“„‹--------1 UØ ¾q¾v†¨< ?“„‹----------2 MÌ S”kdke ŸqS----------3 K?L "K ÃÑKì----------99	

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}.l	ØÁo	›T^à‹	
301	U” ÁIM Mï‹ ulÃ¨ƒ ›K<i	---------- c?ƒ ---------- ·”É	
302	U” ÁIM ?'Ó'“-‹ 'u\i		
303	¾SÚ[h¬” MÏ ŸS¨<KÉi uòƒ Ÿ}²[²\ƒ G<'@?-‹ ÁÑÖS<i ¢K wƒ'Ó]”/Ÿ›”É uLÃ SSKe Ã‰LM/	Tlì”l ¨<eØ ¾V}---- ----------1 u}¨ЌÅ u30 k” ¨<eØ ¾V---------- 2 Ÿ30 k” ?eŸ l ¯Sƒ vK¨< °ÉT@ ¨<eØ ¾V} "K----------3 K?L K?L "K ÃÑKì----------99	
304	¾SÚ[h Mïi e”}— Mïi ”¨<	l----------l 2----------2 3----------3 4----------4 Ÿ5— uLÃ----------5	SMc< ›”Å— ŸJ’ ¨Å 309 kØÃ

		K?L K?L "K ÃÑKì----------99	
305	Ÿ›"É uLÃ Ÿ¨K=É "Ki ŸSÚ[h¨< MÏ uòƒ ÁK<ƒ" ¾ƒ ¨KÉh†¨<	G<K<"U u?ƒ---------- 1 G<K<"U Ö?“ }sU--------- 2 ¾}¨c'<ƒ" u?ƒ ¾}¨c'<ƒ" Ö?“ }sU -------3 K?L K?L "K ÃÑKì----------99	
306	u¨K=É Ñ>²? Ÿ ?Ó'“ Ò` ¾}ÁÁ² ¾Ö?“ ‹Óa‹ ›ÒØVi Á¨nM	›---------- 1 ›ÃÅKU---------- 2	
307	SMc< ›- ŸJ' U" ›Å[Óg	¨Å Ö?“ }sU H@ÉŸ<----------1 ¾vIM l¡U“ ¨cÉŸ←------ 2 ¾MUÉ ›-LÏ ›TŸ`Ÿ<˜ ----- 3 U"U ›L[Ÿ<U----------4 K?L K?L "K ÃÑKì----------99	
308	ŸSÚ[h¨< MÏi uòƒ u'u\i ?Ó'“ ¨pƒ Ö?“ }sU H@Åi ?¨mÁKi	›----------1 ›ÃÅKU----------2	
309	uSÚ[h¨< ?Ó'“ ¨pƒ ¾?Ó'“ ¡ƒƒM 'u[i	›----------1 ›ÃÅKU----------2	SMc< G<K}— ŸJ' ¨Å 313 kØÃ
310	Ÿ'u[g U" ÁIM Ñ>²? H@Éi	1----------1 2----------2 3----------3 4----------4 K?L K?L "K ÃÑKì----------99	
311	u¡ƒƒMi ¨pƒ ¾ƒ S¨KÉ ?"ÇKwi }'Óai 'u`	›----------1 ›ÃÅKU----------2 K?L K?L "K ÃÑKì----------99	
312	SMc< ›- ŸJ' ¾ƒ ?"Éƒ¨MÍ= }'Ñ[i	u?ƒ ¨eØ---------- 1 Ö?“ }sU---------- 2 K?L K?L "K ÃÑKì----------99	
313	¾SÚ[h MÏi" ¾ƒ ¨KÉi	u?ƒ ¨eØ---------- 1 Ö?“ }sU---------- 2 K?L "K ÃÑKì----------99	
314	¾SÚ[h MÏi" eƒ¨MÍ= ¾ƒ S¨KÉ ?"ÇKwi ¾¨c"¨< T" "¨<	?^c?----------1 vKu?,----------2 ÕÅ—Â----------4 K?L ŸK ÃÑKì----------99	
315	¾SÚ[h¨<" MÏ eƒ¨MÍ= U" U" ÁIM e¯ƒ q¾wi	Ÿ12 c›ƒ ¾'u`----------1 Ÿ12 ?eŸ 24 e›ƒ---------2 Ÿ24 e¯ƒ uLÃ----------3 ›Le?¨<eU----------4 K?L "K ÃÑKì----------99	
316	¾SÚ[h MÏi" eƒ¨MÍ= Ÿ?Ó'“ Ò` ¾}ÁÁ² ¾Ö?“ ‹Ó` ›ÒØVi 'u`	›----------1 ›ÃÅKU----------2 K?L "K ÃÑKì----------99	
317	SMc< ›- ŸJ'	¨Å Ö?“ }sU H@ÉŸ<----------1 ¾vIM l¡U“ ¨cÉŸ----------2 ¾MUÉ ›-LÏ ›TŸ`Ÿ<˜ ----- 3 U"U ›L[Ÿ<U----------4 K?L K?L "K ÃÑKì----------99	

ANNEX IX: Field Guide for FGDs and in-depth interview

Field Guide For Focus Group Discussions (FGDs) and in-depth interview

ADDIS ABABA UNIVERSITY
SCHOOL OF PUBLIC HEALTH

Title: Factors affecting the utilization of institutional delivery services in Butajera DSS, Ethiopia, 2013.

Introduction: Maternal mortality is unacceptably high. Most maternal deaths are avoidable, as the health-care solutions to prevent or manage complications are well known. An important component of efforts to reduce health risks to mothers and children is increasing the proportion

of babies that are delivered in health facilities. Ethiopia has one of the lowest utilization of institutional delivery.

Objectives: To assess factors affecting the utilization of institutional delivery services among mothers in Butajera DSS

Procedures to be undertaken during the administration of the sessions:

- Greet and acknowledge all participants for their participation;
- Explain the objective of the study;
- Explain how their responses are recorded;
- Inform them that their participation shall be voluntary;
- Explain that participant responses will be kept confidential and anonymous;
- After getting participants permission start administration of FGDs;
- Record every response using tape recorder and take notes;
- Acknowledge participants and end the session;
- Follow same procedures for each FGD & in-depth interview

Open ended questionnaires for FGDs and in-depth interview

1) In what conditions do mothers in your kebele give birth? (delivery place and attendant)

2) How do culture and tradition affect mother's choice of delivery place?

3) How do you feel about the delivery service in health institution?

4) What difficulties may a pregnant mother face to reach and deliver in health institution?

5) What do the family and neighbors suggest on place of delivery?

6) What should be improved for mothers to deliver in health institution?

7) What is the attitude of the community towards health institution and how do you influence their choice of delivery place? (for community leader & health extension worker)

Annex X. Description of Focus group discussants

Table 9. Focus group discussant's profile in Butajera DSS, Ethiopia, 2013.

Respondent	Sex	Keble	Age	Educational status	Occupation
HR1	M	HOPAE	38	Primary	Merchant
HR2	M	HOPAE	42	No education	Guard
HR3	M	HOPAE	45	No education	Farmer
HR4	M	HOPAE	50	No education	Farmer
HR5	M	HOPAE	46	Primary	Merchant
HR6	M	HOPAE	48	No education	Farmer
HR7	M	HOPAE	53	No education	Farmer
HR8	M	HOPAE	50	No education	Farmer
YR1	M	YITEKER	27	Primary	Merchant
YR2	M	YITEKER	35	Primary	Merchant
YR3	M	YITEKER	48	No education	Farmer
YR4	M	YITEKER	50	Primary	Guard
YR5	M	YITEKER	45	No education	Farmer
YR6	M	YITEKER	27	Secondary	Merchant
YR7	M	YITEKER	53	No education	Farmer
YR8	M	YITEKER	46	No education	Farmer
DR1	F	DOBENA	25	Primary	Housewife
DR2	F	DOBENA	30	No education	Housewife

DR3	F	DOBENA	26	No education	Merchant
DR4	F	DOBENA	28	No education	Housewife
DR5	F	DOBENA	32	No education	Housewife
DR6	F	DOBENA	26	No education	Housewife
DR7	F	DOBENA	28	No education	Housewife
WR1	F	WURIP	30	No education	Housewife
WR2	F	WURIP	27	No education	Housewife
WR3	F	WURIP	28	No education	Housewife
WR4	F	WURIP	35	No education	Housewife
WR5	F	WURIP	23	Primary	Housewife
WR6	F	WURIP	26	No education	Merchant
WR7	F	WURIP	24	Primary	Merchant
WR8	F	WURIP	32	No education	Housewife

ANNEX XI. Qualitative analysis of the result.

Table 10: Themes, categories and codes of the FGD and in-depth interview done in the five rural kebeles of Butajera DSS, 2013.

Themes	**Categories**	**Codes**
A. Views about delivery service	cultural views & Changing traditional ways	Earlier habit, Home with God, Faith Helping each other, Elderly advice Traditional rituals , Previous difficulties, Change in attitude
	Appropriateness of home delivery	Home at ease, Hesitating to go Celebrating home birth, Easy labour managed at home
	Situations to seek IDS	Easy labour managed at home, Prolonged labour, Primi at risk, Depends on the labour, Last option
	Comforting TBA	Experienced TBA, Paying in item,

		Considerate , TBA's service at home, Pay in item, Conflict of interest
B. Barriers related to service in health institution	Inadequate service	Option of referral, Not 24 hrs Preferring higher institution
	Unaccepted ways of delivery	Rush to procedures, Despise surgical procedures, Alone to labour
	Confusion about cost of IDS	Financial difference, Charge free Various cost
	Petrified of health professionals	Unprofessional Unqualified attendants, Mistreat, Misconceiving HEW Unethical health professionals
	Resistant attitudes	Sense of unbelief, Looking for reasons
	Losing the support system	Keeping family away, Without support system