

# Client Retention in the Continuum of Maternal Health Services and Associated Factors in Ethiopia

Frehiwot Birhanu<sup>1\*</sup> Kiddus Yitbarek<sup>2</sup> Mirkuzie woldie<sup>3</sup>

<sup>1</sup>School of Public Health, College of Health Science, Mizan-Tepi University, South-west Ethiopia, <sup>2</sup>Department of Health Policy and Management, Faculty of Public Health, Jimma University, Ethiopia. <sup>3</sup>Fenot Project, School of Population and Public Health, University of British Columbia, Addis Ababa, Ethiopia.  
Correspondence @frehiwotb2017@gmail.com

## Abstract

**Introduction:** Even though global maternal mortality has shown an impressive decline over the last three decades, the problem is still pressing in low-income countries. To bring this to an end the women in a continuum of maternity care should be retained. This study aimed to assess the status of Ethiopian women's completion of care with their possible predictors.

**Methods:** We used data from the 2019 Ethiopian mini-Demographic and Health Survey. The outcome variable in this study was retention in the continuum of maternity care, which consists of at least four ANC contacts; delivery in a health facility; and postnatal check within 48 hours of delivery. We analyzed the data using STATA version 14, and a binary logistic regression model was used. A p-value  $\leq 0.05$  was considered to declare an association with the outcome variable. A weighted analysis was also done.

**Results:** Of the 3917 women included in this study, only 20.8% of women completed all of the recommended services. The overall completion of care was associated with women's level of education, wealth status, timeliness of ANC, and birth order.

**Conclusions:** Despite the efforts by the Ethiopian government and other stakeholders, the overall completion of care was quite low. There is also a clear inequality in terms of remaining in the continuum of maternity care because of women's background characteristics and regional variation.

**Keywords:** Continuum of care, EDHS, Ethiopia, Maternity care

## Introduction

Even though the global Maternal Mortality Ratio (MMR) and neonatal mortality over the last two to three decades have shown an annual 2.9% and 2.5% decline respectively,<sup>1,2</sup> the problem is still pressing in Low and Middle-Income Countries (LMIC). To end this, the World Health Organization (WHO) launched a strategy to End Preventable Maternal Mortality (EPMM) through a maternal health service continuum across the stages of pregnancy, delivery, and postpartum periods in 2015.<sup>3</sup>

In Ethiopia, as part of the strategies, the government identified maternal, newborn, and child health as a priority agenda aiming to reduce the MMR from 412 in 2017 to 70 per 100,000 live births by the end of 2030.<sup>4</sup> Although studies are showing that status of completion of maternity services in Ethiopia, the findings present inconsistent figures ranging from 14% to 47%<sup>5</sup> and predictors are not studied at each stage yet.

## Objective

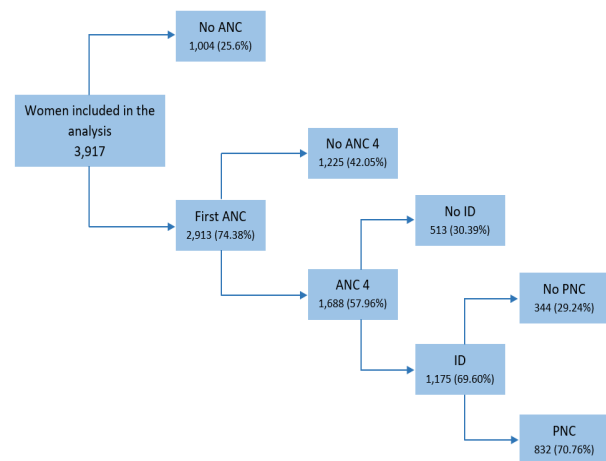
In this paper, we examined the degree of retaining clients within the continuum of maternity care with possible predictors in Ethiopia using recent nationally representative data.

## Method

The 2019 mini demographic and health survey (DHS) data was used. All women aged 15-49 years were eligible for this study. The outcome variable in this study was the continuum of maternal health care. It involves attending at least four ANC contacts, delivery in a health facility, and post-natal check within 48 hours of delivery. We used a binary logistic regression model in two steps to identify predictors of completion of maternity care. A p-value  $\leq 0.05$  was considered to declare association. The data were analyzed using STATA version 14. Weighted analysis was also done.

## Result

Of the 3,917 women included in the analysis, three-fourths of 2,913 (74.38%) of them had their first ANC contact. More than half (57.6%) of those who had the first ANC contact made it to the fourth or more ANC contacts. About 70% of women who had four or more ANC contacts gave birth in a health facility. Furthermore, more than 70% of mothers who delivered in a health facility had PNC within 48 hours of their delivery. Overall, 20.8% of pregnant women who were included in this study completed the continuum of care for their latest child. (Figure 1)



ANC=Antenatal care, ID= Institutional delivery, PNC= post-natal care

**Figure 1: Decision tree depicting the degree of retention and dropout along the continuum of maternity care in Ethiopia, 2019 mini-Ethiopian Demographic Health Survey.**

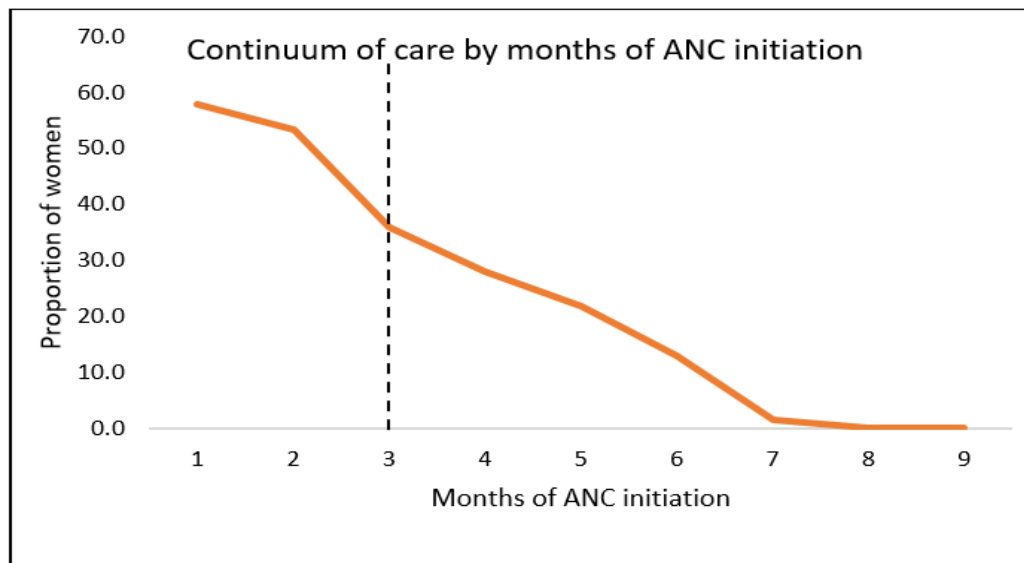
Completion of the maternal health service has shown to be higher in the capital city of Ethiopia, Addis Ababa, followed by the Tigray region and Dire Dawa city administration. (Table 1)



**Table 1: the level of completion of maternal health services across the nine regions, and two city administrations, EMDHS, 2019, Ethiopia.**

Region	>= 1 ANC (n = 3,917)	ANC 1 & 4 (n = 2,913)	ANC 1,4 & ID (n = 1,688)	ANC 1,4, ID & PNC (n = 1,175)	Continuum (n = 3,917)
Tigray	270[94.7]	183[67.8]	152[82.9]	129[84.9]	129[45.2]
Afar	32[62.8]	16[49.7]	10[61.6]	6[64.6]	6[12.4]
Amhara	711[84.9]	426[59.9]	298[69.9]	207[69.4]	207[24.7]
Oromia	1076[70.8]	617[57.4]	379[61.5]	233[61.4]	233[15.3]
Somali	63[29.2]	24[38.5]	14[58.7]	6[43.7]	6[2.9]
Benishangul	39[83.2]	26[67.5]	16[59.5]	11[73.2]	11[24.5]
SNNPR	558[71]	269[48.2]	185[69]	128[69.1]	128[16.3]
Gambella	16[86.3]	6[36.9]	5[83.2]	4[70.5]	4[18.7]
Harari	9[80.6]	4[48.6]	4[89.9]	3[71]	3[25]
Addis Ababa	121[96.8]	104[85.4]	101[97.7]	80[79.4]	80[64.1]
Dire Dawa	18[84.3]	13[73.7]	11[85.5]	7[63.1]	7[33.5]
Total	2913[74.4]	1688[74.4]	1175[69.6]	814[69.3]	814[20.8]

As found in this study, for women who started their first ANC in the early 8 weeks, the chance of completion of the continuum was highest, and the chance of completion starts to go down as the weeks of first contact increased. (Figure 2)



**Figure 2: Time of ANC initiation versus completion of the continuum of maternity care among women aged 15-49 years, 2019 mini-Ethiopian Demographic Health Survey, Ethiopia.**

Finally, women's level of education, the wealth status of the women, and early initiation of the first ANC explained the overall completion of care. (Table 2)

**Table 2: Predictors of completing the continuum of maternity care among women aged 15-49 years, EDHS, 2019, Ethiopia.**

Variables	Category	ANC≥4 (n = 3,962)	ANC≥4 + ID (n = 1,656)	ANC≥4 + ID + PNC (n = 1,202)	Continuum (n = 3,962)
		AOR[95%CI]	AOR[95%CI]	AOR[95%CI]	AOR[95%CI]
Age group	15-19	1		1	1
	20-24	1.19[0.59,2.39]		2.07[0.69,6.19]	1.69[0.79,3.61]
	25-29	1.55[0.73,3.29]		1.02[0.37,2.81]	1.4[0.69,2.83]
	30-34	1.88[0.87,4.05]		1.54[0.54,4.35]	1.87[0.81,4.33]
	35-39	1.77[0.77,4.09]		1.28[0.42,3.92]	2.33[0.92,5.92]
	40-44	2.11[0.84,5.29]		2.23[0.54,9.29]	2.54[0.94,6.86]
	45-49	2.75[0.84,8.97]		3.73[0.32,42.76]	5.03[1.01,23.31]
Level of education	No education	1	1	1	1
	Primary	1.28[0.96,1.72]	1.05[0.68,1.64]	1.04[0.65,1.66]	1.25[0.9,1.75]
	Secondary	2.54[1.42,4.54]*	1.43[0.71,2.89]	1.39[0.65,2.97]	2.27[1.43,3.61]*
	Higher	1.85[0.92,3.7]	1.42[0.3,6.63]	1.94[0.8,4.7]	2.12[1.08,4.25]*
Birth order	1	1	1		1
	2	0.78[0.49,1.24]	0.75[0.39,1.43]		0.8[0.55,1.14]
	3	0.88[0.49,1.57]	0.32[0.18,0.6]		0.58[0.35,0.97]*
	4 or more	0.89[0.5,1.59]	0.4[0.23,0.71]		0.64[0.35,1.18]
Place of residence	Urban	1	1	1	1
	Rural	1.05[0.76,1.46]	0.85[0.44,1.64]	0.96[0.51,1.83]	0.96[0.59,1.54]
Wealth quintile	Poorest	1	1	1	1
	Poorer	1.6[1.04,2.44]	2.31[1.29,4.13]*	1[0.37,2.7]	2.22[1.31,3.75]*
	Middle	1.22[0.76,1.95]	2.34[1.18,4.65]*	1.23[0.39,3.88]	1.98[1.06,3.7]*
	Richer	1.6[1.11,2.32]*	4.57[2.25,9.26]*	1.59[0.56,4.52]	3.5[1.93,6.33]*
	Richest	2.59[1.45,4.62]*	8.64[4.07,18.36]*	1.53[0.53,4.4]	5.16[2.65,10.07]*
ANC1 at 1 <sup>st</sup> trimester	No	1	1	1	1
	Yes	3.29[2.55,4.24]*	1.03[0.71,1.47]	1.2[0.76,1.89]	2.17[1.66,2.85]*
Marital status	Currently not in union	1		1	
	Currently in union	1.95[1.16,3.29]*		0.66[0.2,2.18]	
Head of the household	Male		1		
	Female		1.36[0.72,2.57]		
History of child death	No	1	1		1
	Yes	1.08[0.76,1.52]	1[0.63,1.59]		1.07[0.66,1.72]
Birth by CS	No			1	1
	Yes			2.74[1.24,6.07]*	2.48[1.41,4.36]*
Constant		0.17[0.08,0.35]	1.25[0.54,2.89]	1.35[0.2,9.11]	0.06[0.02,0.12]



**Conclusion and recommendation** Despite the efforts by the Ethiopian government and other stakeholders, the overall completion of the maternity care continuum is quite low. There is also a huge regional variation, where the completion of care is higher in the two city administrations, Addis Ababa, Dire Dawa, and Tigray region. We have also found a clear inequality of service use because of women's background characteristics like level of education and wealth status. To retain women in the continuum, approaches should aim to empower women through improved educational experience and economic standing by working with other relevant sectors.

## References

1. Organization WH. Newborns: improving survival and well-being. Published 2020. [https://www.who.int/news-room/fact-sheets/detail/newborns-reducing-mortality?\\_\\_cf\\_chl\\_managed\\_tk\\_\\_=JuorEwJkfqq8cGycGB6ebOK4V7PG7qzsjGTNC021bYk-1643372917-0-gaNycGzNCaU](https://www.who.int/news-room/fact-sheets/detail/newborns-reducing-mortality?__cf_chl_managed_tk__=JuorEwJkfqq8cGycGB6ebOK4V7PG7qzsjGTNC021bYk-1643372917-0-gaNycGzNCaU)
2. Alkema L, New JR. Global estimation of child mortality using a Bayesian B-spline bias-reduction model. *Ann Appl Stat.* 2014;8(4):2122-2149. doi:10.1214/14-AOAS768
3. Document U, Comment USE, To F, Epmm T. Strategies toward ending preventable maternal mortality ( EPMM ). 2015;6736(2013):1-4.
4. Ayele AA, Getaye Tefera Y, East L. Ethiopia's commitment towards achieving sustainable development goal on reduction of maternal mortality: There is a long way to go. *Women's Heal.* 2021;17:0-3. doi:10.1177/17455065211067073
5. Dadi TL, Medhin G, Kasaye HK, et al. Continuum of maternity care among rural women in Ethiopia: does place and frequency of antenatal care visit matter? *Reprod Health.* 2021;18(1). doi:10.1186/s12978-021-01265-x