

# Utilization of institutional delivery service and associated factors among women who gave birth in the last 12 months in Gondar town, North West Ethiopia, 2019.

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## Research note

**Keywords:** Institutional delivery, Community, Gondar, Ethiopia

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# Abstract

**Abstract Objective:** The aim of this study was to assess magnitude of institutional delivery utilization and associated factors among mothers who gave birth in the last 12 months in Gondar town, North West Ethiopia, 2019. **Results:** The proportion of institutional delivery utilization in this study was found to be 85.9%. Variables which were positively associated with the response variable were: Residence of the mother (AOR=3.2, 95% CI: 1, 6.4), Experience of previous bad obstetrics history (AOR=2.3, 95% CI: 1.2, 4.7), Ownership for source of information like TV/radio (AOR=3.3, 95% CI: 1.9, 5.9), Maternal educational status (AOR=17.3 95% CI: 4.2, 71.2) and average monthly income greater than 160.7 USA dollars (AOR=2.4, 95% CI: 1.1, 5.3). Authors for this study recommend to the maternal and child health care providers to be well linked to the health extension workers so that they may facilitate the pregnant mothers from the rural area to give birth in the health institution and so that institutional delivery utilization can be more than this figure. **Key words:** Institutional delivery, Community, Gondar, Ethiopia

## Introduction

Institutional delivery is a delivery that has taken place in medical facility owned by skilled delivery assistance(1).

Worldwide, an estimated 287,000 maternal deaths occur every year among which, almost all, (99%) are from developing countries(2). Similarly, approximately 830 women died every single day due to complications during pregnancy or childbirth in 2015 (3).

Between 1990 and 2015, the global maternal mortality ratio (MMR) decreased by 44%, from 385 to 216 maternal deaths per 100,000 live births. Despite this progress, the world's program of the Millennium Development Goals(MDGs) which was with the target of a 75% reduction in the global MMR by 2015 has failed (4). Maternal mortality reduction remains a priority under Goal 3 of sustainable development goals of the new world program which talks about ensuring healthy lives and promote well-being for all at all ages in the new sustainable development goals (SDGs) agenda through 2030. In February 2015, the World Health Organization published Ending preventable maternal mortality (EPMM) Strategies, a direction-setting report outlining global targets and strategies for reducing maternal mortality under the SDGs(4). According to SDG Target 3.1, Reducing the global MMR from 216 per 100,000 live births in 2015 to less than 70 per 100 000 live births by 2030 with a supplementary national target that no country should have an MMR greater than 140 per 100,000 live births which requires a global annual rate of reduction of at least 7.5% (3).

Worldwide, the major causes of maternal mortality are hemorrhage (24%), infection (15%), unsafe abortion (13%), prolonged labor (12%) and eclampsia (12%) whereas primary causes of maternal mortality in Africa are hemorrhage (34%), other direct causes (17%), infection (10%), hypertensive disorders (9%) and obstructed labor (4%), abortion (4%) and anemia (4%)(5). In Ethiopia, top four causes of maternal mortality in the year 1980–1999 were abortion related complications (31%), obstructed

labor/uterine rupture (29%), sepsis/infection (21%) and hemorrhage (12%). In the last decade, however, the top four causes of maternal mortality were obstructed labor/uterine rupture (36%), hemorrhage (22%), hypertensive disorders of pregnancy (19%) and sepsis/infection (13%)(6). Most maternal deaths are preventable because of the necessary medical interventions are well known. It is therefore crucially important to increase women's access to quality care before, during and after childbirth. In 2016, millions of births globally were not assisted by a trained midwife, doctor or nurse, with only 78% of births were in the presence of a skilled birth attendant(3).

Maternal mortality remains high in the developing world. Reduction of maternal mortality is a global priority particularly in developing countries including Ethiopia where maternal mortality ratio is one of the highest in the world (412/100,000). The key to reducing maternal mortality ratio and improving maternal health is increasing attendance by skilled health personnel throughout pregnancy and delivery. Skilled assistance during childbirth is a critical strategy to reducing maternal mortality (7, 8).

In despite of skilled delivery is one of the most tracked Millennium Development Goal indicators, the proportion of births attended by skilled health personnel in Ethiopia is very low(9). According to EDHS 2011 report nine women in every ten deliver at home in Ethiopia. As a result, Ethiopia is one of the six countries that contributes' to more than 50 % of worldwide maternal deaths. While it is revealed that delivery attended by skilled provider at health facility reduced maternal deaths, around three quarter of all births in Ethiopia takes place at home (according to EDHS 2016,around 74%)(10).

Giving birth in a medical institution under the care and supervision of trained health-care providers promotes child survival and reduces the risk of maternal mortality(11).

## **Methods**

### **Study design and setting**

A community based cross sectional study was conducted from March to April, 2019 to assess the magnitude of institutional delivery service utilization and associated factors among women who gave birth in the last 12 months in Gondar town. Gondar town is located 725 kilometers, North West from the capital city of Ethiopia (Addis Ababa). According to the recent administration report, the town has 25 kebeles. There are five health centers and one teaching and referral Hospital serving the catchment population. According to 2007 central statistics agency (CSA), the town had an estimated population size of 206,987(108, 902 were females) and the rest were males.

### **Sample size and sampling procedures**

The required sample size was determined by single population proportion formula with the assumptions of 5% margin of error (d), 95% confidence interval (CI) and proportion(P) of 78.8% taken from a research

done in Bahir Dar(12) and adding 10% non-response rate. Then,  $n = ((z_{\alpha/2})^2 \cdot p(1-p)) / d^2$ , the sample size became 257 and with the 10% non-response rate, it was totaled as 283. Since we have used two stages of the sampling technique to get the study participants, we used a design effect of 2, multiplied by 283, total sample size became 566.

Multistage sampling technique was used to select the study participants. There were urban and rural kebeles. There was only one urban and 24 rural kebeles during the study time. The, the rural kebele and 3 urban kebeles from 24 were selected by lottery method. For the selected four kebeles, we conducted a house-to-house visit to identify households with eligible women and 1236 households were found with eligibility. Households from each kebele were selected again by systematic random sampling using K interval of 2 from those houses coded during a house to house visit and if we got a closed house or the mother was not available at the time of collection, the data collectors frequently visited till end of data collection and if the mothers still not found till then, the next house was taken.

## Operational definition

*Home delivery*: -when a mother gave birth at her home or other's home (traditional birth attendance home, neighbor, relatives, families) or birth takes place outside health institution or birth assisted by TBA (27).

*Institutional delivery service utilization*: -when a mother gave birth in health facility assisted by skilled health provider(1).

## Data collection procedures and tools

Data were collected using a semi-structured, pre-tested and interview based questionnaire adapted from the literatures. It was prepared in English and translated into local language Amharic and finally returned to English by English language expertise.

## Data quality control

Clarity of the tool was tested before the final utilization. The pretest was conducted among 5% of the sample size in the other Kebele. A one day training was given for data collectors and supervisors regarding the objectives of the study, data collection method and significance of the study. During data collection, each data collector was supervised for any difficulties and directions and necessary corrections were provided.

## Data processing and analysis

All collected data were rechecked for completeness, coded and entered using Epi Info 7.2, and exported to SPSS version 23 for cleaning and analysis. Bivariable logistic regression was employed to identify association, and multivariable logistic regression model was used to control the effect of confounders.

Variables having P-value less than 0.05 in the Bivariable analysis were fitted into the multivariable logistic regression model. 95% CI and odds ratio were computed and variables having P-value less than 0.05 in the multivariable logistic regression analysis were considered to declare statistical significance.

## Results

### Socio-demographic characteristics

In this study 562 mothers were interviewed which makes the response rate 99.3%. The mean age of the respondent was 29. Majority 512 (91.1%) of respondents were urban dwellers. 518 (92.2%) of respondents were married. Majority 519 (92.3%) of mother were from Amhara ethnic group (*Table 1*).

### Obstetrical and maternal characteristics

In this study, the mean age at first marriage and age at first pregnancy were 19.5 and 22 years respectively. More than one third, 200(35.6%) of the participants were primiparous. Out of 562 respondents about 502(89.3%) had attended ANC. Four hundred eighty two (85.9%) of mothers gave birth in health facilities (*Table2*).

### Factors associated with the response variable

*Bivariate analysis showed that:* Residence, Maternal educational status, Monthly income, Availability of TV/radio, Age at 1<sup>st</sup> marriage, Experience of bad obstetrics history and gestational age at 1<sup>st</sup> ANC visit were crudely associated.

*Independently and positively associated variables in adjusted analysis were:* Maternal residence, previous bad obstetrics history, maternal educational status, Ownership of information source like Radio/TV and monthly income (*Table 3*).

## Discussion

This study has attempted to assess magnitude and factors associated with institutional delivery service utilization among mothers who gave birth in the past 12 months. The study shows that 85.9% of mothers gave birth in health facilities. The major assistants for home delivery cases were families or relatives (39.2%) followed by traditional birth attendants (TBA) (36.7%).

The magnitude of institutional delivery in this study is higher than a study's finding in Tanzania which is 56%(13). It is also higher when compared with different findings in Ethiopia like in Debre Berhan in which 80.2%(22), Bahir Dar and Debre markos whose magnitudes were 78.8% and 80.14% respectively(12, 23). The difference might be due to time gap. Similarly, this proportion is higher compared to Ethiopian demographic health survey (EDHS) 2016 report on utilization of institutional delivery service among urban mothers which was 74%(14). It is also higher than a study conducted in Arbaminch (23%)(20), Boset,Oromia regional state (60%)(18), Awi(15.7%) and sekela (12.1%) (7, 21). This difference might be due to the fact that high proportions of urban mothers (91.1%) were included in our study.

But this study's finding is lower when compared to a study conducted in Gana which was (93.3%)(8). The difference might be due to difference in socio-demographic characteristics.

One of the predictor variables for institutional delivery utilization was *residence*. Mothers whose residence was urban were 3.2 times more likely to give birth in the health facilities when compared with the rural counterparts (AOR = 3.2, 95% CI: 1.6, 6.4). This finding is supported by a study conducted in Arbaminch, Debre Berhan, sekela Amhara regional state and Guragi. The possible explanation for this might be: Mothers in the urban are likely to have high access for the health centers than mothers from the rural side who might be absent due to transportation obstacles.

*Maternal educational status* was another positively associated variable. Mothers who can read/write were 3 times more likely to deliver in health institution than those mothers who can't read/write (AOR = 2.8, 95% CI: 1.3, 6.3), Who attended primary education were 4 times more likely to utilize institutional delivery service (AOR = 4.3, 95% CI: 2.1, 9.1), mothers who attended secondary and preparatory education were 8 times more likely to give birth in health facility as compared to that of who cannot read/write (AOR = 7.9, 95% CI: 3.4, 18) and utilization of institutional delivery service is 17 times higher in mothers who attended diploma and above educational level as compared to those who cannot read/write (AOR = 17.3 95% CI: 4.2, 71.2). The higher the educational level is, the more likely to use institutional delivery service will be. This might be due to the fact that educated mothers may be aware of the benefits of giving birth at health facility.

*Bad obstetrics history* was also a predictor variable for institutional delivery service utilization. Mothers who had bad obstetrics history were 2 times more likely to give birth in health institutions compared with the counterparts(AOR = 2.3, 95% CI: 1.23, 4.7). It is supported by the studies done in Guji zone and Dodota district of Oromia regional state. This might be due those who had bad obstetrics history might be more frightened to pregnancy related complications.

*Ownership of mass media like TV and radio* was another predictor variable. Mothers who had mass media 3 times more likely to deliver in health facilities than the counterparts (AOR = 3.3, 95% CI: 1.9, 5.9).

*Monthly income* also had its positive effect on institutional delivery. Mothers with average monthly income greater than 160.7 USA dollars were 2 times more likely to give birth in health facility than with

average monthly income of less than 53.6 USA dollars (AOR = 2.4, 95% CI: 1.1, 5.3). It might be due to the fact that they could afford the payable transportation.

*Limitations:* It was good if the sampling technique were triangulated with the qualitative sampling designs.

## Abbreviations

*TBA:* Traditional birth attendance, *EDHS:* Ethiopian demographic survey, *ANC:* Ante natal care, *AOR:* Adjusted odds ratio, *COR:* Crudes odds ratio

## Declarations

# Ethics approval and consent to participate

Letters of cooperation was written to administration of selected kebeles by ethical review committee of school of Midwifery, college of medicine and health science, University of Gondar. Permission and written consent was obtained from each respondents. Data were collected after informing the participants about the objectives of the study, the benefits and also the fact that the right to decide not to participate. All information obtained from the participants at any course of the study was kept confidential. The mothers were also informed that they had full right not to participate in or withdraw from the study.

## Consent for publication

Not applicable because there are no individually detailed data, videos or images.

## Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Competing interests

We authors declare that we have no competing interests.

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The article was not funded.

# Authors' contributions

*GLA* brought the idea. Then all, *GLA, BZD, ESA, MAB* and *WKM* equally contributed on proposal development, data collection process, data management and analysis, and write up. All authors have read and approved the manuscript.

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## Tables

**Table 1:** Socio-demographic characteristics of mothers who gave birth in the last 12 months in Gondar town, North West Ethiopia, 2019 (n= 566)

<b>Variables</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age of mother</b>	15-19	19	3.4
	20-24	90	16
	25-29	211	37.5
	30-34	134	23.8
	>=35	108	19.2
<b>Religion</b>	Orthodox	469	83.5
	Protestant	35	6.2
	Muslim	57	16.1
	Catholic	1	.2
<b>Residence</b>	Urban	512	91.1
	Rural	50	8.9
<b>Ethnicity</b>	Amara	519	92.3
	Kimant	30	53.4
	Tigre	13	2.3
<b>Marital status</b>	Single	7	1.2
	Married	518	92.2
	Widowed	15	2.7
	Divorced	22	3.9
<b>Educational status</b>	Can` t read and write	93	16.5
	Read and write	58	10.3
	Primary education	100	17.8
	Secondary education	145	25.8
	Diploma and above	166	29.5
<b>Educational status of husband</b>	Can` t read and write	40	7.1
	Read and write	76	13.5
	Primary education	73	13
	Secondary education	115	20.5
	Diploma and above	213	37.9
<b>Occupation of mother</b>	Housewife	243	43.2
	Governmental employ	172	30.6
	Farmer	25	4.4
	Merchant	57	10.1
	Private employ	46	8.2
	<b>Others*</b>	19	3.4
<b>Occupation of husband</b>	Governmental employ	194	34.5

	Farmer	40	7.1
	Private employ	116	20.6
	Merchant	131	23.3
	Daily laborer	20	3.6
	<b>Others*</b>	17	3
<b>Family size</b>	<=3	197	35.1
	4-6	325	57.8
	>=7	40	7.8
<b>Monthly income</b>	<53.6 USA dollar	83	14.8
	53.6-107 USA dollar	147	26.2
	107.2 -160.7 USA dollar	108	19.2
	>160.7 USA dollar	224	39.9
<b>Availability of TV/radio</b>	Yes	470	83.6
	No	92	16.4
<b>Time takes to reach HF</b>	<30 min	240	42.7
	30-60min	276	49.1
	>60 min	46	8.2

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**Others\***= Students, no category

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**Table 2:** Obstetrics characteristics of mothers who gave birth in the last 12 months in Gondar town, North West Ethiopia, 2019 (n= 566)

<b>variables</b>	<b>category</b>	<b>Frequency</b>	<b>Percent</b>
<b>age at 1<sup>st</sup> marriage</b>	<=15	35	6.5
	16-20	227	40.7
	21-25	243	43.5
	>=26	52	9.3
<b>age at 1<sup>st</sup> pregnancy</b>	<=15	6	1.1
	16-20	173	30.8
	21-25	294	52.3
	>=26	89	15.8
<b>gravidity</b>	1	183	32.6
	2-4	326	58
	>=5	53	9.4
<b>parity</b>	1	200	35.6
	2-4	320	56.9
	>=5	42	7.5
<b>experience of bad obstetrics history</b>	Yes	136	24.2
	No	426	75.8

<b>ANC visit</b>	Yes	502	89.3
	No	60	10.7
<b>No of ANC visit</b>	1 times	22	4.3
	2 times	39	7.7
	3 times	110	22.0
	4 times	261	60.0
	>4 times	70	14.0
<b>IFA at 1<sup>st</sup> visit</b>	1 <sup>st</sup> tm	222	44.2
	2 <sup>nd</sup> tm	244	48.6
	3 <sup>rd</sup> tm	36	7.2
<b>Advice during ANC about place of delivery</b>	Yes	479	95.4
	No	23	4.6
<b>Place of delivery</b>	Home	79	14.1
	Health facility	483	85.9
<b>Reasons for institutional delivery</b>	High quality service	264	54.8
	Advice during ANC	174	36.1
	Previous bad obstetrics history	50	10.3
	Fear of complication	225	46.7
	Previous better outcome	40	8.3

		Others	2	0.4
home reason	delivery preference	Culture recommended	36	45.5
		Previous better outcome	48	60.7
		Lack of transport	16	20.2
		More trust on TBA	4	5.1
		Poor quality service in health facility	1	1.2
		Husband/family don` t allow	2	2.5
		Need of privacy	4	5.1
		<b>Others*</b>	2	2.5
<b>Other* = short period of time</b>				
home delivery, who assisted		TBA	29	36.7
		No one	19	24.1
		Family/relatives	31	39.2

**Table 3:** Bivariate & Multivariate logistic regression results of factors associated with institutional delivery service utilization among women who gave birth in the last 12 months in Gondar town, North West Ethiopia, 2019 (n= 566).

**Place of delivery**

as	HI (%)	Home	COR(95%CI)	AOR(95%CI)
ce				
	449(87.8)	63(12.3)	3.3(1.7-6.4)	<b>3.2(1.6-6.4)</b>
y	34(68.0)	16(32.0)	1.00	-
<b>onal status of</b>				
to read and write	54(58.1)	39(41.9)	1.00	-
read/write	46(79.3)	12(20.7)	2.7(1.3-5.9)	<b>2.8(1.3-6.3)</b>
education	86(86.0)	14(14.0)	4.4(2.2-8.9)	<b>4.3(2.1-9.1)</b>
ary & preparatory on	135(93.1)	10(6.9)	9.7(4.5-20.9)	<b>7.9(3.4-18.0)</b>
and above	162(97.6)	4(2.4)	29.2(9.9- 85.6)	<b>17.3(4.2- 71.2)</b>
SA dollars	56(67.5)	27(32.5)	1.00	-
7 USA dollars	121(82.3)	26(17.7)	2.2(1.2-4.2)	1.6(0.8-3.3)
60.7 dollars	97(90.7)	10(9.3)	4.7(2.1-10.4)	<b>2.5(1.03- 6.06)</b>
USA dollars	208(92.9)	16(7.1)	6.3(3.2-12.4)	<b>2.4(1.1-5.3)</b>
<b>of communication</b>				
	422(89.8)	48(10.2)	4.5(2.6-7.5)	<b>3.3(1.9-5.9)</b>
	61(66.3)	31(33.7)	1.00	-
<b>kes to reach health</b>				
in 30 min	221(92.1%)	19(7.9%)	11.6(5.5- 24.5)	0.2(0.00-1.2)
in	239(86.6%)	37(13.4%)	6.5(3.3-12.6)	0.2(0.00- 1.03)
than 60 min	23(50%)	23(50%)	1.00	-
<b>st marriage</b>				
	26(72.2%)	10(27.8%)	1.00	-
	179(78.9%)	48(21.1%)	1.4(0.6-3.2)	0.1(0.001-

	226(93%)	17(7%)	5.1(2.1-12.3)	10.4) 0.8(0.001-12.5)
	49(94.2%)	3(5.8%)	6.3(1.6-24.8)	0.2(0.00-22.3)
<b>s bad obstetrics</b>				
	124(91.2)	12(8.8)	1.9(1.1-3.7)	<b>2.3(1.2-4.7)</b>
	359(84.3)	67(15.7)	1.00	-
<b>st ANC visit</b>				
ester	212(95.5%)	10(4.5%)	8.1(3.1-21.4)	3.13(0.2-54.8)
ester	232(95.1%)	12(4.9%)	7.4(2.9-18.9)	4.2(0.3-53.8)
ester	26(72.2%)	10(27.3%)	1.00	-

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