ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF THE EFFECT OF FOCUSED ANTENATAL CARE ON UTILIZATION OF SKILLED DELIVERY ATTENDANT AT BIRTH AMONG MOTHERS IN GOMMA WOREDA AND AGARO TOWN

BY

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DECLARATION

I, the undersigned, declare that this thesis is my original work in partial fulfillment of the requirement for Degree of Public Health and has not been presented for a degree in this or any other university. All source of materials used for this thesis have been duly acknowledged.

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The thesis has been submitted for School of Public Health/AAU with my approval as the university advisor.

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Acronyms

ANC	Antenatal Care
CBRHA	Community Based Reproductive Health Agent
CI	Confidence Interval
EDHS	Ethiopian Demographic Health Survey
EPi-info	Epidemiological information
FANC	Focused Antenatal Care
FMOH	Federal Ministry of Health
HC	Health Center
HEW	Health Extension Worker
HIV	Human Immuno-deficiency virus
HMIS	Health Management Information System
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MRN	Medical Record Number
OR	Odds Ratio
PNC	Post natal Care
SBA	Skilled Birth Attendant
SD	Standard Deviation
SDA	Skilled Delivery Attendant
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization
ZHO	Zonal Health Office

Abstract

Background: There should be a link between use of antenatal care and delivery assisted by a professional health care provider. Ethiopia is ranked among the nations with the highest maternal mortality ratios in the world. The effect of packaged health care services in Focused Antenatal Care that a mother receives during pregnancy, at the time of delivery and soon after delivery is important for the survival and well-being of both the mother and the new born.

Objectives: To assess the effect of Focused Antenatal Care on Skilled Delivery service Utilization at birth among women who have attended FANC in Health centers and deliver in the one year preceding the survey in Gomma Woreda and Agaro Town,Jimma Zone, Oromia National Regional state, south west Ethiopia.

Methods: a community based comparative cross sectional survey was conducted among mothers who have attended 1-3(none exposed) and ≥4(exposed) FANC at Health centers and delivered one year preceding to the study period in Gomma woreda and Agaro Town. A total number of 369 mothers that attended FANC were selected with systematic random sampling technique from Health centers' ANC registration book based on the number of FANC .Then selected mothers were traced and interviewed. The association of FANC visits and other factors with outcomes (skilled delivery attendant utilization) was assessed using Chi-square ($\chi 2$)-statistics and multivariate logistic regression models and to control confounders. Place of delivery was divided into home delivery or facility delivery.

Results: The study results showed that the magnitude of skilled birth attendant service utilization at birth among FANC visitors was 53.1% in the study area. Utilization of SDA among ≥4 FANC attendants was 68.5% and 48.0% among 1-3 FANC visit attendants. Maternal education, religion, living in a distance of 30 minutes' walk to nearest health facility with SDA, preference of husbands' as place of delivery for their wives and birth preparedness and complication readiness plan implementation was significantly associated with utilization of SDA at birth among FANC attending mothers.

Conclusions: The magnitude of deliveries attended by skilled birth attendant was relatively high among ≥4 FANC attendant mothers but there was no statistical difference between 1-3 and ≥4 FANC attendants in utilization of skilled delivery attendant care at birth. So, enable pregnant mothers to attend their ANC followup with skilled providers.

Recommendations: To make FANC service effective in getting back mothers to utilize skilled delivery attendant during delivery, emphasize on individualized service provided to pregnant mothers attending FANC not on number of visits she should attend, implement all packages of FANC services, birth preparedness and complication readiness should have to get equal attention as other packages, involve husbands/partners at least once during FANC visit, provide free-cost emergency transportation for distant mothers during labor, enable women to attend formal education at least up to secondary education, community mobilization and involving religion leaders in Skilled birth attendant service utilization promotion activities were recommended.

1. Introduction

1.1 Background

Delivery by SBAs serves as an indicator of achieving progress towards reducing maternal mortality worldwide, the fifth Millennium Development Goal [1].According to the most recent World Health Organization (WHO) analysis, most maternal deaths in Africa are related to direct obstetric complications that occur around the time of childbirth—mainly hemorrhage, hypertension, sepsis, and obstructed labor, all together account for 64% of all maternal deaths [2].The type of assistance a woman receives during this time has important health consequences for both mother and child. However, there were an estimated 287 000 maternal deaths, yielding a MMR of 210 maternal deaths per 100 000 live births among the 180 countries that were covered in 2012 maternal death estimate study. Developing countries account for 99% (284 000) of the global maternal deaths, the majority of which are in sub-Saharan Africa (162 000) and Southern Asia (83 000). These two regions accounted for 85% of global burden, with sub-Saharan Africa alone accounting for 56%. As a result, the overall aim of MDG 5 (a 75% reduction) is unlikely to be achieved by 2015 [1].

In many countries where pregnant women receive care from skilled attendants, various types of health professionals (accredited midwives, nurse-midwives, doctors and nurses with midwifery skills and specialist obstetricians) are known to be fulfilling the role of the skilled attendant. At the community level, the skilled attendant will often be the only qualified and accredited health care worker with exclusive responsibility for the care of women during pregnancy, childbirth and the immediate postnatal period. Certainly, others — ranging from traditional birth attendants, nurse to specialist physicians — will contribute to the care of women and newborns [3].

Studies that focused on maternal mortality and morbidity in developing countries have repeatedly emphasized the need for antenatal care and availability of trained personnel to attend women in labor and delivery [4].In sub-Saharan Africa, many more women attend antenatal care clinics than seek skilled attendants' delivery services, although the magnitude of this differential varies from country to country and regionally within border areas of countries. Even among women who have formal interactions with the healthcare system through antenatal care-seeking, a significant sub-set still delivers without adequate obstetric care [5].

Focused Antenatal Care ;-Care routinely provided to all pregnant women from screening to intensive life support provided to any woman while pregnant and up to delivery. “Having one or more visits with a trained person during the pregnancy” to detect early signs of disease or risk factors and timely intervention. WHO recommends four antenatal care visits for women whose pregnancies are progressing normally. Each visit should include a care that is appropriate to the woman’s overall condition and gestational age of the pregnancy, and help her prepare for birth and care of the new born. If problem or potential problems that will affect the pregnancy and new born are detected, the frequency and scope of visits are increased. Generally focused antenatal care visits include the intervention like:-

1.Health promotions and diseases prevention (Tetanus toxoid prophylaxis, Iron and folate supplementation, Presumptive treatment for hookworm, Iodine supplementation, Recognition of danger signs during pregnancy and labor and appropriate action to be taken, Importance of good nutrition, Risk of alcoholism and substance abuse and Adequate rest during pregnancy), **2**.Early detection and treatment of complications and existing diseases (such as HIV, syphilis and other sexual transmitted infections ,malaria, tuberculosis, malnutrition and severe anemia, vaginal bleeding, hypertensive disorders, malpositions after 36 weeks, and fetal distress) and

3. Birth preparedness and complication readiness (A skill provider to be present at the birth, The place of delivery and how to get there, Items needed for delivery, Need to save money in order to meet financial commitments/bills during childbirth, Support during and after childbirth, A person designated to make decision on her behalf, A way to communicate with a source of help, A source of emergency funds, Emergency transportation, Blood donors) [6].

This integrated approach is expected to have high effect on important issues affecting the woman’s health, her pregnancy and her plans for childbirth and the post partum and newborn care; and preparedness for child birth by pregnant woman and her family, such as selecting a birth location and identifying a skilled attendant. Therefore, the effect of these packaged health care services that a mother receives during pregnancy, at the time of delivery and soon after delivery is important for the survival and well-being of both the mother and the newborn [7].

The Government of Ethiopia is committed to achieving Millennium Development Goal 5 (MDG5), to improve maternal health, with a target of reducing the maternal mortality ratio (MMR) by three-quarters over the period 1990 to 2015. However, each year 20,000 women die

from complications of pregnancy and child birth with many more maternal morbidities occurring for each maternal death [8] even if the proportion of births attended by skilled providers is a measure of the health system's effectiveness, accessibility, and quality of care [9]. HEWs brought improvement in utilization of family planning, ANC and HIV testing but not in assisting births. Health posts were rarely used by women for delivery services and PNC checkups. Only very few number of mothers gave birth at health posts in a study done in Tigry Region [10].EDHS2011 also strengthened this fact ,MMR 676 per 100,000 live birth MMR with no significant different from EDHS 2005 that has showed 673 per 100,000 live birth[7,9].

A key factor contributing to both high maternal and newborn mortality is the low rate of skilled care during pregnancy and delivery [11]. Therefore, Delivery assisted by skilled providers is the most important intervention in reducing maternal mortality and one of the MDG indicators to track national effort towards safe motherhood [9].

Several factors have been mentioned in different studies that influence institutional Delivery. Out of them, Knowledge of the mothers about pregnancy and delivery related services, advantages of these services, pregnancy and delivery related complications and mothers susceptible to these complications was found to be significantly associated with delivery service utilization[12]. ANC services can provide opportunities for health workers to promote a specific place of delivery or give women information on the status of their pregnancy which in turn alerts them to decide where to deliver [13] to be assessed for possible risks and also to be educated on use of maternal health care services. Women who had at least four ANC visits were more likely to deliver under the care of SBAs than those who had attended none or less than four visits [14].

1.2 Statement of the problem

Globally, there were an estimated 287 000 maternal deaths in 2010, yielding a MMR of 210 maternal deaths per 100 000 live births among the 180 countries that were covered in trends of WHO maternal mortality analysis of 1990 to 2010. Developing countries account for 99% (284 000) of the global maternal deaths the majority of which are in sub-Saharan Africa (162 000) and Southern Asia (83 000). These two regions accounted for 85% of global burden, with sub-Saharan Africa alone accounting for 56%. The MMR in developing regions (240) was 15 times higher than in developed regions [8].

In sub-Saharan Africa, the levels for antenatal care use are consistently higher than the levels for skilled attendant at delivery. This would appear to indicate that antenatal care is less effective in sub-Saharan Africa in getting women to use skilled attendance at delivery [18].This can be one of the reason to scored the highest MMR at 500 maternal deaths per 100 000 live births in trends of maternal mortality 1990 to 2010, while Eastern Asia had the lowest among MDG developing regions at 37 maternal deaths per 100 000 live births. As a result the adult lifetime risk of maternal mortality in women from sub-Saharan Africa was the highest at 1 in 39, in contrast to 1 in 130 in Oceania, 1 in 160 in Southern Asia,1 in 290 in South-eastern Asia and 1 in 3800 among women in developed countries [8].

In 2005, the Federal Ministry of Health of Ethiopia stipulated a package of free maternity and selected child health services. However, proportion of deliveries in health institution (skilled delivery attendant utilization) is still low even among prenatal users' though prenatal service utilization was mentioned as strong predictor of safe delivery service utilization in cross-sectional studies in different parts of Ethiopia among women who had at least one registered prenatal visit, four times likely to utilize the service than those who did not [12,13].

While Ethiopia has made significant progress in reducing maternal mortality over the past two decades, it is consistently ranked among the nations with the highest maternal mortality ratios (MMR) in the world [19]. As already stated in recent Ethiopian's DHS 2011 there was high MMR at 676 maternal death per 100,000 live birth and for ANC visit 1-3 and 4+ there was 14.4 % and 34.3% institutional delivery service utilization that were attended by skilled professionals

[9]. In Arsi zone, south-east Ethiopia regarding maternal health service utilization, 75.5% of urban and 52.2% of rural had at least one prenatal visit during their last pregnancy. Among those women who attended ANC 42.6 % have made 4 and more visits and 69.7% of the respondents reported that they received health education during their ANC visits. Out of those who said they have received health education during their ANC visit 66.4 % were informed about the danger signs related to pregnancy, and 75.0% about the place of delivery. Out of 1074 studied subject's 59.9% had received ANC at least once at more four and above but only 25.2% of them delivered in health institution [20].

In a community - based cross sectional study among mothers who gave birth in the last 12 months in sekela district, north west of Ethiopia; out of women who had 1-3 ANC visits only 16% and out of ≥4 visit 26.8% were received skilled delivery service [12].In similar study done in Benshangul Gumz Region Metekel zone 20.9% of ANC attendant delivered in health institution [4].

In Gomma woreda and Agaro Town the magnitude of skilled birth attendant service utilization among ANC attendees and factors affecting it was not known. If unless otherwise the effect of Antenatal care given by professional (FANC) in improving skilled delivery service utilization was studied and measures are taken, mothers cannot obtain professional care at delivery, proper medical attention and hygienic conditions during delivery that a mother should get` to reduce the risk of complications and infections that may cause the death or serious illness of the mother and the baby or both will not attained even among ANC users.

On the other hand, since the magnitude of deliveries by skilled delivery attendant and associations of FANC visits and SDA utilization were not known among FANC visitors in the study area, made the study worthwhile and urgent because it has been intended to assess these problems as specific objectives.

The result of this study will provide valuable information to link FANC and SDA for improving maternal and newborn health in the study area and other areas with same socio-cultural and demographic setup.

1.3 Rationale of the study

In Ethiopia 20,000 women die each year from complications of pregnancy and child birth with many more maternal morbidities occurring for each maternal death [15]. In a study of Ethiopia's Hospitals on Quality of Care for Prevention and Management of Common Maternal and Newborn Complications, the ANC providers' provision of preventive treatments was considerably better than on the other two categories of FANC (i.e., health promotion 19% and birth preparation counseling 24%), which both require interaction with the client. However, fewer than 40% of ANC clients observed received each of the three sets of focused ANC services assessed [16].

The quality of antenatal care (ANC) can be measured by the qualifications of the provider and the number and frequency of ANC visits. Antenatal care quality can also be monitored through the content of services received and the kinds of information given to women during their visits. These services raise awareness of the danger signs during pregnancy, delivery, and the postnatal period. They also improve the health-seeking behavior of the client, orient the client to birth preparedness issues, and provide basic preventive and therapeutic care [9]. Involving the use of professional attendants at delivery, have reduced maternal mortality ratios to 50 or less per 100 000 [17] but currently at the study area though women use FANC, many of them do not get professional care at delivery.

Therefore, this study was aimed to assess the effect of the number of FANC visit on uptake of health facility delivery through comparative cross-sectional community based survey among mothers who have been attended 1-3 and ≥4 FANC visits at Health centers and gave birth in one year prior to the study period. As per principal investigator knowledge; the magnitude of antenatal care attendees who used skilled attendance at the time of delivery, factors affecting it and the associations of FANC visit number and SDA utilization among ANC attendees in Jimma Zone, Gomma woreda and Agaro Town was not known. The result of this study will provide information on the proportion of deliveries conducted by skilled delivery attendant and factors which influence the utilization of SDA and the association of ANC visit and SDA utilization among FANC attendees. Planners, implementers, and policy makers and above all women in the study area and other areas with similar setup will be benefited.

2. Literature Review

A skilled attendant is an accredited health professional — such as a Midwife, Doctor or Nurse — who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns[3].

2.1 Maternal mortality

Worldwide, in 2010, there were an estimated 287,000 maternal deaths, yielding a global MMR of 210 maternal deaths per 100,000 live births, down from 400 maternal deaths per 100,000 live births in 1990.In 2010, MMR in low-income countries (410) was 88 times higher than in high-income countries (14) and 16 times higher than in middle-income countries (230) [21].

2.2 Frequency of ANC visits and skilled delivery attendant utilization

According to WHO, in developing country the relationship between four or more antenatal care visits and delivering in a medical facility – hospital, health centre or clinic is more pronounced. Women reporting at least four antenatal care visits were on average 3.3 times more likely to deliver in a medical facility than other women. The difference between the two groups of women is especially large in Bangladesh and Ethiopia, both countries with low overall levels of antenatal care use [18]. A population based study in Bangladesh shows women receiving more ANC visits were more likely to seek facility-based delivery care and the relationship between antenatal care visits and facility delivery has significant association between ANC visits and facility delivery observed. Facility delivery among women attending 3 or more ANC visits in comparison to women with 0 or 1 ANC were 3.25 and 2.74, respectively [22].

As indicated in analysis of trends, levels and differentials of ANC in developing country WHO 2003, there should be a consistent link between use of antenatal care and delivery assisted by a professional health care provider – doctor, nurse or midwife. Women reporting four or more antenatal visits are far more likely to have given birth with professional assistance than women reporting fewer visits. This is particularly the case in countries where the overall level of antenatal care use is low. Across all developing countries, skilled professional assistance at delivery is six times more common for women who had at least one antenatal care visit than for women who had none, and three times more common for women who had four or more visits than for women who had fewer visits [14,18,].

In the three consecutive Ethiopia's DHS (EDHS 2000, EDHS 2005 and EDHS 2011) there were 27%, 28% and 34% percent of women who gave birth in the five years preceding each survey received antenatal care from a skilled provider, that is, from a doctor, nurse, or midwife, for their most recent birth. Similarly there are 7.4, 8.3, and 14.4 percent of institutional delivery to women who made one to three visits and 27.2, 30.6 and 34.3 percent of institutional delivery to women who made four or more visits for the three respective EDHSs. This is a marked improvement from time to time though the proportions of births attended by skilled personnel are very much lower than SSA. Even for women who have access to the services, the proportion of births occurring in health facilities is very low. Only 6% of births were delivered in health facilities and, there is no significant difference in proportions of delivery service utilization between EDHS 2000 and 2005; however this figure moderately increased to 10% in EDHS 2011[7,9,23,]. Frequency of ANC Visit also makes difference in utilization of SDA among ANC visitors. Utilization of health service for SDA is 3.25 times more among 3^{+} ANC visitors than 0 or 1 and 2 ANC visitors in one non-governmental Facility service area and 2.7times more than 0 and 1 and 2 ANC Visitors in Government service area in Bangladesh [22].In Uganda 4^{+} ANC visitors utilize SDA 2.2 times more than <4 ANC visitors [14].In North west Ethiopia 4^{+} ANC visitors utilize SDA 7.3 times more than 1 and 2-3 ANC visitors.[12].

2.3 Goal-Oriented Interventions in Focused Antenatal Care

Women who obtained maternal health information were two times more likely to utilize skilled delivery attendant in northern Ethiopia, Mekele Town [24].Goal-directed interventions give a framework for effective antenatal care and skilled delivery. These include: (1) Care from a skilled birth attendant and continuim of care.(2) Detection and early treatment of conditions that could severely affect maternal and fetal well-being.(3) Preventive interventions .(4) Counseling and health promotion. (5) Preparation for childbirth and complication readiness. But the implementation of focused antenatal care is far from being feasible in developing countries, for many reasons, like difficulty in changing the status quo in current medical practice (old habits die hard); from traditional practice of routine ANC to the practice of focused ANC [25].

2.4 Factors associated with SDA service provision at Birth in Health Facility.

It is possible that healthcare providers are failing to adequately use antenatal care as an opportunity to encourage women to deliver at their healthcare facilities because antenatal care is not yet meeting its potential to serve as an entry into the healthcare system at the time of delivery [5].

Finding from Arsi zone, south-east Ethiopia shows**,** Out of the total women who delivered their last child at health institution, 78.4% paid for the service and out of these 16.7% them complained that the payment was too expensive, Fifty one (29.0%) said they waited for long time before receiving the service and (13.0%) said the health worker were not respectful, 26 (14.8%) of them were not satisfied with the service they received. They also complained about the distance to the health institution from their residence, 33.4% of respondnts had walked more than 2 hours to reach the nearest health facility [20] .Concerning the payment the FMOH Healthcare Financing Proclamation requires maternity services to be provided free of charge, however in public and private health centers providing delivery services, 66% charged a fee for normal delivery or required women to buy supplies for their delivery, including essential medicines [19].

Even though ANC services can provide opportunities for health workers to promote a specific place of delivery or give women information on the status of their pregnancy which in turn alerts them to decide where to deliver [13], studies done in different part of Ethiopia has revealed that the level of ANC service utilization is relatively higher but the utilizations of professional assisted delivery care and PNC among the study population was very low, there were about 77.4 percent ANC attendant in southern part of Ethiopia[28]. In similar cross sectional study in west Gojam sekela district very low (12.1%) institutional delivery service utilization was observed in the study area though 66.8% of the mothers attended ANC services during their last pregnancy [12].

2.5 Factors Associated with SDA service utilization at community level

Focused birth preparedness by pregnant women is necessary to encourage every woman to have birth at health facility or assisted by health professionals. It is advisable for HEWs and other community health workers to have effective discussion on birth preparedness with every pregnant woman when they do home based ANC visit [10]. Low awareness about the benefits of modern health care services in the community, distance, inaccessibility of services and poverty

were mentioned as important factors for low utilization of maternity care services. Since the influence of cultural beliefs is still strong in rural areas, rural women are forced to visit health institutions for maternity care services when they face complicated labour and when they feel sick. Although most women in urban areas give birth in health institutions, there are few urban women still influenced by their mothers or elderly relatives. Hence, they prefer to give birth at home with the help of traditional birth attendants [26].

2.6 Factors Associated with SDA service utilization at individual level.

2.6.1 Socio-demographic factors

In general population ;age of the mother, occupational status of the mother, educational status of the mother, monthly income,place of residence of the mother, husband's educational and occupational status were the factors found to be significantly associated with institutional delivery service utilization. Mothers with age group of 15–24 years were 4 times more likely to deliver in health institutions than mothers with age group 35 and above. Mothers with educational level of secondary and above were also more likely to give birth in health facilities than those with primary education and below. Rural women were found to be less likely to give birth at health facilities than their urban counterparts. Regarding the educational status of husbands, mothers whose husband attended secondary school and above were more likely to deliver at health institutions as compared to mothers whose husbands were unable to read and write. [12-14,27-29, 30]. Therefore, the consequences of disadvantages in terms of social and economic support on the overall ANC attendance and - even more importantly - for delivering with skilled attendance and postnatal care among mothers for themselves and their child needs to be further investigated [31].

2.6.2 Obstetric characteristics

Women who receive regular antenatal care are far more likely to give birth with a skilled health attendant and are better able to recognize the signs of complications before, during and after delivery. Yet antenatal care coverage in Africa remains very low. Overall, about 79 per cent of pregnant African women attend at least one antenatal check-up, but fewer than half of pregnant women in Africa attend the recommended four [32].In sub-Saharan Africa, unexpectedly, the levels for antenatal care use are consistently higher than the levels for skilled attendant at

delivery. This would appear to indicate that antenatal care is less effective in sub-Saharan Africa in getting women to use skilled attendance at delivery. There are many possible reasons for this [18].

In Uganda Women who had their first antenatal clinic visit with a gestation age of 1–3 months were more likely to choose assistance of skilled birth attendant than those who had their first ANC visit at gestation age of 4 months or above (OR 1.4, 95% CI: 1.0–1.9). Those women who attended ANC 4 times or more were more likely to choose assistance by skilled birth attendant at the time of delivery than those who had less than four ANC visits (OR 2.2, 95% CI: 1.5– 3.1). [14]. In retrospective review study conducted in one of Kenyan's Health center, from antenatal care and maternity registers aimed to estimate the use of skilled attendants' delivery services among users of antenatal care and the coverage of skilled attendants' delivery services in the general population of Kikoneni location, assumed that all the women who gave birth at the Health Center had attended the antenatal clinic there at least once, they calculated that only 7.4% (74 of 994) of antenatal patients used skilled attendants at delivery [5].

In cross sectional studies in north Gonder and in Munisa Woreda south East Ethiopia that showed poor utilization of maternity care (antenatal care and safe delivery service) in general and from ANC attendees only 29% and 35%) get skilled birth attendant assistant at delivery respectively [27,13].Antenatal care service utilization increased the likelihood of institutional delivery by four times in the study done in Benshangul Gumz which was in line with the finding in north Gonder and south east of Ethiopia Munisa Woreda [4,13,27].

Mothers go for institutional delivery if the labour is complicated. Intra-partum complication, other than knowledge of respondents', ethnicity, prenatal utilization service and decision making on place of delivery were also identified as factors affecting safe delivery service utilization in Benshangul [4]. Utilization of safe delivery services was about five times higher in north Gonder among those who previously had developed one of the life threatening obstetric complications (OR = 4.7, 95% CI: 2.41, 9.12). This implies that significant proportions of mothers seek help from skilled birth attendants after developing obstetric complications and when other traditional interventions fail [27].

The lower coverage for delivery and postnatal care has also often been attributable to the unpredictability in the onset of labor and the difficulty of travel, particularly for long distances, during labor, during delivery, and even within a few days after delivery [13, 30] and as birth order increased the chance of giving birth at health institution decreased, implying that mothers tend to seek modern obstetric care for their first pregnancy than for the subsequent pregnancies [27].

2.6.3 Women decision making power

Household decision autonomy had also significant influence on the likelihood of a woman to receive both delivery and postnatal care services, women with high household decision autonomy are more likely to seek delivery (11.3%) and postnatal care (10.9%) services **[26].** The patterns of decision making power within the household were perceived as key determinants of the place of delivery. Mothers who decide to use modern health service and place of delivery by themselves were more likely to give birth at health facilities (OR 1.76, 95%CI= 1.06-2.93) and (OR 1.90, 95%CI=1.12-3.23) respectively than mothers who could not decide by themselves **[34].**

2.6.4 Knowledge of Mothers'

Knowledge of the mothers about pregnancy and delivery related services, advantages of these services, pregnancy and delivery related complications and mothers susceptible to these complications was found to be significantly associated with delivery service utilization. Mothers who had good knowledge were about three times more likely to deliver in health institutions than mothers who had poor knowledge [12]. Mothers' knowledge about save delivery increased utilization of save delivery by more than four times [4]. Institutional delivery service was significantly influenced by the level of education. Women with higher level of education (secondary and above) were about 4.3 times more likely to deliver at health facilities than those who were unable to read and write [13].

2.6.5 Belief, attitude and perception of women about skilled attendant utilization

Reasons given for home delivery includes; short labor, usual practice, feeling of more comfortable just being at home, close attention from relatives & family members, to exercise cultural values, not liking health facility and other reasons. Reasons given for institutional

delivery were :- better service in health facility, better outcomes from Institutional delivery, informed to deliver in Health Facility, close to where they live, Poor out comes from home delivery and Others [24,26,30].

2.6.6 Accessibility to Health Service

The availability of skilled attendant, accessibility of health institutions and the presence of referral system are some factors that enable mothers to utilize skilled attendant care [24]. Women who lived within a radius of 5 kilometers to the nearest health facility providing maternal health and delivery services were 39% (AOR=0.61, 95%CI [0.41, 0.90]) less likely to deliver at home compared to those who lived more than 5 km away[**33**]. Similarly in North West Ethiopia, north Ethiopia and Uganda place of residence was strongly associated with institutional delivery service utilization. Mothers who lived in urban areas were two to five times more likely to deliver in health facilities than those who live in Rural Kebeles [12-14, 27]. Women who have been living in areas more than an hour's walking distance were nearly 50% less likely to utilize health service with (OR 0.52, 95%CI=0.30-0.90). Moreover, women who had use modern health service were nearly six times to utilize safe delivery service (OR 5.75, 95%CI=1.76-18.78) compared to women who did not ever use modern health service [34].

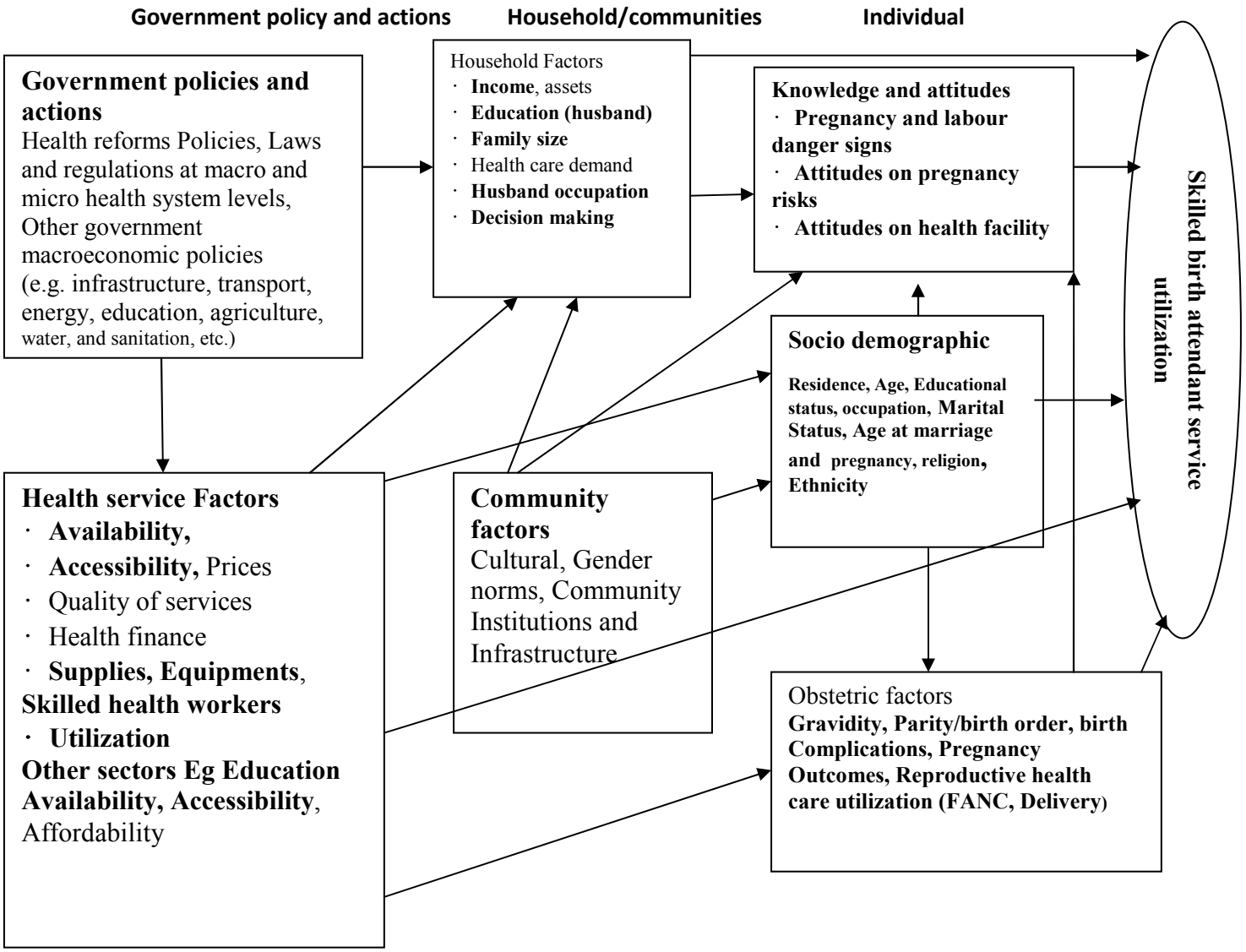
In Oromia region Institutional delivery service utilization was about 4.3% in EDHS 2005 which in turn was lower than the national level,6%, and SBA was 4.8%.There was 24.8% ANC attendant in the region [7]. In EDHS 2011 skilled ANC has increased to 31.4%.Institutional delivery and SDA utilization have also increased to 8% and 8.2% respectively [9]. Institutional delivery and skilled birth attendant utilization among 1-3 and ≥4 ANC visitors is not known at regional leve and in the study area also.

According to EDHS-2011 the reasons given by the region's women not to deliver in health facility were cost too much(2.3%),facility not open(1.2%),too far/no transportation(18.3%),poor quality service (0.6%) no female provider(0.1%),husband/family did not allow (1.6%),not necessary (63.3%),not customary(28.9%) and other (4%)[9].

Literatures assess intensively factors affecting SDA utilization, proportion of ANC follower versus non user and skilled delivery utilization in general population. But there was gaps in assessing the effect of ANC follow up in improving proportion of SDA utilization, as individual

study topic. So it was very urgent to assess effect of skilled ANC provided at health centers on skilled Delivery attendant utilization at birth and factors associated with it. Currently there is good health services coverage which equipped with necessary man power (Health officers, Nurses and Midwives) that can provide FANC and skilled Delivery service to all pregnant women visiting the Health centers and to those referred from Health extension workers in Oromia Region as well in Jimma Zone. These inputs and process have to bring meaningful utilization of maternity services among mothers.

2.7 Conceptual framework to analyze determinants of skilled delivery attendant service utilization



3. Objective

3.1 General objective

To assess the effect of focused Antenatal care visit on utilization of skilled birth attendant service, among mothers who have attended FANC and gave birth in the one year preceding the survey in Gomma woreda and Agaro Town.

3.2 Specific objectives

1. To determine the magnitude of deliveries by skilled birth attendants among mothers who have attended FANC and gave birth in the one year preceding the survey.
2. To assess factors associated with utilization of SBAs among mothers who have attended FANC and gave birth in the one year preceding the survey

4. Methods and materials

4.1 Study design

The study was quantitative study method in the form of community based comparative cross-sectional survey among mothers who have attended 1-3 and 4 and above FANC and gave birth in the one year preceding the survey.

4.2 Study period

Study period was from December 2012 to June 2013.

4.3 Study area

The study was conducted in oromia region, Jimma zone Gomma woreda and Agaro town, located 395km south-west from Addis Ababa. There were 41 kebeles (3 towns, 2 camps and 36 rural kebeles) and 5 kebeles, in Gomma woreda and Agaro Town respectively. Gomma woreda is the third large out of 18 woredas in jimma zone and Agaro is the only big town in the zone next to Jimma Town. The 2012/13 projected population of Gomma Woreda is 251,004 and Agaro Town's is 31707 according to 2007 census result. Agaro town is the administrative center for Gomma woreda and Agaro Health center which is an older Health center in the area servicing both Agaro Town residents and Gomma woreda residents though it is under Agaro Town administratively. Currently Gomma has seven functional health centers (Limmu shaye HC, Gembe HC, Choche HC,Beshasha HC,Yachi HC,Chego HC and Botto HC) and three developing Health centers[35,36]. Agaro Town has two health centers, Agaro Health center and Wolda Health Center. There is 7 private clinics In Gomma woreda and 5 in Agaro Town but none of them did not provide skilled delivery care for mothers. Potential Health service coverage of Gomma woreda is 70% and Agaro Town's is 100% in 2012. Jimma university specialized Hospital receive all referral obstetrics cases from these health centers. All Health centers have staffed with Health officers, Nurses and midwifes that could provide FANC daily 8 hour on the five working days and 24 hour delivery care services throughout the week [35, 36].

There were 197 different level health professionals in Gomma woreda and [35] and 54 in Agaro Town [36]. In addition, 36 health posts were found with a total of 74 rural Health Extension Workers (HEWs) in Gomma woreda [35].Even though health extension workers were trained on "safe and clean delivery" and provide ANC and manage non-complicated delivery care, they

were not considered as skilled birth attendant based on the current policy of the country. They identify and make timely referral of pregnant mothers with pregnancy problem for FANC and complicated labour to HC. As Gomma woreda Health office 2011/2012 Annual report there were 9087 expected pregnancy in the woreda, of these ANC 1st and 4th given by HCs were 6085 and 1517, Delivery attended in HCs were 412. Similarly, in 2011/12 Agaro Town Health office reported that there were 1223 expected pregnancy, 1052 pregnant mothers attended 1st ANC visit and 580 deliveries were attended at health center [37, 38].

4.4 Source population

All mothers in reproductive age (15-49 years) residing in the study area.

4.5 Study population

Sample of all women who have attended FANC in Health centers for their last pregnancy and gave birth in the one year, 1/07/2004 to 30/06/2005 E.c, preceding the survey irrespective of place and outcome of delivery were included in the study.

4.6 Inclusion criteria

- Women, who have attended FANC in Health centers for their last pregnancy and gave birth in the one year preceding the survey irrespective of place and outcome of delivery
- Women, who were residing in the study area at the time of survey.

4.7 Exclusion criteria

- Women, who were not mentally and physically capable of being interviewed.
- Women, who were out of the catchment of the Health centers.

4.8 Sample size Determination

The sample size was determined using open Epi Info version **3.5.3** statistical packages and based on the following assumptions: 14% for proportion of women who have attended 1-3 ANC visits utilized skilled delivery service [P1] and 34% for proportion of women who have attended ≥4ANC visit utilized skilled delivery service (P2) [9] and with assumption of 3:1 ratio of n1 to n2, type I error of 5%, power of 80%, non-response rate 10% and design effect of 1.5. As a result, a sample size of 369 was calculated, 92 for ≥4 FANC visitors and 277 for 1-3 FANC visitors.

$$n_1 = \frac{[z_{\alpha/2}*SQT(1+1/r)*p(1-p)]+z_{\beta}*SQT(p_1(1-p_1)+p_2(1-p_2)/r]^2}{(p_1-p_2)^2}$$

Where:

n=required minimum sample size for the two groups=n_1+n_2 P1=Proportion utilized SDA among 1_3 FANC visitors

P2=Proportion utilized SDA among ≥4FANC visitors P=Pooled proportion

$Z\alpha/2$=1.96 at 95% level of significance Z_{β}= 0.84 for 80% power of the test

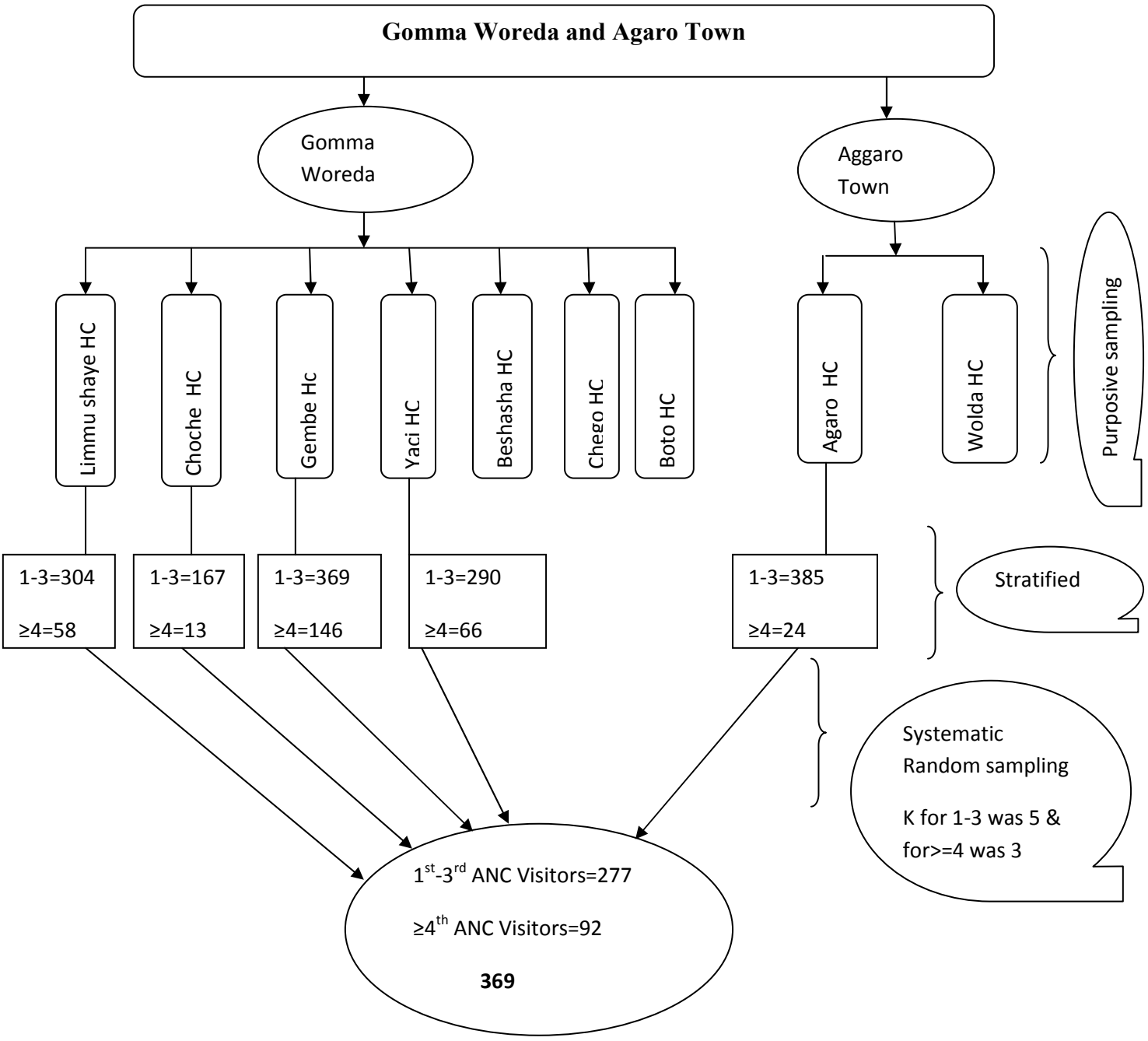
r=proportion of group 1 to group 2

4.9 Sampling procedure

Gomma Woreda and Agaro Town were selected for this study purposefully because of their accessibility considering time and resource that had been allocated for this project. Out of the total 9 Functional Health centers in the study area, 4 of them (Chego HC,Beshasha and Boto HC from Gomma woreda and Wolda HC froma Agaro Town) were excluded since they started service in 2011/ 2012 and their catchment kebeles were previously under those selected HCs.

In each selected Health center, from Antenatal care Registration Book Medical Record Number (MRN) of ANC clients who have attended 1st visit, 2nd visit and 3rd visit but were expected to deliver in the last 12 month before the survey were listed as one population group and those who had 4 and above visits and were expected to deliver in the last 12 month were listed as separate sampling frame for both groups. Based on MRN of FANC attendants, name and address of mothers' were retrieved from Health management information system (HMIS) folder.Those mothers whose address was out of the health centers' catchement and and those leved in far kebeles were excluded. Knowing number of ANC clients who have had 1-3 ANC visits and 4 and above visits, allocation of sample size was in the ratio of 3:1, since the1st-3rd ANC visitors client were large in number, and proportional to the size of their clients in each HC. Systematic random sampling was applied on listed name of mothers to identify the required study subjects in both groups that would be traced and intervied. To made convenience for data collection, listing was made according to their respective kebeles.

Fig 1. Sampling procedure scheme:



4.10 Data collection procedures

A face to face interview was conducted by pretested structured questionnaire. The questionnaire was adapted from DHS and related thesis works after reviewing relevant literature according to the objectives of the study. The English version of the questionnaire was translated in to Afan Oromo for better understanding by the data collectors and respondents. Consistency was checked by translating the Afan Oromo version back to English by another individual fluent in both languages.

Data collectors were 12 health extension workers allocated from each neighbor kebeles to surveyed ones. Four Supervisors and Principal investigator were also participated on data collection to oversee the whole process. One supervisor and 3 data collectors were in Agaro town, and the others in Gomma woreda .Women's Health development army Registration book at each kebele level was consulted to get exact village of sampled mothers lived in. They conduct the interview at the women's house of those who were eligible. In addition the interviewers were giving appointment mainly for those who could not be available at the time of house visit.

Variables

Dependent (outcome) variable

Utilization of skilled birth attendant at delivery

Independent (Exposure) variable

- Number of FANC Visits.
- Socio demographic factors (Age of mother, marital status, Religion, Ethnicity, occupation, education, monthly income).
- Obstetrics factors (Obstetrics history, parity, birth order, past history of pregnancy, delivery and post partum).
- Knowledge of mothers about pregnancy and delivery complications and services, beliefs and attitudes of mothers about health facilities, place of delivery, perception of mothers about benefits of having skilled attendant at delivery and barriers to utilization of skilled attendant at delivery
- Influence from husband and relatives Information
- Referral system, availability and accessibility of delivery service,

- Women's decision making power
- Information during FANC Service (Health promotions and diseases prevention, Early detection and treatment of complications and existing diseases, and Birth preparedness and complication readiness)

4.11 Data quality

Two days of training was given by the principal investigator, on the general objective of the study, technique of interview, how to approach the respondents and keep confidentiality and privacy. On the training session, 6.5% (24) of the questionnaire was tested on women that not sampled for the interview in the study area before launching of the actual study. Findings from the pre– test were used to modify and refine the data collection instrument. Questionnaires were checked for completeness on daily basis by immediate supervisors in the field. After checking for consistency and completeness, supervisors were submitting the filled questionnaire to the principal investigator. Incorrectly filled or missed ones were sent back to the respective data collectors for correction each morning .The principal investigator was also rechecked the completed questionnaire to maintain the quality of the data.

4.12 Data entry, cleaning and analysis

The coded data was entered, using Epi-info version 3.5.3 and was exported to SPSS version 17.0 for data cleaning and analysis. Analysis was done according to the objectives of the study. Descriptive statistics was used to describe the more necessary information in the study population and identify for further analysis.

The bivariate analysis with Chi-square ($\chi 2$)-statistics and Binary logistic regression model was performed to determine the association of FANC visits and other associated variables with the outcomes (skilled delivery attendant utilization). Results with P.value <0.2 in the bivariate analysis were included in the multivariate model. Results are presented as odds ratios (ORs) with their 95% confidence intervals (CIs). In the analysis, antenatal care was grouped by number of ANC visits: 1-3 visit, and ≥ 4 visits. Place of delivery was divided into home delivery or facility delivery. The net effect of each variable on the utilization of SDA services after controlling the effect of all the other variables included in the study was determined with multivariate logistic regression analysis in final model. Results of Multivariate logistic regression are presented as adjusted odds ratio (AORs) with 95%CI.

4.13 Operational Definition

Focused Antenatal Care:- those mothers who have attended antenatal care at Health Centers in Gomma woreda and Agaro Town at least once during their pregnancy, as recorded in the Antenatal Care Register of the health centers'.

Skilled Delivery Attendant utilization: - skilled attendant utilization was defined as a delivery that took place at Health Centers or at home by skilled attendant, or delivery where the obstetric patient was referred from the maternity ward of the Health Centers' to Jimma University specialized Hospital before delivery occurred and delivered at the Hospital.

Births in the last one year: - all births within the last one year irrespective of the outcome of the delivery, including live birth, abortion, still birth or death after live birth.

5. Ethical consideration

The ethical approval and clearance was obtained from Research and Ethics Committee of the school of Public Health, College of Health Sciences of Addis Ababa University. Letter of cooperation was also obtained from school of Public health to respective Zonal and woreda health departments. Formal official letter was written to each Health centers to use documents and to each kebele to conduct the study. Data collectors handled accordingly some psychological harms that would created as a result of interview, respect the participant's privacy and information obtained was kept confidential. Participation in the survey was voluntary. Individual verbal consent of the study participant was obtained.

6. Dissemination of Results

The findings of this study will be disseminated to Addis Ababa University School of Public Health as partial fulfillment of master's degree in public Health, Federal Ministry of Health,Oromia Regional Health Bureau, Jimma Zone Health office,Gomma Woreda and Agaro Town Health Office, to other concerned governmental and no-governmental organizations. The findings also will be presented in various workshops and may be also published in a scientific journal.

7. Results

7.1 Socio-demographic characteristics of Study Population

A total of 1822 mothers who have attended Focused antenatal care in Five Health centers in Gomma woreda and Agaro Town and whose Expected date of deliveries were between March 1/2004 E.c and February 30/2005 E.c were identified to get 369 mothers attended FANC and have delivered within one year preceding the survey. The survey covered 16 kebeles, five from Agaro town and 11 kebeles from Gomma woreda under the catchment of the five Health centers.

The overall response rate of the study was 369(100%). Two third (66.7%) of respondents were from Rural kebeles, of this 49(53.3%) were ≥4FANC attendant and197 (71.1%) were 1-3FANC attendant and two hundred twelve (57.4%) of respondents were in the age range of 20-29 years .The mean age of ≥4FANC attendant was 27.5±5 and 1-3 FANC attendant was 28±5.4.Married mothers account 351(95.2%) of all study subjects. Two hundred sixty seven (72.4%) were Muslims, 270(73.2%) of the ethnic group were Oromo and most were Farmers and housewife, 124(33.6%) and 202(54.7%) respectively. Regarding educational status 34 (37.0%) ≥4FANC and 136(49.1%) of 1-3 FANC attendant mothers were illiterate, 138(38.5%) of husbands attended primary education and only 71(19.3%) mothers reported that they have monthly income during the survey with mean income of 613.8±5.19. Two to four and five to seven family size were owned by 165(44.7%) ≥4 FANC attendants and 168(45.5) 1-3 FANC attendants of mothers respectively, with mean size of 4.7±1.8 and 5±1.7 for the groups (Table 1).

Table 1. Socio- demographic characteristics of FANC attendant mothers (n=369) in Gomma woreda and Agaro Town south west Ethiopia, March 2013.

Variables		≥4 FANC visit attendance (92) No (%)	1_3 FANC visit attendance (277) No (%)	Total (n=369) No (%)
Residence	Urban	43(46.7)	80 (28.9)	123(33.3)
	Rural	49(53.3)	197(71.1)	246(66.7)
Age of Respondents'				
	15-19	5(5.4)	13(4.7)	18(4.9)
	20-24	22(23.9)	59(21.3)	81(22.0)
	25-29	32(34.8)	87(31.4)	119(32.2)
	30-34	21(22.8)	72(26.0)	93(25.2)
	≥35	12(13.0)	46(16.6)	58(15.7)
	M±SD	27.5±5	28±5.4	27.8±5.3
Marital status				
	Married	90(97.8)	261(94.2)	351(95.1)
	others	2(2.2)	16(5.8)	18(4.9)
Religion				
	Orthodox	27(29.3)	62(22.4)	89(24.1)
	Muslim	61(66.3)	206(74.4)	267(72.4)
	protestant	4(4.3)	9(3.2)	13(3.5)
Ethnicity				
	Oromo	61(66.3)	209(75.5)	270(73.2)
	Amhara	12(13.0)	30(10.8)	42(11.4)
	Dawro	9(9.8)	24(8.7)	33(8.9)
	Others (Gurage, Silte,Tigre,kafa)	10(10.9)	14(5.1)	24(6.5)
Occupation				
	Farmer	16(17.4)	108(39.0)	124(33.6)
	Housewife	61(66.3)	141(50.9)	202(54.7)
	Gov't Employee	4(4.3)	11(4.0)	15(4.1)
	Private Business	11(12.0)	14(5.1)	25(6.8)
	Others	0(0)	3(1.1)	3(0.8)
Women's education status				
	Illiterate	34(37.0)	136(49.1)	170(46.1)
	Read and write	6(6.5)	42(15.2)	48(13.0)
	Primary education(1_8)	34(37.0)	74(26.7)	108(29.3)
	Secondary education and above(9_12+)	18(19.6)	25(9.0)	43(11.7)
Monthly in come				
	yes	14(15.2)	57(20.6)	71(19.2)
	No	77(83.7)	212(76.5)	289(78.3)
	Don't want to tell	1(1.1)	8(2.9)	9(2.4)
Husband's education status(358)				
	Illiterate	22(24.2)	60(22.5)	82(22.9)
	Read and write	14(15.4)	67(25.1)	81(22.6)
	Primary education(1_8)	35(38.5)	103(38.6)	138((38.5)
	Secondary education and above(9_12+)	20(22.0)	37(13.9)	57(15.9)
Family size				
	2-4	50(54.3)	115(41.5)	165(44.7)
	5-7	34(37.0)	134(48.4)	168(45.5)
	≥8	8(8.7)	28(10.1)	36(9.8)

M±SD	4.7±1.8	5.1±1.7	5.0±1.8
Monthly Income status in Birr/71/			
<200	4(26.7)	15(26.8)	19(26.8)
200-400	3(20.0)	16(28.6)	19(26.8)
400_900	5(33.3)	11(19.6)	16(22.5)
>900	3(20.0)	14(25.0)	17(23.9)
M±SD	633±5.3	608.5±5.2	613.7±5.2

7.2 Obstetric History of Respondents' and Delivery practice

Out of ever married women 205(69.1%) were married in age of 18 and above years with mean age of 19±3.4 and 18.9±2.8 for ≥4 and 1_3 FANC attendants. 32(34.8%) and 122(44.0%) of ≥4 and 1_3 FANC attendants were get pregnant before the age of 20 years. The mean age at first pregnancy was 20.7± 3.6 and 20± 3 for ≥4 and 1_3 FANC attendants respectively. Sixty (65.2%) of≥4 FANC attendants and 155(56.0%) of 1-3 FANC attendants have experienced pregnancy at the age of ≥20. Out of ≥4 FANC attendants 51(55.4%) and out of 1-3 FANC attendants 124 (44.8%) have get pregnant only once. The mean gravidity for the two respective groups was 3.5± 0.9 and 4.5± 1.2. Concerning parity, 30(32.6%) of ≥4 FANC attendants and 80(28.9%) 1-3 FANC attendant respondents were nully-parous. For each particular study groups the mean parity was 2.6 ± 1.6 and 2.9±1.8 respectively .Forty one (44.6%) of ≥4 FANC attendants and 44(15.9%) 1-3 FANC attended their 1st FANC in their 1sttrimester of pregnancy. The mean gestational age at the first antenatal care visit was 4.3 ±1.2SD months. Among ≥4 FANC attendants 72(78.3%) and among 1-3 FANC attendants 219(79.1%) were informed about pregnancy and delivery complications during their ANC visit, 82(89.1%) of ≥4 and 214(77.3%) 1-3 ANC attendants were informed where to deliver their baby. Sixty three (68.5%) and 133(48.0%) of ≥4 FANC attendants and 1-3 FANC attendants, respectively, delivered their child at Health institution (Hospital, Health center or clinic) under help of SBA. Three (3.3%) of ≥4 FANC attendant and 6(2.2%) of 1-3 FANC attendant birth outcome were still birth. During their antenatal care visits, 84(91.3%) of ≥ 4FANC attendants and 234(84.5%) 1-3 attendants were screened for pregnancy complications and existing diseases, Fifty one (55.4%) of ≥4 and 80(28.9%) 1-3 attendants have get treatment. Almost all of, 90 (97.8%) ≥4 ANC and 1-3 ANC 266(96.0%) attendants received pregnancy related preventive interventions like Tetanus Toxoid immunization and iron foliate.(Table 2).

Table 2. Obstetric History of Mothers' (n=369) in Gomma Woreda and Agaro Town, south west Ethiopia, March, 2013.

Variables	≥4 ANC visit attendance (92) No (%)	1_3 ANC visit attendance (277) No (%)	Total (n=369) No (%)
Age at first marriage			
<18 years	26(28.3)	86(31.9)	112(30.9)
≥18 years	66(71.7)	184(68.1)	250(69.1)
M±SD	19±3.4	18.7±2.9	18.9±3.0
Age at first pregnancy			
<20 years	32(34.8)	122(44.0)	154(41.7)
≥20 years	60(65.2)	155(56.0)	215(58.3)
M±SD	20.8±3.6	20.4± 3.1	20.5± 3.2
Gravidity (Number of preg.>28wks)			
1	51(55.4)	124(44.8)	175(47.4)
2_4	27(29.3)	89(32.1)	116(31.4)
≥5	14(15.2)	64(23.1)	78(21.1)
M±SD	2.7 ±1.7	3.1± 1.9	2.9 ±1.8
Parity(Number of Birth)			
1	30(32.6)	80(28.9)	110(29.8)
2_4	50(54.3)	136(49.1)	186(50.4)
≥5	12(13.0)	61(22.0)	73(19.8)
M±SD	2.7± 1.7	2.9 ±1.8	2.9 ±1.8
Gestational age in month at 1st FANC			
1_3	41(44.6)	44(15.9)	85(23.0)
4_6	51(55..4)	216(78.0)	267(72.4)
7_9	0(0)	17(6.1)	17(4.6)
M±SD	3.6± 0.9	4.6 ±1.2	4.3± 1.2
Informed regarding pregnancy and delivery complication during FANC follow up			
Yes	72(78.3)	219(79.1)	291(78.9)
No	20(21.7)	57(20.6)	77(20.9)
I don't know	0(0)	1(0.4)	1(0.3)
Informed where to deliver			
Yes	82(89.1)	214(77.3)	296(80.2)
No	10(10.9)	63(22.7)	73(19.8)
Result of Last Birth			
Live	89(96.7)	271(97.8)	360(97.6)
Still birth	3(3.3)	6(2.2)	9(2.4)
Place of Delivery			
Health Facility(Clinic, HC or Hospital	**63(68.5)**	**133(48.0)**	**196(53.1)**
Home	**29(31.5)**	**144(52.0)**	**173(46.9)**
Screened for any complication and diseases during FANC			
Yes	84(91.3)	234(84.5)	318(86.2)
No	8(8.7)	43(15.5)	51(13.8
Treated for complication and existing diseases during FANC			
Yes	51(55.4)	80(28.9)	131(35.5)
No	41(44.6)	197(71.1)	238(64.5)
Uptake of preventive intervention related to pregnancy			
Yes	90(97.8)	266(96.0)	356(96.5)
No	2(2.2)	11(4.0)	13(3.5)

Out of the total 369 respondents of the study 196(53.1%) were delivered at health facility while 173(46.9%) were delivered at home (Fig. 2)

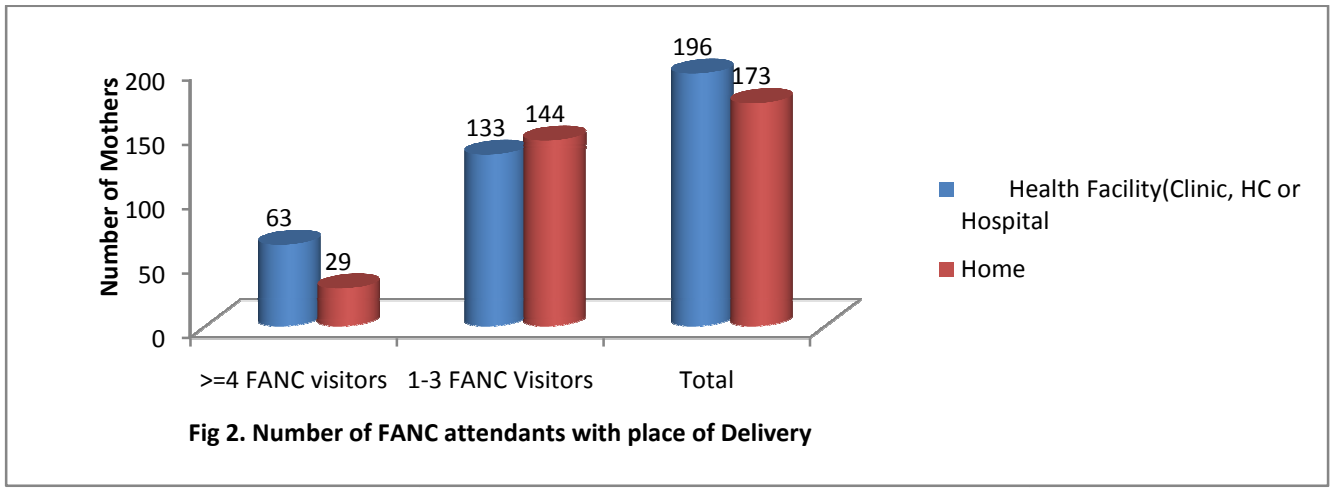


Fig 2. Number of FANC attendants with place of Delivery

Out of the total 196 institutional deliveries; 159(81.1%) were attended by midwives and Nurses, the rest were attended by Doctors 24(6.5%) and Health officers 13(3.5%) (Fig 3) and out of 173 of home deliveries, 88 (51%) were assisted by Family members and relatives and 13 (8%) deliveries were attended by Health extension workers respectively (Fig 4).

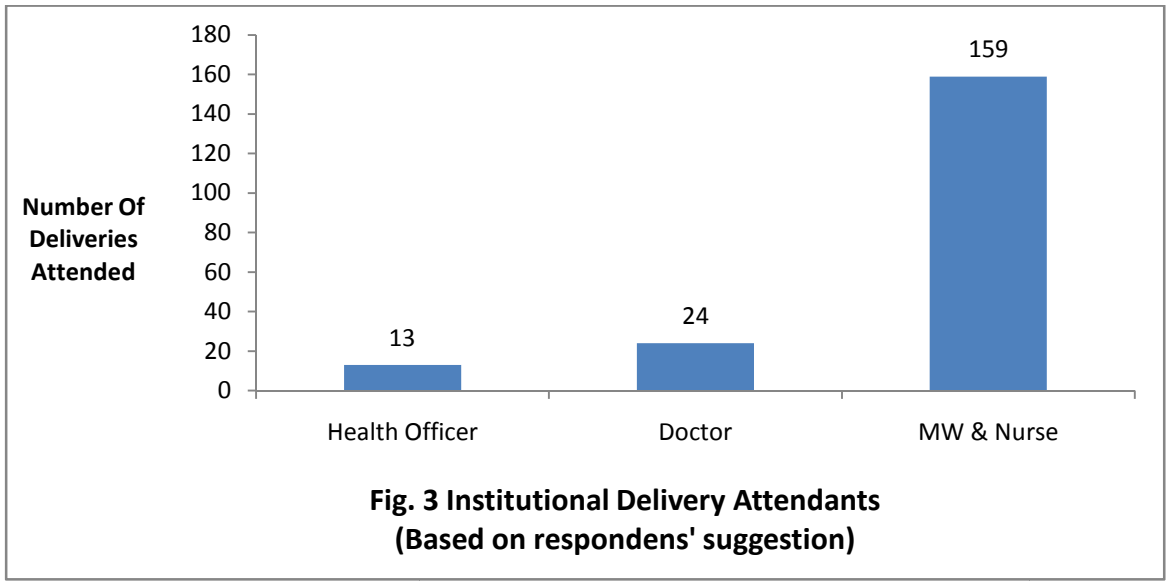


Fig. 3 Institutional Delivery Attendants (Based on respondens' suggestion)

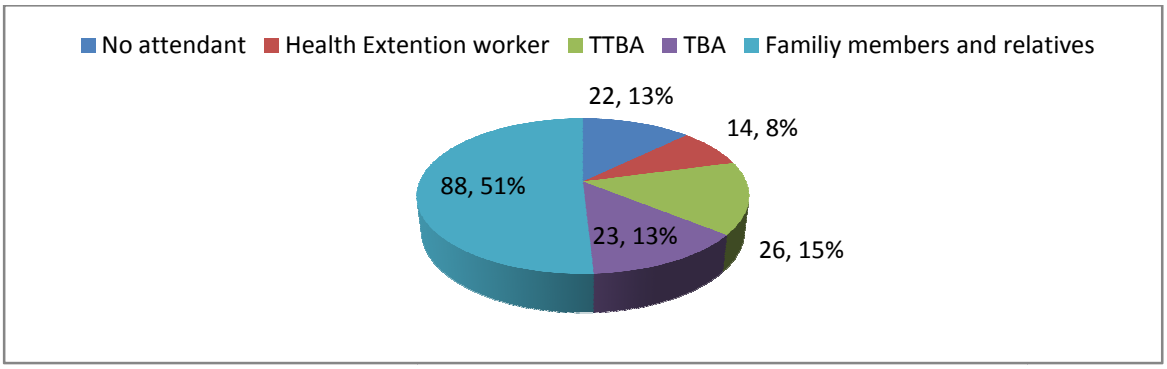


Fig 4. Home delivery Assistants

7.3 Predisposing, Enabling and Reinforcing Factors

On questions provided to test perception about susceptibility to pregnancy and delivery complication, its severity to mothers and newborns wellbeing, and on the benefits of being attended by SDA's most of ≥4 and less attendants of FANC Attendant were agreed up on. (Table 3).

Table 3. Perceptions (perceived severity, susceptibility, and benefit of maternal services) of respondents (n=369) by ANC exposure status in Gomma woreda and Agaro Town, March 2013,.

Attitude statements	≥4 FANC Attendant			1-3 FANC Attendant		
	Agree No (%)	Indifferent No (%)	Disagree No (%)	Agree No (%)	Indifferent No (%)	Disagree No (%)
Any pregnant mother is susceptible to pregnancy & delivery complication	64(69.6)	10(10.9)	18(19.6)	199(71.8)	42(15.2)	36(13.0)
Delivery complication can be sever and may be hazardous to mother well being	85(92.4)	4(4.3)	3(3.3)	251(90.6)	19(6.9)	7(2.5)
Delivery complication can be sever and may be hazardous to the new born	86(93.5)	0(0.0)	6(6.5)	246(88.8)	18(6.5)	13(4.7)
Being attended by SDA may be beneficial to mother's wellbeing	85(92.4)	0(0.0)	7(7.6)	258(93.1)	8(2.9)	11(4.0)
Being attended by SDA may be beneficial to newborn's wellbeing	85(92.4)	0(0.0)	7(7.6)	258(93.1)	8(2.9)	11(4.0)

Based on the number of response they gave on obstetric problems that can occur during labor and child birth that could endanger the life of mothers' 49(70.0%) of ≥4FANC visitors and 124(63.9%) of 1-3 FANC visitors were classified as knowledgeable.Similarly, 67 (72.8%) and 205(74.3%) of ≥4 and 1-3 FANC visitors were know advantage of Pregnancy and delivery service. Eighty eight (95.7%) of ≥4 FANC and 237(85.6%) 1-3 FANC attendants were live near health Facility staffed with SDA, 66(71.7%) and 152(54.9%) of the two respective group can afford to pay for the service from SDA. Only few of 10(3.6%) 1-3 FANC attendants did not hear the health facilities refer mothers to higher health facilities at the time of Survey. Time to travel from home to HC was less than 30minutes for 59(64.1%) of ≥4 FANC visitors and for 265(95.7%) of 1-3 ANC Visitors. 348(94.3%) of respondents were reported that they have access to maternal and child health information. The sources of information for most of the respondents was Health workers, 70(76.1%) and 207(74.7%) of ≥4 and 1-3 FANC attendants respectively. Less than one fourth of ≥4 FANC visitors, 17(18.5%) and 43(15.5%) of 1-3 FANC visitors were implemented Birth Preparedness and Complication Readiness BPCR plan (Table 4).

Table 4. Predisposing and enabling factors for utilization of SDA at birth in study area, March 2013.

Variables	≥4 ANC visit attendance (n=92) No (%)	1_3ANCvisit attendance (n=277) No (%)	Total (369) No(%)
Health facility with SDA in near by			
Yes	88(95.7)	237(85.6)	325(88.1)
No	4(4.3)	40(14.4)	44(11.9)
Can afford to pay for service from SDA			
Yes	66(71.7)	152(54.9)	218(59.1)
No	23(25.0)	116(41.9)	139(37.7)
Don't know	3(3.3)	9(3.2)	12(3.3)
Heard that HC refer mothers to higher HF			
Yes	91(98.9)	265(95.7)	356(96.5)
No	0(0.0)	10(3.6)	10(2.7)
Don't know	1(1.1)	2(0.7)	3(0.8)
Time to travel from home to HC with walk			
<30minutes	59(64.1)	131(47.3)	190(51.5)
30min_1 hour	15(16.3)	83(30.0)	98(26.6)
>1hr	18(19.6)	63(22.7)	81(22.0)
Access to maternal and child health information			
Yes	90(97.8)	258(93.1)	348(94.3)
No	2(2.2)	19(6.9)	21(5.7)
Radio as Source of information(348)			
Yes	44(47.8)	141(50.9)	185(50.1)
No	46(50.0)	117(42.2)	163(44.2)
TV as Source of information(348)			
Yes	13(14.1)	58(20.9)	71(19.2)
No	77(83.7)	200(72.2)	277(75.1)
Health Workers as Source of information(348)			
Yes	70(76.1)	207(74.7)	277(75.1)
No	20(21.7)	51(18.4)	71(19.2)
News Paper as Source of information(348)			
Yes	0(0.0)	4(1.4)	4(1.1)
No	90(97.8)	254(91.7)	344(93.2)
Knowledge status of obstetric problems can occur during pregnancy			
Not Knowledgeable	49(72.1)	124(64.9)	173(66.8)
Knowledgeable	19(27.9)	67(35.1)	86(33.2)
Knowledge of obst.problems during child birth may endanger mother's life			
Not knowledgeable	21(30.0)	70(36.1)	91(34.5)
Knowledgeable	49(70.0)	124(63.9)	173(65.5)
Knowledge status on advantage of pregnancy and delivery H/Service			
Not knowledgeable	25(27.2)	71(25.7)	96(26.1)
Knowledgeable	67(72.8)	205(74.3)	272(73.9)
Birth preparedness & complication Readiness (BPCR)			
Not prepared	23(25.0)	107(38.6)	130(35.2)
Well prepared	52(56.5)	127(45.8)	179(48.5)
Prepared	17(18.5)	43(15.5)	60(16.3)

Preference as place of delivery 279(75.6%) and delivery attendant by most Husband's 280(75.9%), Family members preference as place of delivery 286(77.5%) and delivery attendant 277(75.1%) was health facility and SBA and the preference of community in which mothers lived in was Health facility as place of delivery 280(75.9%) for FANC attendants (Table 5).

Table 5. Reinforcing factors of FANC attendants for utilization of SBA in Gomma woreda and Agaro town, March 2013.

Variables	≥4 ANC visit attendance(n=92) No (%)	1_3 ANC visit attendance(n=277) No (%)	Total (369) No (%)
Preference of husband to place of delivery(n=365)			
Home	11(12.0)	75(27.1)	86(23.3)
Health Facility	80(87.0)	199(71.8)	279(75.6)
Preference of husband about delivery attendant(363)			
SDA	77(83.7)	203(73.3)	280(75.9)
TTBA	8(8.7)	31(11.2)	39(10.6)
TBA	2(2.2)	13(4.7)	15(4.1)
Family members and relatives	4(4.3)	25(9.0)	29(7.9)
Preference of other family members about place of delivery			
Home	13(14.1)	69(24.9)	82(22.2)
Health Facility	78(84.8)	208(75.1)	286(77.5)
Every where	1(1.1)	0(0)	1(0.3)
Preference of other family members about delivery attendant			
SDA	74(80.4)	203(73.3)	277(75.1)
TTBA	8(8.7)	21(7.6)	29(7.9)
TBA	5(5.4)	20(7.2)	25(6.8)
Family members and relatives	4(4.3)	33(11.9)	37(10.0)
other	1(1.1)	0(0.0)	1(0.3)
Preference of the community members about place of delivery			
Home	13(14.1)	75(27.1)	88(23.8)
Health facility	79(85.9)	201(72.6)	280(75.9)
Other(Don't know)	0(0.0)	1(0.4)	1(0.3)

Major Reasons of 196 Mothers those delivered their child in Health institution to deliver there were: Better service in Health facility 167(85.2%), better out come from institutional delivery 137(69.9%) and because of informed to deliver in health facility 136(69.4%) during their FANC visits (Fig 5).

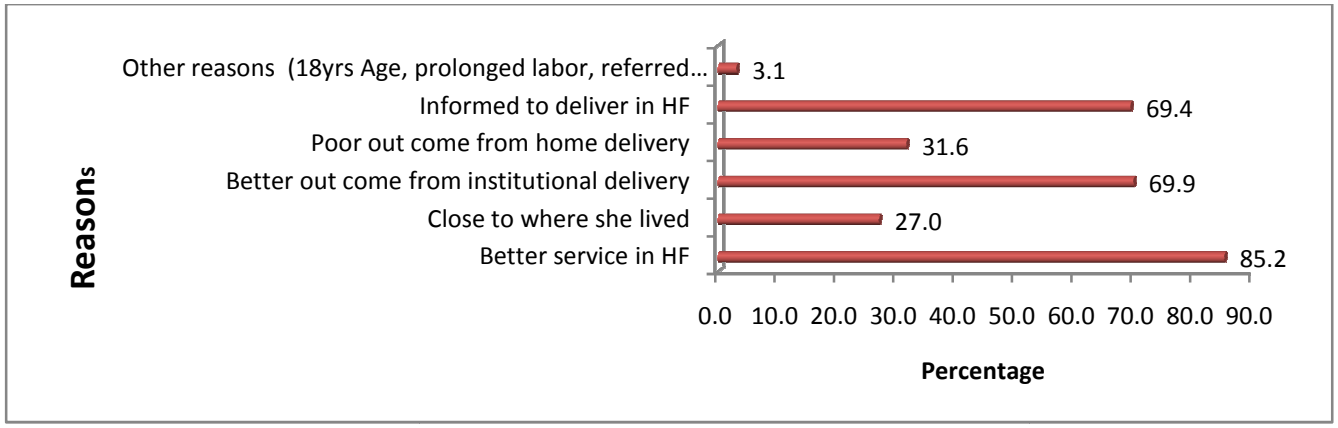


Fig 5. Reasons to Deliver at Health Facility

Reasons for home delivers of 173 were: Feel more comfortable being at home 60 (34.7%), to get close attention from relatives and family members 38(22.0%) and Others 91(52.6%) ((Labor was urgent to reach HF(31),Labor was urgent and at night and no transportation[25],Lack of transportation(9),the labor and delivery was have no problem(7), others(19)) Fig 6).

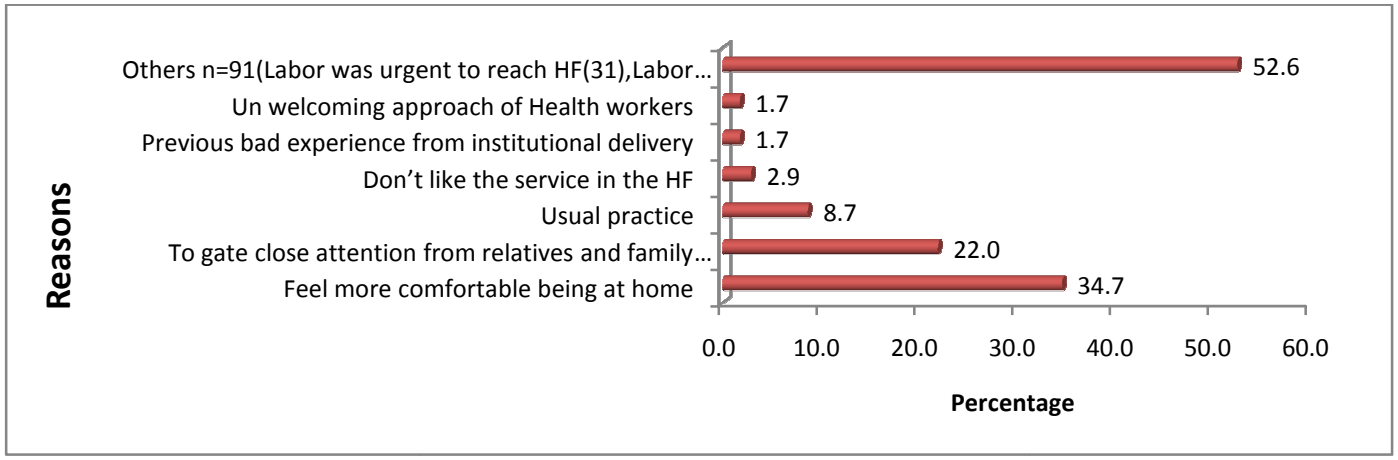


Fig 6. Reasons to Home Delivery

7.4 Factors Associated with Utilization of SDA at Birth

On bivariate analysis of using chi-square and Binary logistic Regression, socio demographic factors such as Residence of Mothers, Ethnicity, Occupation of mothers, Educational status, Family size, Religion and Husband's education status has association with utilization of Skilled delivery Attendant service at Birth (Table 6).Number of Focused Antenatal care visits, Gravidity (Number of pregnancy experienced) and parity were also predictor of utilization of SDA at health facility (Table 7). Enabling and reinforcing factors such as time to travel to nearest Health facility, access of maternal and child health information, presence of Health facility with SDA nearby, affordability to pay for service from SDA, Husbands' preference as place of Delivery, Family members' preference as place of Delivery, Community's preference as place of delivery and Birth preparedness and complication Readiness had association with utilization of SDA at birth (Table 8).

However, on final model multivariate analysis, only Mothers educational status (particularly secondary education and above), Religion, length of time required to travel to nearby Health institution with SDA on walk, Husband's preference as place of delivery and Birth Preparedness and Complication Readiness status were associated with utilization of SDA at delivery among FANC attendants (Table 9).

7.4.1 Socio-demographic Influencing Factors on Utilization of SDA at Birth

On model 1 Multivariate analysis adjusted for socio-demographic factors women residing in urban were about 2 times more likely to utilize SDA than mothers residing in rural (AOR=2.3, 95%CI=[1.2, 4.2]). Protestant religion follower in the study area were 0.14 times (AOR=0.14, 95%CI= [0.027, 0.75]) less likely to gave birth in a health facility than Muslims and Orthodox religion followers. Mothers attended primary education and secondary education and above were about 2 times (AOR=2.1, 95%CI= [1.1, 4.2]) and 8 times (AOR=8.0, 95%CI=[1.8, 35.0]) more likely utilize SBA at birth than those who were illiterate and can read and write only (Table 6) .

Table 6. Bivariate and multivariate Analysis of socio-demographic factors Associated with Skilled Delivery Attendant among mothers attending FANC in Gomma Woreda and Agaro Town, March, 2013.

MODEL 1				
Variables	Place of Delivery		COR (95%CI)	AOR(95%CI)
	Health Facility No(%)	Home No (%)		
Residence				
Urban	90(73.2)	33(26.8)	3.6(2.2,5.8)	**2.3(1.2,4.2)**
Rural	106(43.1)	140(56.6)	1.0	1.0
Ethnicity				
Oromo	133(49.3)	137(50.7)	1.00	1.0
Amhara	30(71.4)	12(28.6)	2.64(1.3,5.2)	1.6(0.59,4.6)
Dawro	15(45.5)	18(54.5)	0.86(0.42,1.80)	0.7(0.29,1.9)
Others(23)*	18(75.0)	6(25.0)	3.1(1.2,8.0)	1.4(0.37,5.3)
Occupation				
Farmer	50(40.3)	74(59.7)	1.0	1.0
House wife	113(55.9)	89(44.1)	1.9(1.19,2.9)	1.0(0.6,1.8)
Gov't employee	14(93.3)	1(6.7)	20.7(2.6,162.6)	3.8(0.37,37.9)
Private Business	18(72.0)	8(28.0)	3.8(1.5,9.8)	1.8(0.5, 5.9)
Mother's Educational status				
Illiterate	62(36.5)	108(63.5)	1.0	1.0
Read and write	27(56.3)	21(43.8)	2.2(1.2,4.3)	2.1(0.97, 4.4)
Primary education	67(62.0)	41(38.0)	2.8(1.7,4.7)	**2.1(1.1, 4.2)**
Secondary education and above	40(93.)	3(7)	23.8(6.9,78.2)	**8.0(1.8,35.0))**
Family size				
2-4	102(61.8)	63(38.2)	3.2(1.5,6.9)	1.4(0.6, 3.2)
5-7	82(48.8)	86(51.2)	1.9(0.9,4.1)	1.5(0.7, 3.5)
≥8	12(33.3)	24(66.7)	1.0	1.0
Religion				
Muslim	130(48.7)	137(51.3)	1.0	1.0
Orthodox	62(69.7)	27(30.3)	2.4(1.5,4.0)	1.8(0.8, 3.8)
Protestant	4(30.8)	9(69.2)	0.5(0.14,1.6)	**0.14(0.027,0.75)**
Husbands' Educational status(358)				
Illiterate	37(45.1)	45(54.9)	1.0	1.0
Read and write	30(37.0)	51(63.0)	0.72(0.38,1.3)	0.6(0.3, 1.2)
Primary education	77(55.8)	61(44.2)	1.5(0.89,2.7)	0.72(0.35, 1.5)
Secondary education and above	47(82.5)	10(17.5)	5.7(2.5,12.8)	1.1(0.35, 3.2)

*other-Gurage, silte,kafa,Tigre

On model 2 multivariate analysis adjusted for obstetric factors, women attended ≥4 focused antenatal care were about more than 2 times more likely (AOR=2.2, 95%CI= [1.3, 3.7]) utilize skilled delivery attendant service at child delivery than those mothers attended 1-3 FANC. Mothers with single parity were about more than 3.6 times more likely utilize skilled delivery attendant service at delivery(AOR=3.6, 95%CI=[1.9, 6.8]) (Table 7).

7.4.2 Effect of Obstetric Factors On utilization of SDA at Birth

Table 7. Bivariate and multivariate Analysis of obstetric Factors associate with SDA service utilization at birth among mothers attending FANC in Gomma woreda and Agaro Town, March, 2013.

	MODEL 2			
Variables	Place of Delivery		COR (95%CI)	AOR(95%CI)
	Health Facility No (%)	Home No (%)		
FANC Visit Number				
≥4	63(68.5)	29(31.5)	2.4(1.45,3.9)	**2.2(1.3, 3.7)**
1_3	133(48.0)	144(52.0)	1.0	1.0
Parity				
1	73(66.4)	37(33.6)	3.8(2.0,7.1)	**3.6(1.9, 6.8)**
2_4	98(52.7)	88(47.3)	2.1(1.2,3.7)	**2.0(1.1, 3.5)**
≥5	25(34.2)	48(65.8)	1.0	1.0

7.4.3 Enabling and Reinforcing Factors associated with SDA Utilization at Birth

In Model 3 Multivariate analysis, mothers lived in a distance of 30 minutes and below on walk were about 6 times more (AOR=5.8, 95%CI= [2.9,11.5]), mothers implemented birth preparedness and complication readiness well were about 2 times more (AOR=2.2, 95%CI=[1.2,4.0]) and those implemented BPCR fully were about three times more likely (AOR=3.2, 95%=[1.4, 7.2]) utilize SDA at birth than those lived in a distance of more than 30minutes walk to health facility and than those mothers did not implemented BPCR plans respectively. Wives of those their husbands' preference of delivery place was at home were 0.078 times less likely utilize SDA service at delivery than those their husband's preference of place of delivery was at health facility(AOR=0.078, 95%CI=[0.02, 0.22]) (Table 8).

Table 8. . Bivariate and multivariate analysis of Enabling (Availability& Accessibility of service) and Reinforcing factors associated with utilization of SBA service at delivery among mothers attending FANC in Gomma woreda and Agaro Town, March, 2013.

MODEL 3				
Variables	Place of Delivery		COR (95%CI)	AOR (95%CI)
	Health Facility No (%)	Home No (%)		
Time to travel in walk from home to nearest HF				
<30min	131(68.9)	59(31.1)	4.7(2.6,8.2)	**5.8(2.9, 11.5)**
30min_1hr	39(39.8)	59(60.2)	1.4(0.8,2.6)	1.9(0.9, 4.2)
>1hr	26(32.1)	55(67.9)	1.0	1.0
Access to maternal and child health information				
Yes	194(55.7)	154(44.3)	11.9(2.75, 52.1)	5.2(0.9, 29.7)
No	2(9.5)	19(90.5)	1.0	1.0
Presence of H/Facility with SDA near by				
Yes	183(56.3)	142(43.7)	3.0(1.6,6.1)	1.4(0.59,3.4)
No	13(29.5)	31(70.5)	1.0	1.0
Can afford to pay for service from SDA				
YES	127(58.3)	91(41.7)	6.9(1.5,32.6)	5.6(0.7, 42.2)
NO	67(48.2)	72(51.8)	4.7(0.98,22.0)	5.3(0.69,41.3)
Don't know	2(16.7)	10(83.3)	1.0	1.0
Husbands' preference as place of Delivery/365/				
Home	7(8.1)	79(91.9)	0.04(0.019,0.097)	**0.078(0.02,0.22)**
Health institution	188(67.4)	91(32.6)	1.0	1.0
Family members' preference as place of Delivery/368/				
Home	13(15.9)	69(84.1)	0.11(0.057,0.204)	0.49(0.18, 1.3)
Health institution	182(63.6)	104(36.4)	1.0	1.0
Community's preference as place of delivery/368/				
Home	23(26.1)	65(73.9)	0.22(0.13,0.38)	0.83(0.36,1.9)
Health institution	172(61.4)	108(38.6)	1.0	1.0
BPCR Status				
Not prepared	48(36.9)	82(63.1)	1.0	1.0
Well prepared	110(61.5)	69(38.5)	2.7(1.7,4.3)	**2.2(1.2, 4.0)**
prepared	38(63.3)	22(36.7)	2.9(1.6,5.6)	**3.2(1.4, 7.2)**

In the final model multivariate analysis, there was no statistical difference on utilization of skilled delivery care among mothers attended 1_3 and ≥4 FANC. Mothers who have attended secondary education and above were about 8 times (AOR=7.7, 95%CI= [1.9, 31.9) more likely to utilize SDA than mothers attending primary education and below. Protestant religion follower in the study area were 0.19 times (AOR=0.19, 95%CI= [0.04, 0.99] less likely to gave birth in a health facility than Muslims and Orthodox religion followers. Out of enabling and reinforcing factors for utilization of Skilled Delivery attendant service for delivery, mothers those lived in a distance of 30 minutes' walk to nearby Health facility were about more than 2 time more likely to gave birth in a health facility than those mothers lived in a distance of 1 hour and above walk from health facility (AOR=2.5, 95%CI=[1.1, 5.7]).Those mothers their husband's preference as place of delivery was home were 0.05 less likely to deliver in health facility than those mothers their Husband's preference of delivery place was health institution(AOR=0.05, 95%CI=[0.02, 0.11]).Mothers implemented birth preparedness and complication readiness(BPCR) plans well were found to utilize SDA at birth about 3 times (AOR=2.7, 95%CI=[1.4, 4.9]) more likely and those fully prepared were about 4 time (AOR=3.7, 95%CI=[1.6, 8.5]) more likely than none prepared mothers respectively (Table 9).

Table 9.**Multivariate analysis of factors associated with skilled birth attendant service utilization among mothers attending FANC in Gomma Woreda and Agaro Town, West Ethiopia, March 2013.**

FINAL MODEL					
Variables	Place of Delivery		Crude OR (95%CI)	AOR (95%CI)	P.value
	Health Facility	Home			
Residence					
Urban	90(73.2)	33(26.8)	**3.6(2.2,5.8)**	1.9(0.85,4.7)	
Rural	106(43.1)	140(56.6)	1.0	1.0	
Mother's Educational status					
Illiterate	62(36.5)	108(63.5)	1.0	1.0	
Read and write	27(56.3)	21(43.8)	2.2(1.2,4.3)	1.3(0.55,2.9)	
Primary education	67(62.0)	41(38.0)	2.8(1.7,4.7)	1.9(0.96,3.6)	
Secondary education and above	40(93.)	3(7)	23.8(6.9,78.2)	**7.7(1.9,31.9)**	0.005*
Religion					
Muslim	130(48.7)	137(51.3)	1.0	1.0	
Orthodox	62(69.7)	27(30.3)	2.4(1.5,4.0)	1.8(0.87,3.6)	
Protestant	4(30.8)	9(69.2)	0.5(0.14,1.6)	**0.19(0.04, 0.9)**	0.048*
Time to travel in walk from home to nearest HF					
≤30min	131(68.9)	59(31.1)	4.7(2.6,8.2)	**2.5(1.1, 5.7)**	0.025*
30min_1hr	39(39.8)	59(60.2)	1.4(0.8,2.6)	1.8(0.8, 3.7)	
>1hr	26(32.1)	55(67.9)	1.0	1.0	
Husbands' preference as place of Delivery					
Home	7(8.1)	79(91.9)	0.04(0.019,0.097)	**0.05(0.02, 0.1)**	0.001*
Health institution	188(67.4)	91(32.6)	1.0	1.0	
BPCR Status					
Not prepared	48(36.9)	82(63.1)	1.0	1.0	
Well prepared	110(61.5)	69(38.5)	2.7(1.7,4.3)	**2.7(1.4, 4.9)**	0.002*
prepared	38(63.3)	22(36.7)	2.9(1.6,5.6)	**3.7(1.6, 8.5)**	0.002*
FANC Visit Number					
≥4	63(68.5)	29(31.5)	**2.4(1.43,3.9)**	1.2(0.6, 2.3)	
1_3	133(48.0)	144(52.0)	1.0	1.0	
Parity					
1	73(66.4)	37(33.6)	**3.8(2.0,7.1)**	1.9(0.86, 4.6)	
2_4	98(52.7)	88(47.3)	**2.1(1.2,3.7)**	1.1(0.56, 2.32)	
≥5	25(34.2)	48(65.8)	1.0	1.0	

8. DISCUSSION

This community based comparative cross-sectional study attempted to assess the effect of focused Antenatal care visit on utilization of skilled birth attendant service, among mothers who have attended FANC at Health Centers and gave birth in the one year preceding the survey in Gomma woreda and Agaro Town. The study results showed that the magnitude of birth by skilled attendant among FANC visitors was 53.1% in the study area. This had large difference when compared to general institutional delivery in Oromia region which was 8.2% in EDHS 2011[9].

This study also revealed that utilization of SDA among ≥4 FANC attendants was 68.5% and 48.8% among 1-3 FANC visit attendants. In bivariate analysis mothers who had attended ≥4 FANC visit during their pregnancy were 2.2 times more likely to deliver in health facilities than those who have attended 3 and below FANC Visits during last pregnancy. This finding was higher than Ethiopian 2011 DHSs which was 14.4 % of institutional delivery to women who made one to three visits and 34.3 %t of institutional delivery to women who made four or more ANC visit [9].But this might be due to ANC attendant in EDHS includes ANC given by health extension workers and all women with access and without access to health services. Interestingly, the final mode multivariate analysis of this study showed that attending more number of FANC in health centers was not associated with utilization of skilled delivery attendant during child birth inconsistent with community based cross-sectional studies in sekela District North west Ethiopia, which was ≥4 ANC visitors utilized SDA 7.3 times more than 1 and 2-3 ANC visitors[12], with a study done on Facility delivery among women attending 3 or more ANC visits in Bangladesh comparison to women with 0 or 1 ANC were 3.25 and 2.74, respectively [22] and with study in Uganda that revealed 4^{+} ANC visitors utilize SDA 2.2 times more than <4 ANC visitors [14]. This finding strengthened the principle of the FANC, the focus should be on individualized care and not number of routine visits even though each ANC visit can provide opportunities for providers to promote a specific place of delivery or give women information on the status of their pregnancy that alerts them to decide to deliver under the care of SBA than less than four visitors'. But this finding was consistent with findings of WHO,UNICEF: Antenatal care in developing countries : promises, achievements and missed opportunities : an analysis of trends, levels and differentials, it has been indicated that antenatal

care was less effective in sub-Saharan Africa in getting women to use skilled attendance at delivery[28]. This finding was also similar to a study in rural Kenya that confirmed antenatal care was not yet meeting its potential to serve as an entry into the healthcare system at the time of delivery [5]. This could be due the quality of service provided to mothers in each visits, competency of providers in implementing packages of FANC services, focus of antenatal care to detriment of delivery care or care for the management of obstetric complications.

Parity and Residence of mother were associated with utilization of skilled delivery attendant only on bivariate analysis. This finding was inconsistent with EDHS 2011[9] , findings of community based cross sectional studies in Benishangul Gumz Metekel Zone, sekela District North west Ethiopia, Munesa woreds south East Ethiopia, Arsi Zone South East Ethiopia and North Gonder Zone [4,12,13,20,27].Regarding to residence, it might be due to reasonable health service coverage was attained 100% for Aggaro Town and 70% for Gomma woreda [35,36]. Concerning parity, it might be due to homogeneity that most mothers 80% lived in 4 and below family size in this study.

Among Socio-demographic factors mother's educational status (particularly secondary education and above Education) had also significant association with SDA utilization at Birth. Mothers who have attended secondary and above educational level were eight times more likely to utilize health facility delivery service than illiterate, can read and write and mothers attended primary education. This finding was also consistent and similar to studies conducted in different part of Ethiopia; Sekela District,Munesa Woreda,North Gonder,Sidama Zone [12,13, ,27,28,] and with findings of maternal health service in Ethiopia [30]. And it was also inline with finding from Uganda and Nepal that showed being attending secondary and above education enables women to utilize SDA service more likely than mothers attended below secondary education level[14,29].This was might be educated women can understand severity of pregnancy and delivery complication and can take over advantages of maternal care services and education may enable mothers to understand counseling by health care provider during FANC visits easily than none-educated mothers.

Religion was found as one factor associated in inhibiting utilization of skilled birth attendant at child birth. Protestant religion follower mothers in the study area were 0.19 times less likely to gave birth in a health facility than Muslims and Orthodox religion followers. This finding was contrast with study in Arsi Zone ,south west Ethiopia reported in their study Orthodox Christians and Muslims were 0.36 and 0.31 less likely to utilize skilled birth attendant service than other Christians [20] and with EDHS 2000 in depth analysis that reported Orthodox/Catholic, Muslim, and Protestant women were exhibited greater use of maternal health care Services than women who follow traditional beliefs[30] though the current study was not reported for traditional believers. Nonetheless, how religion influences FANC attendants in utilization of skilled delivery care service was not clear, needs further investigation.

Length of time required for traveling to nearby Health institution on walk has significant association with utilization of skilled birth attendant service. These findings was also consistent with EDHS 2011 results for Oromia region that have been reported the reasons given by the region's women not to deliver in health facility were, too far/no transportation (18.3%),and husband/family did not allow (1.6%).Studies in Zambia, Uganda and in North west Ethiopia confirmed that Women who lived within a radius of 5 kilometers to the nearest health facility providing maternal health and delivery services were more than 39% less likely to deliver at home compared to those who lived more than 5 km away [33,14,27]. This could be explained simply from the reasons that home delivered women's listed .Most reasons for home deliveries were short labor to go to far Health facility and lack of transportation. Women lived in a distance of 30 minutes and below might not faced these problems.

Birth Preparedness and Complication Readiness was found strong factor associated with utilization of skilled attendant during delivery of child in this study. Those mothers implemented birth preparedness and complication readiness (BPCR) plans well were found to utilize SDA at birth about 3 times more likely and those fully prepared were 4 times more likely than none prepared mothers respectively. This was consistent with similar study in south-western Uganda that shows there was a significant association between birth preparedness and assistance by SBAs [14]. One of the major goals of FANC should be enabling mothers to return back to health institution during labor and delivery. For this the strategy is BPCR plan counseling. Since labor

is “emergency” for every pregnant mother, the arranged Birth plan might have good benefit the well prepared and fully prepared mothers can easily access skilled attendants and other necessary logistics and supplies.

Preference of husbands’ as place of delivery for their wives’ was also factors associated with skilled attendant service utilization at child birth among FANC visitors. In this study those mothers their husbands’ preference of delivery place was at their own home were 0.05 times less utilize skilled delivery than mothers their husbands’ preference of place of delivery was in health institution. This finding was in line with a study in Mekele Town stated that wives of those husband’s preference for delivery attendant was skilled health professionals were five times more likely to utilize SDA than those their husband’s preference were TBA or family members [24].This reason for this could be in time of labor mothers are unable to decide what to decide where to deliver and who should attend here, by this time they obligated to consult others for decision and help; the first person to make the final decision and help seeker would be husbands. so that they have implemented what they prefer only.

9. Strength and Limitation of the Study

Strength: Tracing and comparing of only FANC attended mothers that delivered within one year preceding the survey.The study covered 16 kebeles under the catchment of the 5 health centers in the study area in tracing and intervienig each study subject at their home.

Limitation: since it was cross-sectional there may recall and interviewer bias were the potential limitations of this study. Considering time, budget and challenges in tracing mothers, mothers lived in far catchment kebeles were excluded during record retrieve of Name and address and number of ANC visits. Large Sample sizes more than this study may be preferable. But Starting from proposal development till finalizing analysis many scientific methods (careful data management and performing simple to complex statistical analysis by standard computer software packages) were implemented to minimize these problems.

10. Conclusion

This study revealed that Focused Antenatal care service at Health centers during pregnancy had improved magnitude of institutional delivery in general.Therefor; attending FANC has an effect on utilization of skilled birth attendant service during child birth. But there was no statistical difference between attending 1-3 and ≥4 FANC visits in utilization of SDA at birth. Instead, Socio-demographic factors like mother's educational level, religion, leaving in a distance of less than 30mitutes walk to nearest Health facility with SDA, enabling and reinforcing factors such as implementing Birth preparedness and complication readiness plan before and during birth, and preference of husband's as place of delivery were strongly associated with utilization of SDAs among mothers who have attended FANC.Therefor, enable pregnant mothers to attend their ANC followup with skilled providers and allievate other social issues inorder to increase skilled birth attendant service utilization.

11. Recommendations

For poly makers

- Strengthen female education at least up to secondary education
- Solve problems like emergency transportation during labor and child birth, accessibility of Health facilities to rural women has to get priority

For Planners

- Implementation of all FANC package services in all Facilities has to be emphasized.
- Educate community on benefit of SBA services
- use religion leaders as Institutional Delivery promoters

For Health care provider /Implementers/

- Enable all pregnant women to attend ANC visits with trained and skilled attendant during pregnancy.
- Emphasize on individualized service provided, not on the number of ANC women should attend
- BPCR should have to get high attention as equal to as other services in FANC.
- Involve husbands in FANC visits at least once.

Further research should be done on quality of FANC packeges service provision in ANC visits in Health centers and Hospitals.

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Annex I. English version of the Questionnaire

Study information sheet and consent form

Addis Ababa University School of Public Health

Information Sheet

Good morning/afternoon. My name is ----------and I am part of a team of people who are carrying out a survey on *"Assessment of the effect of FANC on Utilization of skilled delivery attendant at birth in Gomma Wored and Agaro Town among mothers who have attended ANC at health center and deliver in the one year preceding the survey"* (Show a letter of approval from ZHO). You are selected randomly from all pregnant mothers that have attended FANC in the Health centers and expected to deliver in one year prior to this study. We would very much appreciate your participation in this survey. The information from this survey enables the government and other stakeholders to develop programs to improve maternal health services. I would like to ask you some questions and it will take about 30 minutes. Your answers will remain confidential, Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

Name of PI: Shambel Belete

Addis Ababa University

Cell phone: 0913-12 53 38

Email: shambele@gmail.com

Institutional Review Board (IRB)

Addis Ababa University

Tele: 251-111-553-873

Verbal Consent

It has been read to me in the language I understand all conditions stated above. Therefore, I am willing to participate in this study.

Result of interview:

1. Completed 2. Respondent not available 3. Refused 4. Partially completed

Checked by:

Supervisor: - Name _____ Signature_____ Date____/_____/_____

Start time_____; End time_____; Date_____/____/_____

Name of interviewer_____ Signature_____ Date____/_____/_____

IF RESPONDENT DOES NOT AGREE TO BE INTERVIEWED THANK HER AND GO TO THE NEXT RESPONDANTS HOUSE

Addis Ababa University

College of Health sciences

School of Public Health

Questionnaire on Assessment of The Effect of Focused Antenatal care on Utilization of Skilled Delivery Attendant at Birth, among mothers in Gomma woreda and Agaro Town, Oromia Regional state, Ethiopia, 2013.

1 .Households Identification

001. Questionnaire code_____

002. woreda / Town Administration _____

003. Kebele_____ zoonii _____Garee----------

004. Stratum **1-3 FANC Visitor**_____ **≥4 FANC Visitor** _____

005. House number (for urban) _____

I. Respondent's Socio demographic characteristics

No	Questions	Alternative/choice of Response	skip
101	Residence	Urban -------1Semi urban (small Town)-------2Rural----3	
101	Age in years at interview time		
102	Marital status	Married_____1 single_____2 Divorced_____3 separated__4 Widowed_____5	
103	Religion	Orthodox----------1 Catholic----------2 Muslim----------3 Protestant----------4 Other, specify----------88	
104	Ethnicity	Oromo----------1 Amhara----------2 Dawro----------3 Kafa----------4 Other, specify----------88	
105	Occupation	Farmer----------1 House wife---------2 Gov. employee-----3 Private employee---4 Private business-----5 Other, specify----------88	
106	Educational status	Illiterate----------1 Read and write---2 Primary education(1-8)----3 Secondary education & above(9_12+)-------4	
107	Do you have monthly income	Yes----------1 No----------2 I don't want tell -------3	
108	Monthly income in birr		
109	Family size (in no)		
110	Husband's education status	Illiterate----------1 Read and write---2 Primary education(1-8)----3 Secondary education & above(9_12+)-------4	

II. Obstetric factors

No	Questions	Alternative/choice of Response	skip
201	Age at first at marriage		
202	Age at the first pregnancy		
203	Gravidity(total no. of pregnancy)		
204	Parity(Total no of birth)		

205	What was your first reason to visit Health center at first ANC?	Yes No To check the position----------1 2 To check condition/growth of the baby---- 1 2 Problem related to pregnancy----------1 2 To be treated when sick----------1 2 To take tetanus injection----------1 2 Other, specify----------88	
206	How many months did your pregnancy when you attended Your 1st FANC visit?	_____	
207	How many FANC visits did you do?	_____	
208	During ANC follow up did you get any information regarding pregnancy and delivery complication?	Yes---------1 No----------2 I don't ----9	
209	Were you informed about where to deliver?	Yes---------1 No----------2	If No → 302
210	If yes where did they recommend you to deliver?	Health Facility---------1 Home ----------2	
211	Were you informed as who should attend you during delivery?	Yes---------1 No----------2	

III. Practice of respondents during the last delivery

No	Questions	Alternative/choice of Response	skip
301	When did you delivery your last baby	___/_____/_____	
302	Did the birth in the last 12 months resulted in a baby that was born alive or dead?	Live birth----------1 Still birth----------2	
303	Where did you deliver(this specific child)	Home----------1 Health facility-----2 On the way to HF-----3 on the way to referral-----4 Other, specify----------88	If 2→306
304	If it was at home, why did you choose to deliver at home?	Yes No I feel more comfortable just being at home----------1 2 Close attention from relatives & family members ----1 2 It is my usual practice----------1 2 I don't like the service in the health facility----------1 2 Previous bad experience from institutional delivery—-1 2 Un welcoming approach of Health workers---------- 1 2 Other, specify----------88	
305	If you deliver at home who assisted you during delivery?	No attendant----------1 Health professional----------2 Trained TBA----------3 Untrained TBA----------4 Family members & relatives-----5 Other, specify----------88	
306	Have you had any problem while you give birth at home?	Yes----------1 No----------2	→404
307	If it was in health facility, why do you choose to deliver in health facility?	Yes No Better service in the Health Facility---------- 1 2 Close to where I live----------1 2 Better out come from institutional delivery—----------1 2 Poor out comes from home delivery----------1 2 I was informed to deliver in health institution—----------1 2 Other, specify----------88	
308	Which Heath Facility did you use to deliver?	Hospital----------1 Health center----------2 Health station/clinic--------- 3 Health post---------- 4 Other, specify----------88	
309	Who assisted you during delivery?	No attendant----------1 Health officer----------2 Doctor----------3 Midwife & Nurses----------4 Health assistant----------5 Health Ext.Worker-------6 TBA----------7	

IV. Predisposing Factors

A. Beliefs and Attitudes on Health facilities, Home delivery, and delivery attendants

No.	Questions	Alternative choice of response	skip
401	If you deliver at health facility what is your attitude towards delivery services?	Excellent Good Indifferent Fair Bad 1 2 3 4 5	**If 3→407** **If bad 5→403**
402	Why good attitude to the institutional delivery service?	Yes No Better quality of service ---------- ----------1 2 Good approach of health workers----------1 2 Fair price of services----------1 2 Better outcome of institutional delivery ----------1 2 Other specify_____88	
403	Why bad attitude to the institutional delivery Service?	Yes No Poor quality of services ----------1 2 Unable to perform cultural ceremonies----------1 2 Unpleasant approach of health worker ----------1 2 Unfair & expensive price ----------1 2 Poor outcome of services----------1 2 others, specify_____88	
404	If you deliver at home what is your attitude to home delivery?	Excellent Good Indifferent Fair Bad 1 2 3 4 5	**If 3→407** **If 5→406**
405	Why good attitude to home delivery?	Yes No I feel more comfort being at home----------1 2 To get care and attention from family members—----------1 2 To perform cultural ceremonies----------1 2 It is my usual practice ----------1 2 I don't like the services in the health service----------1 2 I have experienced poor outcome of delivery in health facility ----------1 2 Unwelcoming approach of Health workers ----------1 2 Other specify----------88	
406	Why bad attitude to home delivery?	Yes No Better services in health facility ----------1 2 Better outcome of delivery from health facility- ----------1 2 Good approach of Health. workers---------- ----------1 2 Poor out comes from home delivery ---------- ----------1 2 other specify_____88	

B. Perceptions (perceived severity, susceptibility, benefit and barriers)

No.	Questions	Alternative/ choice of response	skip
407	Like any pregnant women ,I am susceptible to face pregnancy & delivery complication	1 2 3 4 5 I strongly agree I agree Indifferent Disagree I strongly disagree	
408	Delivery complication can be sever and may be hazardous to my well being	1 2 3 4 5 I strongly agree I agree Indifferent Disagree I strongly disagree	
409	Delivery complication can be severe and may be hazardous to the new born	1 2 3 4 5 I strongly agree I agree Indifferent Disagree I strongly disagree	
410	Being attended by a skilled delivery attendant may be beneficial to my well being	1 2 3 4 5 I strongly agree I agree Indifferent Disagree I strongly disagree	
411	Being attended by a skilled delivery attendant may be beneficial to the new born well being	1 2 3 4 5 I strongly agree I agree Indifferent Disagree I strongly disagree	

C. Knowledge on pregnancy and delivery complications and services.

No.	Questions	Alternative/ choice of response	skip
412	Are there some problems that can occur during pregnancy and child birth that could endanger the life of a pregnant women	Yes----------1 No ----------2 Don't know----------87	If 2→415
413	Can you mention obstetric problems that can occur during pregnancy? (probe: ask for problems which are not mentioned spontaneously)	Yes No Yes No Vaginal bleeding---------1 2 Severe head ache----------1 2 Blurred vision---------- 1 2 Convulsion----------1 2 High fever---------- -1 2 Marked and fast weight gain—1 2 Loss of consciousness---1 2 Severe abdominal pain—---------1 2 Others, specific----------88	
414	Are there some obstetric problems that can occur during a labor and child birth that could endanger the life of a pregnant mother? (probe: ask for problems which are not mentioned spontaneously)	Yes No Yes No Sever vaginal bleeding--------1 2 Severe headache---------1 2 Convulsion----------1 2 Higher fever----------1 2 Loss of consciousness---------1 2 Laboring lasting >12 hours—1 2 Placenta not delivered after 30minutes baby is delivered----------1 2 Other specify----------88	
415	What do you think the advantage of pregnancy and delivery related service?	Yes No For anticipating problem----------1 2 For early detection of health problems----------1 2 For appropriate management of health problem----------1 2 For better health care for the women----------1 2 For the better care to the new born----------1 2 Other specify----------88	

V. Enabling Factors (Availability & Accessibility of service)

No.	Questions	Alternative/ choice of response	skip
501	Is there a health facility with skilled delivery attendant in your nearby?	Yes----------1 No----------2 Don't Know----------87	
502	Can you afford to pay for services from skilled delivery attendant	Yes----------1 No----------2 Don't Know----------87	
503	Have you heard that Health centers refer mothers to higher Health Facility?	Yes----------1 No----------2 Don't Know----------87	
504	How long does it to travel from your home to the nearest health facility which gives delivery service?	30 minutes ----------1 One hour----------2 >1 hour ----------3	
505	Do you have access to maternal and child health information	Yes----------1 No----------2	**If 2→601**
506	If yes to Qsn No.505, what is the source of the information	Radio----------1 TV----------2 News paper----------3 Health workers----------4 Others , specify----------88	

VI. Reinforcing Factors (Influence and social support)

No.	Questions	Alternative/ choice of response	skip
601	What was the preference of your husband to your place of delivery?	Home delivery----------1 Institutional delivery----------2 Other, specify----------88	
602	What was the preference of your husband about your delivery attendant?	Skilled delivery attendant----------1 TTBA----------2 TBA----------3 Family members & Relatives-------4 Others, specify----------88	
603	What was the preference of other family members about your place of delivery	Home delivery----------1 Institutional delivery----------2 Other, specify----------88	
604	What was the preference of other family members about your delivery attendant	Skilled delivery attendant---------1 TTBA----------2 TBA----------3 Family members & Relatives-------4 Others, specify----------88	
605	What was the preference of other community members as your place of delivery	Home delivery----------1 Institutional delivery----------2 Other, specify----------88	

VII. Women Decision Making Power

No.	Questions	Alternative/ choice of response	skip
701	Who make decision to visit ANC at HC?	Just myself----------1 my husband-------2 My mother----------3. mother in law—---4 H/professional------5 Relatives-------6 Other, specify----------88	
702	If you gave birth at Health facility, who make the final decision to deliver In Health Facility?	Just me----------1 My husband/partner---------2 My family & relatives --------3 Health professional----------4 Other, specify----------88	
703	If you gave birth at Home, who make the final decision to seek help when you have problem?	Just me----------1 Husband and/partner--- ----2 My family & relatives--------3 Health professionals---------4 TBA---------- -5 Others, specify----------88	

VIII. Service uptake information of Respondent's during FANC visits.

No	Questions	Alternative/choice of Response	skip
801	What was your main reason to visit Health Center on first ANC visit?	Yes No For ANC----------1 2 Pregnancy related complication----------1 2 For treatment of other diseases----------1 2 Other,specify----------88	
802	Did you screened for any complications and diseases during your FANC visits?	Yes----------1 No----------2	If 2→06
803	If yes for Qsn 802, For which complications and diseases?	Yes No HIV ----------1 2 STI ----------1 2 Malaria ----------1 2 Vaginal Bleeding----------1 2 TB----------1 2	
804	Did you treated for these complications and existing diseases?	Yes----------1 No----------2	
805	If yes for 804, for which disease you treated? (Probe)	Yes No Yes No HIV ----------1 2 STI ---------1 2 Malaria ----------1 2 Vaginal Bleeding—1 2 TB----------1 2 Malnutrition--------1 2 Anemia----------1 2 Hypertensive disorder-1 2 Malposition after 36wk—1 2 Fetal Distress----------1 2	
806	Have you received preventive intervention related to pregnancy? (Probe)	Yes ---------1 No----------2	If806 is 2 →808
807	Which preventive intervention you received? (probe)	Yes No TT prophylaxis----------1 2 Iron Folate supplementation----------1 2 Treatment for hook worm----------1 2 Iodine supplementation----------1 2	
808	Have you received counseling on "Birth preparedness and complication readiness" during your FANC visits?	Yes----------1 No----------2	
809	On which BPCR you counseled? (probe)	Yes No A skill provider to be present at the birth----------1 2 The place of delivery and how to get there----------1 2 Items needed for delivery----------1 2 Need to save money ----------1 2 A person designated to make decision ----------1 2 A way to communicate with a source of help--------1 2 A source of emergency funds----------1 2 Emergency transportation----------1 2 Blood donors----------1 2	
810	Which BPCR component you implemented during your pregnancy and labor period?	Yes No A skill provider to be present at the birth----------1 2 The place of delivery and how to get there----------1 2 Items needed for delivery----------1 2 Need to save money ----------1 2 A person designated to make decision ----------1 2 A way to communicate with a source of help-------1 2 A source of emergency funds----------1 2 Emergency transportation----------1 2 Blood donors----------1 2	

Annex II. Afan Oromo version of the Questionnaire

Gaaffii Qoranno

Odeeffannoo fi Heeyyama Qoranno

Univarsitii Addis Ababaa

colleejii Saayiinsii Fayyaa

mana Barumsaa Fayyaa Hawaasaa

Odeeffanno Qorannichaa

Akkam bultan/oltan.maqaan koo----------jeedhama, Miseensa garee namoota qorannoo "Haadhoolii hordooffii dura da'umsaa Buufataalee fayyaa Aanaa Gommaa fi Magaalaa Aggaaroo keessattii hordoofaa turanii fi waggaa tokko darbee keessatti dahaan bu'aa hordooffiin dura da'umsaa itti fayya dama tajaajila da'umsaa ogeessaan keennamu yeroo da'umsaa fayyadamu irratti qabu " (xalayaa heeyyamaa WFG Agarsisii) ti.Isiin dubartoota ulfaa hordooffi dura da'umsaa buufataalee fayyaa keessatti gaggeessaa turanii fi waggaa darbee keessatti dahaan keessaa carraadhaan filatamtan. Qarannoo kana irratti hirmaachu keessaniif baay'ee isiin galateeffanna.odeeffannoon qo'annoo kana irraa argamu motummaa fi qooda fudhattoota kan biro sagantaalee tajaajila qopheessu fi fayyaa haadhoolee foyyeessuuf baay'ee gargaara.Gaaffilee muraasa kan daqiqaa 30 keessatti deebi'aniin isiin gaafadha.Deebiin keessan iccitidhaan qabama.Hirmaannaan qorannoo kana keessatti taasisfamu feedhidhaani akasuumas gaafiilee hunda ykn walakaa deebiisu dhisudhaaf mirga qabdu.Haata'u malee,yaadnii isiin nuuf keennitan baay'ee barbaaachisaa waan ta'eef akka qorannoo kana irratti hirmaattan abdii qabna.

Qorataa:- shaambal Ballaxaa

Yunivarsiti Addis Ababa

Lakk.Mob.:0913125338

Emeeyiilii: shambele@gmail.com

Boordii keessadeebii dhaabbatichaa

Yunivarsitii Addis Ababa

Lakk.Bilbilaa\;251-111-553-873

Waligaltee Afaanii

Dhimmoonni armaan olitti eraman hundumtu afaan ani beekuun naaf duubbiifamaniru.Kanaafu,qorannoo kana irratti hirmaachuuf feedhii koti.

Bu'aa gaaffi fi deebii

1.xummurameera 2. Mana Hinjiranu 3. Didaniiru 4. Walakkaa isaa deebiisan

Kan mirkaneesse:

To'ataa:- Maqaa----------mallattoo----------Guyyaa--------/--------/------

Yeroo itti jalqabame----------kan itti xummurame----------Guyyaaa----------/------/-------

Maqaa Gaafataa----------mallattoo----------guyyaa----------/----------/--------

YOO GAAFATAMAAN DIIDAN GALATEEFFADHU GAAFATAMAA MANA ITTI AANUTT DEEMII.

Yunivarsitii Addis Ababa

Kolleejii saayiinsii Fayyaa

Mana Barumsaa Fayyaa Hawaasaa

Gaafilee Bu'aa Hordooffiin Duura Da'umsaa itti fayyadama tajaajila da'umsaa ogeessaan keennamu yeroo da'umsaa fayyadamu irratt qabu haadholii Etiyopiyaa,Naannoo Oromiyaa,Aanaa Gommaa fi Magaalaa Aggaaroo tti argaman,2005.

1.Eenyummeessaa Abbaa warraa

001. lakk.Addaa Gaaffii_____

002. Aanaa/Bulch.Magaalaa

003. Ganda----------Zoonii Gandaaa_____Garee misoomaa----------

004. Qooddii 1-3 ANC hordoofan_____≥4 ANC hordoofan_____

005. lakk.manaa (magaalootaaf)_____

I. Haala Hawaas-dinagdee nama gaafatamu

Lakk	Gaafilee	Fiilannoo/Fiilannoo deebii	Irra Darbii
101	Iddoo jireenyaa	Magaala -------1 magaalaa(xiqqaa)-------2 Baadiyyaa----3	
101	Umrii waggaadhaan yeroo gaaffi fi deebidhaa		
102	Haala fudhaa fi heerumaa	Kan heerumtee_____1 Hinheerumne_____2 Kan hiktee_____3 kan adda jiraatu__4 Kan manatti deesse_____5	
103	Amantii	ortodoksii----------1 Katolikii----------2 Muslima----------3 Protestantii----------4 Kan biroo, ibsii----------88	
104	Sabummaa	Oromo----------1 Amhara----------2 Dawro----------3 Kafa----------4 kanbiroo, haacaqafamu----------88	
105	Hojii	Q/Bultu----------1 Haadha/ Giiftii manaa---------2 Hoj.Motumma-----3 Hoj.dhaab.dhunfaa---4 Hoj.dhunfaa-----5 Kan biroo, ibsii----------88	
106	Sadarkaa barumsaa	Kan hinbarannee----------1 Dubbisu fi barreessu---2 Sad.1ffaa (1-8)----3 Sad.2ffaa fi isaa ol (9_12+)-------4	
107	Galii ji'aa qabdu/	Eeyeen----------1 lakki----------2 Himu hinbarbaadu -------3	
108	Monthly income in birr		
109	Baayina maati (in no)		
110	Sadarkaa barumsaa abbaa warraa/dhirsaa	Kan hinbaranne----------1 dubbisu fi barreessu---2 Sad,1ffaa (1-8)----3 Sad.2ffaa fi isaa ol (9_12+)-------4	

II. Dhimmoota Dahumsaan walqabatani

lakk	Gaafilee	Filannoo/fiilannoo deebii	Irra Darbi
201	Umrii yeroo heeruma jalqabaa		
202	Umrii yeroo ulfa jalqabaa		
203	Baayyina ulfaa		
204	Baayyina Dahumsaa		
205	Yeroo hordooffi ulfaa jalqabaa Buufata fayyaa dhaqudhaaf sababni kee inni jalqabaa maal ture?	Eeyeen Lakki Haala taa'umsaa ulfaa lalchiisuuf----------1 2	

		Haala/Guddina ulfaa laalchiisuuf ---- 1 2 Rakko ulfaan walqabateef----------1 2 Yeroo dhukkubsadhu yaalamuuf----------1 2 Lilmo qollee gogsaa waraanachuuf---------1 2 Kan biroo,ibsii----------88	
206	How many months did your pregnancy when you attended Your 1st FANC visit?	_____	
207	Hoordooffii dura da'umsaa/HDD meeqa raawwattee?	_____	
208	Yeroo HDD Rakkoowaan ulfaa fi dahumsaan walqabatan ilaachisee odeeffannoon argattan jiraa?	Eeyeen---------1 Lakki----------2 Hinbeeku ----9	
209	Eessatti dahuu akka qabdan isiinitti himameeraa?	Eeyeen---------1 Lakki----------2	If No → 302
210	Eeyeen yoo jeettan,Eessatt akka deessan isiiniitti himan?	Dhaabbata Fayyaatti------1 Manatti ---------2	
211	Eeynu akka isiin deesisu qabu isiinitti himameeraa?	Eeyeen---------1 lakki----------2	

III. Gochaa deebiisaa waytii dahumsa dhumaa

lakk	Gaafilee	Filanno/filanno deebii	Irra darbi
301	Mucaa keessan isa dhumaa yoom deessan?	____/_____/_____	
302	Mucaan ji'oota daraban 12 keessatti dhalatee lubudhaani moo du'ee dhalate?	Lubbudhaan dhallate----------1 Du'ee dhalate----------2	
303	Eessatt deessan (mucaa kana)	Manatti----------1 Dhaabbata Fayyaatti----------2 Gara Dhaabbata fayya osoon deemaa jiru-----3 Refaraalaaf osoon deema jiru----------4 Kan biroo, ibsii----------88	If 2→306
304	Yoo manatti ta'ee, maaliif manatti dahu filattan?	Eeyeen Lakki Mana ta'uu kootiif natty toola----------1 2 Xiyyeeffannaa dhiyoo maatii fi firaan qaba ----------1 2 Wanta yeroo mara godhu dha----------1 2 Tajaajila dhaabiilee fayyaa hinjaalladhu----------1 2 Muxanno gadhee ammaan dura dahumsa dhaabbilee fayyaa keessatti qabu ----------1 2 Haallii simannaa ogeeyyii fayya gaarii miti---------- 1 2 Kan biroo, ibsii----------88	
305	Manatti deesse yoo ta'ee, enyuutu sii deesisee?	Deessistun hin turree---------1 ogeessa fayyaa----------2 Deessiftu aadaa leenjite-------3 Deessiftu aadaa hin leenjine---4 Miseensa maatii fi fira-----5 Kan biroo, ibsii----------88	
306	Yeroo manatti deesse rakkoon sii qunname jira ture?	Eeyeen ----------1 lakki----------2	→404
307	Yoo DHaabbat fayyaatti deesse ta'ee, dhaabbata fayyaati dahu maaliif filatte?	Eeyeen lakki Tajaajila foyya'aa dhaabbilee fayyaa---------- 1 2 Mana kotti dhiyoo dha----------1 2 Bu'aa foyya'aa dahumsa dhaabbilee fayyaa keessaa-------1 2 Bu'aa gaarii hintaanee dahumsaa manaatiraa----------1 2 Dh/ fayyaa keessatti akkan dahu natti himame ture---------1 2 Kan biroo, ibsii----------88	
308	Dahumsaaf dhaabbata fayyaa kam filatte?	Hospitaal----------1 B/Fayyaa----------2 Kilinika ---------- 3 K/Fayyaa---------- 4 Other, specify----------88	
309	Eenyuutuu siideesisee?	Deessistun hin turre----------1 Qondaala Fayyaa----------2 Doktora----------3 Nursi Deesistu ykn Nursii ----------4 Gargaaraa fayyaa----------5 ekisteenshi fayyaa -------6 TBA----------7	

IV. Dhimmoota Haal-duree

A. Amantaa fi ilaalcha Dhaabbilee fayyaa,manaatti dahu fi deessistootaaf qaban.

lakk.	Gaafilee	Filanno/ filannoo deebii	Irra darbi
401	Dh.F'tti deessan yoo ta'ee ilaalchii isiin tajaajila dahumsaatiif qabdan maal fakkaata	B/B/Gaarii B/Gaarii hinbeeku Gaarii Gadhe 1 2 3 4 5	**If 3→407** **If bad 5→403**
402	Tajaajila Dahumsaa dhaabbata fayyaatiif maaliif ilaalcha gaarii qabaattan?	Eeyeen Lakki Tajaajila qulqullina gaarii qabu ----------1 2 Simannaa garii ogeessoota fayyaa----------1 2 Kaffaltii foyya'aa tajaajilaa----------1 2 Bu'aa gaarii tajaajila dahumsaa Dh.Fayyaa--- ----------1 2 Kan biraa, ibsii_____88	
403	Tajaajila Dahumsaa DH.F tiif maaliif ilaalcha gadhe qabaattan?	Eeyeen Lakki Tajaajila qulqullina hin qabnee ----------1 2 Qophiiwwan aadaa qopheessu hindanadeenyee----------1 2 Simannaa ogeeyyi fayya nama hingammachifnee ----------1 2 Kaffaltii olaanaa fi sirri hintaane ----------1 2 Bu'aa dadhabaa tajaajilaa----------1 2 Kan biraa, ibsii_____88	
404	Manatti deessan yoo ta'ee,ilaalchi isiin manatti dahuuf qabdan maal fakkaata?	B/B/Gaarii B/Gaarii hinbeeku Gaarii Gadhe 1 2 3 4 5	**If 3→407** **If 5→406**
405	**Dahuumsa manaatiif maaliif ilaalcha gaarii qabaattan?**	Eeyeen Lakki Mana ta'u kootiif baay'ee natt I toola----------1 2 Kununsaa fi xiyyeeffannaa maatii argachuuf----------1 2 Sirnoota aadaa raawwachuuf----------1 2 Wantan yeroo hunda raawwadhu dha ----------1 2 Tajaajila dhaabbilee fayyaa hin jaalladhu----------1 2 Dhaabbilee fayyaa irraa muxannoo bu'aa dahumsaa gaarii hintaaneen qaba ----------1 2 Simannaa ogeeyyii fayyaa gaarii hin taanee ----------1 2 Kan biraa, ibsii----------88	
406	Dahumsa manaatiif maaliif ilaalcha gadhe qabaattan?	Eeyeen lakki Tajaajila foyya'aa DH.F ----------1 2 Bu'aa gaarii dahumsaa Dh.F---------- ----------1 2 Simannaa gaarii ogeessoota fayyaa---------- ----------1 2 Bu'aa dadhabaa dahumsa manatti taasifamu ---------- ----------1 2 Kan biraa, ibsii_____88	

B. Hubanno (hubannoo haameenyummaa, saaxilamummaa, faayidaa fi hudhaalee)

No.	Questions	Filanno/ filannoowwan deebii	Irri darbii
407	Akkuma dubartii ulfaa tokkootti ,rakkoowwan ulfaa fi dahumsaan walqabataniif saaxilamtu dha.	1 2 3 4 5 Baayiseen waligala waligalla Homaayyu waligalu baayyeen morma	
408	Rakkoon dahumsaan walqabatee dhufu haamaa fi jireenya kootiif balaa ta'u danda'aa.	1 2 3 4 5 Baayiseen waligala waligalla Homaayyu waligalu baayyeen morma	
409	Rakkoon dahumsaan walqabatee dhufu haamaa fi jireenyasabiyyi reefu dhalateef balaa ta'u danda'aa.	1 2 3 4 5 Baayiseen waligala waligalla Homaayyu waligalu baayyeen morma	
410	Ogeessaan dahuun koo jireenya kootiif faayidaa qabaachu danda'a	1 2 3 4 5 Baayiseen waligala waligalla Homaayyu waligalu baayyeen morma	
411	Ogeessaan dahuun koo jireenya sabiyyitiif faayidaa qabaachu danda'a	1 2 3 4 5 Baayiseen waligala waligalla Homaayyu waligalu baayyeen morma	

C. Beekumsa rakkoowwan ulfaa fi dahumsaan walqabatan irratti qabanii fi tajaajiloota

lakk.	Gaafilee	Filannoowwan Debii	Irra darbi
412	Rakkoowwan yeroo ulfaa fi dahumsaa lubbu haadhaa balaadhaaf saaxilu danda'aan jiru?	Eeyeen----------1 Lakki ----------2 Hinbeeku----------87	If 2→415
413	Rakkoowwan yeroo ulfaa qunnamu danda'aan ibsu dandeessaa?(kan asirratti hinbarreeffaminis yoo jiraatan gaafadhu)	Eeyeen lakki Eeyeen lakki Dhiguu qaamaa saalaa---------1 2 Mataa bowoo cimaa-------1 2 Sirritti argu dadhabu---------- 1 2 Gaggabsisu----------1 2 Gubaa qamaa haamaa------ -1 2 ulfaatini qaamaa garmalee fi saffisaan dabalu—1 2 Ofwalaalu----------1 2 Dhukkubbi garaa cimmaa—----1 2 Kan biraa, ibsii----------88	
414	Rakkoowwan fayyaa yeroo cininsu fi dahumsaa qunnamu danda'aani fi lubbu haadhaa balaas saxiilan jiru?(kan hinbarreeffamin yoo jiraate gaafadhu)	Eeyeen lakki eeyeen lakki Dhiguu qaama saalaa--------1 2 Mataa bowoo cimaa---------1 2 Gaggabsisu ----------1 2 Gubaa qaamaa cimaa------1 2 Ofwalaalu ----------1 2 cininsu sa'aati 12 oli ----------1 2 Mucaan dhaltee daqiiqaa 30 booda obaatiin ofkalu didu----------1 2 Kan biraa, ibsii----------88	
415	Faayidaan tajaajila ulfaa fi dahumsaan walqabatu maal jette yaadda?	Eeyeen lakki Rakkoolee dursani beekuuf----------1 2 Rakko fayyaa dursani/osoo hincimin/ sakkatta'uuf----------1 2 Yaalii sirrii rakkoo fayyaa argachuuf----------1 2 Kununsa fayyaa foyya'aa haadhaatiif----------1 2 Kununsa fayyaa foyya'aa sabiyyitiif----------1 2 Kan biraa, ibsii----------88	

V. Haala mijaawaa (jiraachu fi itti fayyadamuuf mijaawaa ta'u tajaajilaa)

lakk.	Gaafiilee	Filannoowwan deebii	Irra darbi
501	Dhabbanni fayyaa ogeessa gahumsa deessisu qabu qabu siitti dhiyoo jiraa?	Eeyeen----------1 lakki----------2 Hin beeku----------87	
502	Kafaltii Tajaajila dahumsaa ogeessaan keenamu argachuuf kaffalamu raawwachu dandeessaa?	Eeyeen----------1 lakki----------2 Hin beeku----------87	
503	Buufanni fayyaa haadhoolii gara DH.F olaanatti akka ergu dhageessee beektaa?	Eeyeen ----------1 lakki----------2 lakki----------87	
504	Mana keetirraa haanga DH.F dhiyoo tajaajila dahumsaa keennu deemuuf haangam fuudhata?	30 daqiiqaa ----------1 sa'aatii 1----------2 >1 sa'aatii ----------3	
505	Odeeffannoo fayyaa hodhoolii fi daa'immani irratti argachuuf haala mijaawaa qabdaa?	Eeyeen ----------1 lakki----------2	**If 2→601**
506	Gaafii 505 eeyee yoo ta'ee,Maddii odeeffannoo kee maalii?	Radiyoo----------1 TV----------2 Gaazeexaa----------3 Ogeeyyii fayyaa----------4 Kan biraa , ibsii----------88	

VI. Gargaarsa (dhibbaa and gargaarsa hawaasaa)

lakk.	Gaafilee	Filannoowwan Deebii	Irra darbi
601	Bakka dahumsaa ilaalchise filannoon abbaa warraa keessani eessa ture?	Manatti dahu----------1 Dhaabbata fayyaatti dahu----------2 Kan biraa, ibsii----------88	
602	Deessistu ilaalchisee filannoon abbaa warraa keessan eenyu ture?	Deessistu gahumsa qabdu----------1 Deessistu Aadaa leenji fudhatte----2 Deessistu Aadaa----------3 maatii fi fira----------4 Kan biraa, ibsii----------88	
603	Bakka Dahumsaa ilaalchisee filannoon maatii keessanii isa ture?	Manatti dahu----------1 Dhaabbata Fayyaatti dahu----------2 Kan biraa,ibsii----------88	
604	Deessistu ilaalchisee filannoon maatii keessani eenyu ture?	Deessistu gahumsa qabdu---------1 Deessistu aadaa leenjii fudhatte-----2 Deessistu aadaa----------3 maatii fi fira----------4 Kan biraa,ibsii ----------88	
605	Hawaasni naannoo keessani bakka dahumsaa kam isiinii filatee?	Manatti dahu----------1 dhaabbata fayyaatti dahu----------2 Kan biraa, ibsii----------88	

VII. Aangoo murtii keennu dubartootaa

lakk.	Gafilee	Filannoowwan deebii	Irra darbii
701	Hordooffi dura dahumsaa B/Fayyaatti akka hordooftu eenyutu murteesse?	Anuma----------1 abbaa warraa kooti----------2 Haadha kooti----------3. Aamaatii/haadha abbaa warra koot—---4 Ogeessa fayyaa------5 firoottan koti----------6 Kan biraa, ibsii----------88	
702	Dhaabbata fayyaatti deessee yoo ta'e,murtee dhumaa akka Dh.F'tti deessu kan murteessee eenyu?	Anuma----------1 A/warraa kooti---------2 Maatii fi firoottan kooti --------3 ogeessa fayyaa----------4 Kan biraa, ibsii----------88	
703	Manatti deessee yoo ta'ee,murtee dhumaa akka manatti deessuuf kan murteesse eenyu?	Anuma----------1 A/warraa koti----------2 Maatii fi firoottan kootii--------3 ogeessa fayyaa----------4 Deessistu aadaa----------5 Kan biraa, ibsii----------88	

VIII. Odeeffanno fayyadama tajaajila Hordooffi Dura dahumsaa xiyyeeffamaa (FANC)

Lakk.	Gaafilee	Filannoowwan deebii	Irra darbi
801	Hordooffi dura dahumsaa 1ffaa irratti sababni jalqabaa B/Fayyaa akka dhaqxuu sii taasiisee maal ture?	Yes No Hoordooffi Dura dahumsaatiif----------1 2 Rakkoo ulfaan walqabatee naqunnameef------1 2 Dhukkuba kan biraa yaalamuuf----------1 2 Kan biraa,ibsii----------88	
802	Waaqtii hordooffi dura dahumsaa xiyyeeffamaa rakkoowwani fi dhikkuboota adda addaatiif sakatta'amtani jirtu?	Eeyee----------1 lakki----------2	If 2→06
803	Gaaffii 802 eeyeen yoo ta'e,rakkoo fi dhukkuba kam sakatta'amtan?	Yes No HIV ----------1 2 Dhukk.nafsaalaa ------ --------1 2 Busaa ----------1 2 Dhiguu qaama saalaa---------1 2 Dhukk.sombaa----------1 2	
804	Rakkoowwani fi dhukkuboota kanaaf yaalii argatani?	Eeyeen----------1 lakki----------2	
805	Gaaffii 804 eeyeen yoo ta'e,rakkoo fi dhukkuba kam yaalamtan? (kan hinbarreeffamiin tarreessi)	Eeyeen lakki eeyeen lakki HIV ----------1 2 Dhukk.nafsaalaa ---1 2 Dhukk.Busaa ----1 2 Dhiguu qaama saalaa—1 2 Dhukk.sombaa---1 2 Haanqina nyaataa----1 2 Haanqina dhigaa----1 2 Baayyina dhigaa-----1 2 Taa'umsa ulfaa sirri midhaa ulfaa------1 2 hintaane torbee 36 booda—1 2	
806	Tajaajiloota ittisa dhukkubaa ulfaan walqabatani argattani jirtu?	Eeyeen ---------1 Lakk----------2	If 2→808
807	Tajaajila ittisaa dhukkubaa kam argatttan?(kan hin barreffamin tarreessi)	Eeyee lakki Qollee gogsaa(TT)----------1 2 Raabsa Iron Folate ----------1 2 Yaalii hook worm----------1 2 Raabsa Iodini---------- ----------1 2	
808	Waqtii hordooffi Dura dahumsaa xiyyeeffatame ,Goorsa "Qophii dahumsaa fi qophaa'ummaa rakkoo " argattani jirtu?	Eeyeen----------1 lakki----------2	
809	'Qophii dahumsaa fi qophaa'ummaa rakko' kam irratti gorsa argattan?(kan biraa yoo jiraatee tarreessi)	Eeyyen lakki Ogeessa deessistu yeroo dahumsaa argamu qabu--1 2 Bakka dahumsaa fi haala achi itti gahu----------1 2 Meeshaalee dahumsaaf barbaachisan----------1 2 Barbaachisumma qarshii kufachuu ----------1 2 Yeroo cininsuti Nama murtee keennu filachu -----1 2 Mala deeggartootaan itti walqunnaman----------1 2 Madda qarshii yeroo tasaa----------1 2 Geejjiba yeroo tasaa qopheeffachu----------1 2 Nama Dhiiga keenuu danda'u qopheeffachu------1 2	
810	'Qophii dahumsaa fi qophaa'ummaa rakko' kam hojirra olchitan?	Eeyeen lakki Ogeessa deessistu yeroo dahumsaa argamu qabu--1 2 Bakka dahumsaa fi haala achi itti gahu----------1 2 Meeshaalee dahumsaaf barbaachisan----------1 2 Barbaachisumma qarshii kufachuu ----------1 2 Yeroo cininsuti Nama murtee keennu filachu -----1 2 Mala deeggartootaan itti walqunnaman----------1 2 Madda qarshii yeroo tasaa----------1 2 Geejjiba yeroo tasaa qopheeffachu----------1 2 Nama Dhiiga keenuu danda'u qopheeffachu------1 2	

Annex III. Form to retrieve sampled mothers from HCs and trace for interview.

ANC Reg. No.	MRN	Name of client	Name of Health facility	Kebele	Gare	Age	ANC Visit No.	EDD	Gravid	Parity	No. of children alive	Marital status