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# Wealth disparities in maternal health service utilization among women of reproductive age in Ethiopia: findings from the mini-EDHS 2019

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## Abstract

**Background** Ethiopia has made strides in reducing maternal mortality, but significant discrepancies in maternal health service utilization exist across socioeconomic levels. According to studies, women from higher-income households are far more likely to use essential services such as antenatal care, delivery care, and postnatal care than poorer women. This wealth disparity is a primary contributor to persistently high maternal mortality, particularly among poor populations. The study's goal was to assess wealth disparities in maternal health service uptake and identify contributing factors.

**Methods and materials** We used the Ethiopian Mini Demographic Health Survey (EMDHS), conducted in 2019 on women aged 15–49 living in selected census areas, with a weighted sample size of 3,909. The Erreygers Concentration Index (ECI) was used to measure wealth inequalities in maternal health care, and the ECI decomposition was used to identify factors contributing to inequality in maternal health services.

**Results** Maternal health service utilization was pro-rich among women in Ethiopia. The prevalence of antenatal care service (ANC), delivery, and postnatal care (PNC) service utilization showed a pro-rich distribution among Ethiopian women, with ECI = 0.115 (95% CI: 0.091–0.137), ECI = 0.223 (95% CI: 0.191–0.276), and ECI = 0.121 (95% CI: 0.041–0.200), respectively. The ECI indices were decomposed to examine the contributing factors to disparities in maternal service utilization in Ethiopia. Mother's current age, household family size, region, birth order, and parity were contributors to maternal health service utilization.

**Conclusion** The ANC service, delivery service and PNC service utilization showed a pro-rich distribution among Ethiopian women. Mother's current age, household family size, region, birth order, and parity are important contributors of maternal health service inequality. To improve access and usage among low-income women, policymakers can develop programs including increasing the number of free or subsidized services and providing transportation.

**Keywords** Maternal health service utilization, Wealth status, Antenatal care service, Delivery service, Postnatal care service, Ethiopia

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## Introduction

The World Health Organization (WHO) defines maternal health service utilization as the use of healthcare services by women during pregnancy, childbirth and the postpartum period, which includes antenatal care, skilled birth attendance, and postnatal care [1]. The focus of maternal health services utilization is on access to and quality of services to reduce maternal morbidity and mortality [2].

Antenatal care is the regular health check-ups during pregnancy to monitor maternal and fetal health. Whereas, delivery service utilization is the use of healthcare services during childbirth, including access to skilled birth attendants, required medical interventions, and appropriate facilities [3]. Postnatal care includes health care services provided after childbirth to monitor maternal and fetal health [4].

Globally, there is a disparity in the uptake of maternal healthcare services across different regions [5]. Several studies conducted in Bangladesh, Pakistan, India, and Lao have revealed inequalities in maternal healthcare, including skilled birth attendance, ANC visits, and PNC service. These disparities are based on socioeconomic factors such as wealth status, husband's education, maternal education, and place of residence [6–9].

Additionally, in India maternal health service utilization disparity is common between poor and non-poor populations [10]. Similarly, studies conducted in different African countries have revealed disparities in the utilization of maternal healthcare services [11–15]. Furthermore, a study conducted in 36 SSA countries found socioeconomic disparities in ANC services [16, 17]. In addition, the coverage of four or more ANC services was found to favor the wealthier population within and across nine African countries [18]. Another evidences focusing on SSA, including Kenya and Zimbabwe, revealed that skilled birth attendance and ANC services tend to be more accessible to individuals with higher socioeconomic status [19–24].

According to the Ethiopian demographic health survey (EDHS), over the last 16 years, at least one ANC visit has increased (27–62%) [25, 26]. Institutional delivery care increased from 11.7 to 35.9% between 2011 and 2016 [26, 27]. But, PNC service has been low over the last 20 years (5.6–18.5%) [28–30].

Furthermore, studies conducted in different regions of Ethiopia have indicated that ANC services, PNC services, and skilled birth attendance tend to be more accessible to individuals of higher socioeconomic status [31–37]. However, another study revealed that the attendance of the first ANC visit was observed to be slightly more common among poor women. and there is no inequalities between poor and rich on the utilization of at least four ANC visits [38].

Various factors have been found to influence the utilization of maternal health services. For instance, socioeconomic status influences antenatal care and postnatal care utilization [39, 40]. Besides, studies in African countries revealed socio-economic inequality and socio-cultural barriers were found to have an impact on the utilization of maternal healthcare services [41–45]. as additionally, wealth, husband's education, women's education, distance to healthcare facilities, and residence status were identified as important positive contributors to the utilization of skilled birth attendance, ANC, and PNC care services [46–50]. Furthermore, antenatal care had the strongest effects on both institutional delivery and postnatal care service utilization [51].

Even though several studies have been conducted on maternal health service (ANC, delivery care, and PNC) disparities [47, 49–52], no study has yet decomposed wealth status inequality using EMDHS to assess what is driving maternal health service utilization in Ethiopia. Identifying the causes of maternal health service inequality is critical for policymakers concerned with mother health. This study used EMDHS to analyze several determinants of maternal health service utilization in Ethiopia, analyzing wealth status inequalities.

## Methods and materials

### Data source and source population

The 2019 EMDHS dataset was used in this analysis. It was the fifth EMDHS that was carried out in Ethiopia between March 21 and June 28, 2019. The Federal Ministry of Health (FMoH), the Ethiopian Public Health Institute, and the Central Statistical Agency worked together to conduct the EMDHS.

There were two steps in the survey's sampling procedure. Initially, a probability proportional to each enumeration area's size was used to separately select a total of 305 enumeration areas (93 urban and 212 rural). From the newly formed household listing, 30 households/clusters were then methodically selected, with each cluster having an equal chance of being chosen. Detailed information on the sampling procedures can be found in the 2019 EMDHS report accessible on the measure DHS website (<https://www.dhsprogram.com/>). After requesting and receiving consent from the DHS, the individual record (IR) dataset was utilized to collect the data used in this analysis from the DHS website.

The study's target population consisted of women living in the designated enumeration regions between the ages of 15 and 49. The EMDHS interviewed 8,855 women of reproductive age (15–49) from a nationally representative sample of 8,663 households and the response rate was 99.55% (8,815) and the weighted sample size was 8,827. Among interviewed women 3,979 women had data for ANC service, 3,979 for delivery service and 3,978 for

PNC service. Then variables were weighted and the final sample sizes were 3,909 for ANC services, 3,909 for delivery services, and 3,908 for PNC services.

**Operational definition of variables**

The use of ANC was defined as at least one visit to a doctor, nurse, or midwife for the supervision of the last pregnancy that has resulted in a live birth, as stated by the respondent [49, 50, 53, 54]. Delivery care service (dichotomous as home and institutional) was coded by institutional delivery when mothers received delivery care from skilled birth attendants [52]. Women and newborns have at least one check-up by a skilled health professional within 42 days after birth at the health facility [30].

According to UNDP Ethiopia fast facts developing regional states report Ethiopian regions relatively classified to developed regions (Tigray, Amhara, Oromia, Harari, SNN, Addis Ababa and Dire-Dawa) and developing regions (Afar, Benishangul-Gumuz, Gambela and Somali) [55].

**Data management and analysis**

Data analysis was performed using the statistical software STATA for windows Version 17.0. The results were determined based on the standard error, p-value, and a 95% confidence interval.

**Concentration curve and index analysis**

The extent of wealth inequality in the utilization of maternal health service utilization (ANC service, delivery service and PNC service) was assessed by concentration curves (CC) and Erreygers concentration index (ECI) [56, 57]. The CC illustrates the distribution of ANC service, delivery service and PNC Service across wealth index levels, ranging from the poorest to the richest, among the surveyed women. On the X-axis of the curve, the women surveyed are ordered based on their wealth status, while the Y-axis represents the cumulative proportion of women uptake ANC service, delivery care service and PNC service. If health were equally distributed across the population according to their income, a 45° diagonal line would be observed, resulting in an ECI of zero. Any deviation of the curve from this diagonal line indicates the presence of inequality. The separation of the curve from the diagonal generates an area under the curve (AUC), which corresponds to the value of the ECI.

A positive ECI value (curve below the diagonal) suggests that the inequality in up taking health services is more concentrated among wealthier groups, while a negative ECI value (curve above the diagonal) indicates that the inequality is greater among poorer groups [58]. ECI values close to zero indicate no inequality, whereas ECI values closer to +1 or -1 indicate greater inequality [58]. The magnitude of inequality is reflected by the

AUC, represented by the ECI, with a larger AUC indicating greater inequality [59].

The ECI can be computed making use of the covariance.

$$ECI = \frac{2}{\hat{\gamma}} COV(\gamma_i, R_i)$$

[46]Where:  $\gamma_i$  is the health variable

$\hat{\gamma}$  is the mean of  $\gamma_i$

$R_i$  is the fractional rank of the  $i$ th individual.

COV indicates covariance.

**Decomposition of erreygers concentration index**

The ECI measures the degree of wealth-related inequality in health variables [8]. The decomposability of the Erreygers normalized concentration index allows for the computation of contributions from factors influencing maternal health services (ANC service, delivery service and PNC services). ANC service, delivery service and PNC service disparities are decomposed into the contributions of different explanatory factors, where each contribution is calculated as the product of health elasticity. It considers the distribution of wealth and its impact on predictors. Negative absolute contributions indicate pro-poor inequality, while positive values suggest pro-rich inequality.

Product of health elasticity refers to the responsiveness of maternal health service utilization to change in a specific factor. Absolute contribution quantitatively provides the specific amount of inequality each factor contributes. Whereas percentage contribution expressed as a percentage of the total which provides the relative importance of each factors in contributing overall inequality [46, 60].

The CI of the respective utilization variable is decomposed to estimate the contributions of each covariate to inequalities in the utilization outcome [60] A linear expression for the individual utilization outcome ( $y_i$ ) denoted as:

$$\gamma_i = \alpha + \sum_k \beta_k \omega_k + \mu_i$$

Where;  $\omega_k$  represents the combination of explanatory factors  $k = (1 \dots k)$  and the concentration index for the utilization  $y_i$  is expressed as follows;

$$CI(\gamma_i) = \sum_k (\beta_k \bar{\omega}_k / \mu) C_k + GC / \mu$$

This equation is divided into two parts. The first component of ( $y_i$ ) is equal to the summed weights of the product for the elasticity of  $y_i$  with respect to each  $k$  specified as  $(\beta_k \bar{\omega}_k / \mu)$  and the CI of each  $k$  repressor  $C_k$ . The second

**Table 1** Socio-demographic, socio-economic and obstetric characteristics of women (15-59) in 2019 mini EDHS

Variables	Categories	Weighted frequency	Weighted percentage
Mothers' age at birth	15-20	2,723	30.85
	20-34	3,748	42.46
	35-49	2,356	26.69
Household head sex	Male	6,998	79.28
	Female	1,829	20.72
Residence	Urban	2,843	32.21
	Rural	5,984	67.69
Women's educational	No education	3,554	40.26
	Primary	3,680	41.69
	Secondary	1,086	12.31
	Higher	507	5.74
Husband's education	Primary	3,680	69.79
	Secondary	1,086	20.60
	Technical/vocational	249	4.72
	Higher	258	4.88
Religion	Orthodox	3,657	41.43
	Catholic	47	0.53
	Protestant	2,424	27.46
	Muslim	2,601	29.47
	Traditional	82	0.93
	Others	16	0.18
Marital status	Not having partner	3,017	34.18
	Having partner	5,810	65.82
Household family size	1-3	1,761	19.96
	4-7	5,273	59.74
	>=8	1,793	20.31
Number of under 5 children	=<1	101	1.15
	2-3	1,660	18.81
	>=4	7,065	80.04
Household wealth status	Poorest	1,424	16.13
	Poorer	1,606	18.19
	Middle	1,664	18.85
	Richer	1,864	21.11
	Richest	2,269	25.71
Region*	Developing regions	638	7.23
	Developed regions	8,189	92.77
Birth order	1	1,034	17.84
	2-4	2,471	42.63
	>=5	2,292	39.53
Parity	=<2	5,074	57.48
	3-5	2,070	23.45
	>=6	1,683	19.07
ANC service	No	1,024	26.20
	Yes	2,885	73.80
Delivery service	Home	1,789	45.77
	Health institution	2,120	54.23
PNC care service	No	3,383	86.57
	Yes	525	13.43

**Region\*** developed regions (Tigray, Amhara, Oromia, Harari, SNN, Addis Ababa and Dire-Dawa) and developing regions (Afar, Benishangul-Gumuz, Gambela and Somali)

part of the equation, the residual, reflects inequality in the utilization of maternal health service. It captures inequality that is not accounted for by the explanatory variables.  $GC_e$  is the concentration index for the residual  $ui$ .  $\mu$  is the mean of  $yi$ ,  $\bar{\omega}k$  is the mean of  $\omega k$ , and  $C_k$  is the concentration index of  $\omega k$ .

Decomposition of the CI is performed using a two-part model to identify the factors associated with inequality. The explained component reflects the proportion of inequalities in the maternal health service utilization that is explained by the systematic variable in the selected factors. The residual component reflects that part of inequalities could not be explained by the selected factors across wealth quintiles.

Factors used for this analysis are educational status, religion maternal age, media exposure, occupation for ANC service [26, 61] and mother's age, education, media exposure, ANC visit, residency, family size, region, birth order, parity and residency have been widely reported as the key determinants of inequalities in uptake of delivery services [3, 27]. Besides determinants of PNC service are ANC visits, delivery place, residency [28-30]. Then, this study used the listed variables as predictors of decomposition analysis.

## Results

### Socio-demographic, socio-economic and obstetric characteristics of women [15-49]

The household wealth status reveals a varied distribution, with 25.71% falling in the richest category and 16.13% in the poorest. Access to ANC services is notable, with 73.80% of respondents utilizing these services. Regarding delivery services, 54.23% gave birth at health institutions, while 45.77% delivered at home. PNC care services are lacking for the majority, as 86.57% report not receiving postnatal care, contrasting with the 13.43% who did avail themselves of such services (Table 1).

### Maternal health service utilization (ANC service, delivery service and PNC service) by wealth quintile

Out of the quintile with the lowest income, 581 people (50.17%) received ANC service, whereas 577 people women (49.83%) did not. Among the participants women in the lowest quintile, 280 individuals women (24.18%) received home delivery services, while 878 people women (75.82%) received care at health institutions. Within the lowest quintile, 1,065 participants women (91.97% of the lowest quintile) did not obtain PNC service, whereas 93 people (8.03%) did. Out of the quintile with the highest income, 898 women (93.64%) received ANC service, whereas 61 women (6.36%) did not. Within the highest quintile, 865 (90.20%) gave birth at health institutions, whereas 94 (9.80%) women delivered at home (Table 2).

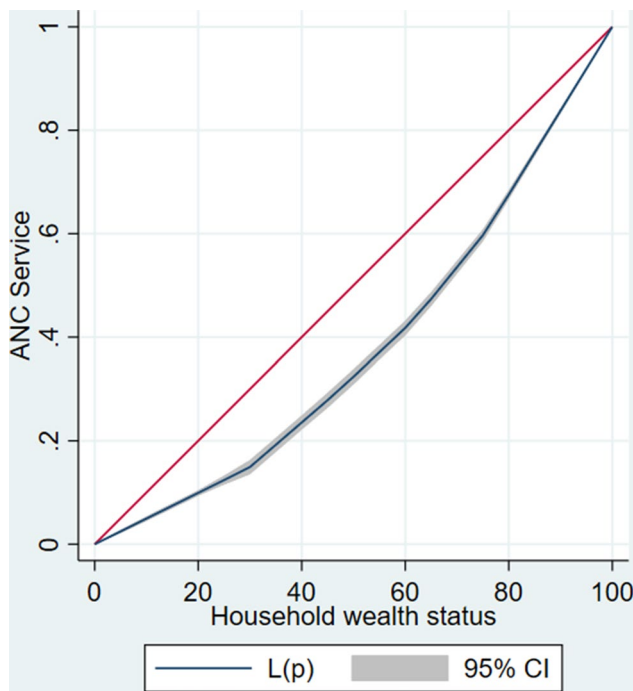
**Table 2** Descriptive statistics by ANC service, delivery service and PNC service quintile in percent

Variables	Category	Household wealth status					Total
		Poorest quintile	Poorer quintile	Middle quintile	Richer quintile	Richest quintile	
ANC service	No	577 (49.83)	176 (26.00)	128 (22.11)	82 (15.30)	61 (6.36)	1,024 (25.66)
	Yes	581 (50.17)	501 (74.00)	451 (77.89)	454 (84.70)	898 (93.64)	2,885 (73.80)
	Total	1,158	677	579	536	959	3,909
Delivery care service	Home	878 (75.82)	360 (53.18)	284 (49.05)	173 (32.28)	94 (9.80)	1,789 (45.77)
	Health institution	280 (24.18)	317 (46.82)	295 (50.95)	363 (67.72)	865 (90.20)	2,120 (54.23)
	Total	1,158	677	579	536	959	3,909
PNC service	No	1,065 (91.97)	584 (86.26)	486 (83.94)	459 (85.63)	789 (82.36)	3,383 (86.57)
	Yes	93 (8.03)	93 (13.74)	93 (16.06)	77 (14.37)	169 (17.64)	525 (13.43)
	total	1,158	677	579	536	958	3,908

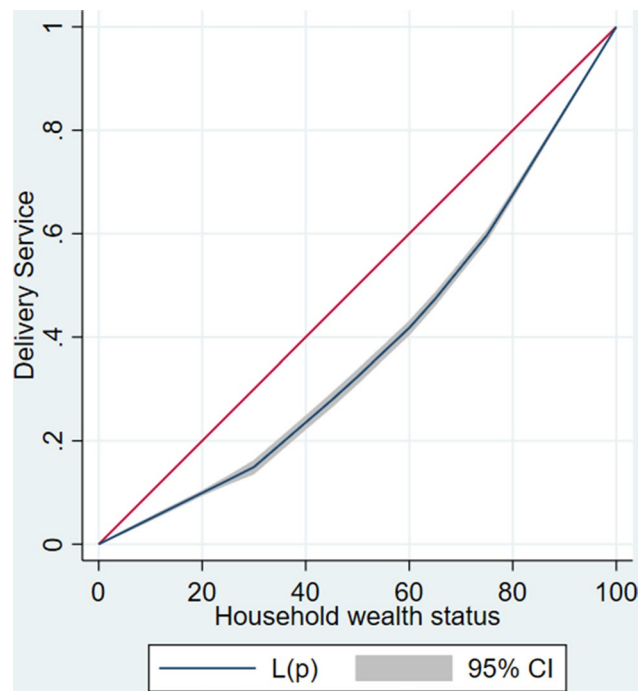
**Table 3** Inequality in maternal healthcare service (ANC, Delivery and PNC Services) by household wealth status

Maternal healthcare service	No. of observation	Concentration index (ECI)	Std. Err	95% CI	p-value
ANC Service	3909	0.115	0.011	0.091–0.137	0.0000
Deliver Service	3909	0.223	0.021	0.191–0.276	0.0000
PNC Service	3908	0.121	0.040	0.041–0.200	0.0032

Note Std. Err=standard errors CI=Confidence interval



**Fig. 1** Lorenz curve for ANC service utilization by household wealth status among women in the reproductive age group



**Fig. 2** Lorenz curve for delivery service utilization by household wealth status among women in the reproductive age group

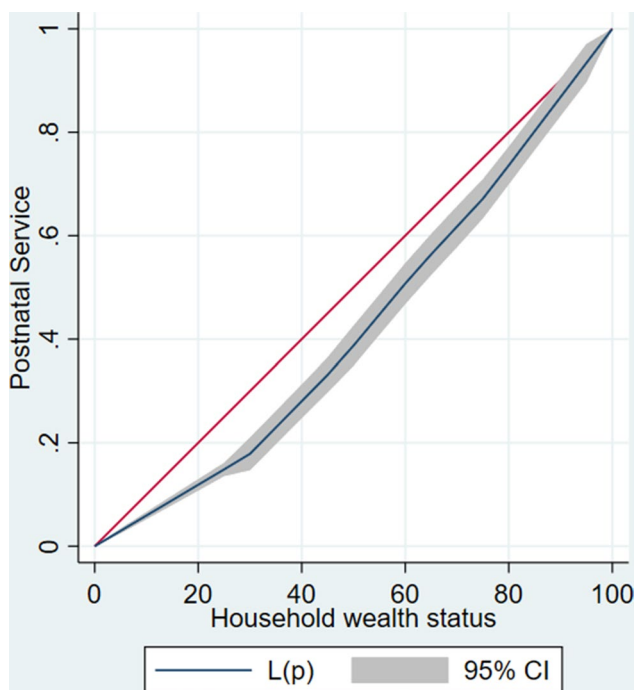
**Wealth status inequalities of maternal health service utilization**

The prevalence of ANC service, delivery care service, and PNC service utilization showed a pro-rich distribution among Ethiopian women, with ECI=0.115 (95% CI: 0.091–0.137), ECI=0.223 (95% CI: 0.191–0.276), and ECI=0.121 (95% CI: 0.041–0.200), respectively (Table 3). Moreover, the concentration curve indicated that the distribution of maternal healthcare service utilization was concentrated in rich households (Figs. 1, 2 and 3).

**Decomposition analysis result of erreygers concentration index**

The decomposition analyses provide information on the explained and unexplained components of the estimated concentration index value for the ANC service, delivery care service, and PNC service in Ethiopia.

The ECI indices were decomposed to analyze how the factors contribute to the disparities in the utilization of maternal services in Ethiopia. Household family size (contribution: 2.12, ECI: -0.166), region (contribution:



**Fig. 3** Lorenz curve for PNC care service utilization by household wealth status among women in the reproductive age group

20.51, ECI: 0.029), birth order (contribution: 6.53, ECI: -0.096), and parity (contribution: 36.96, ECI: -0.281) were positive contributors, while mother's current age (contribution: -2.60, ECI: -0.027) was a negative contributor to ANC service inequality in Ethiopia. The residual component 36.48% reflects that part of ANC service inequalities could not be explained by the selected predictors across wealth quintiles (Table 4).

Additionally, household family size (contribution: 7.08, ECI: -0.166), birth order (contribution: 11.21, ECI: -0.096), parity (contribution: 13.48, ECI: -0.281), and ANC service (contribution: 64.98, ECI: 0.115) were positive contributors, while mother's current age (contribution: -2.26, ECI: -0.027) and region (contribution: -0.29, ECI: 0.029) were negative contributors to delivery care service inequality in Ethiopia (Table 4).

Furthermore, region (contribution: 4.51, ECI: 0.029), birth order (contribution: 0.75, ECI: -0.096), parity (contribution: 5.57, ECI: -0.281), ANC service (contribution: 51.51, ECI: 0.115), and delivery service (contribution: 26.97, ECI: 0.234) were positive contributors, while mother's current age (contribution: -0.56, ECI: -0.027) and household family size (contribution: -8.34, ECI: -0.166) were negative contributors to PNC service inequality in Ethiopia. The residual component 19.59% reflects that part of PNC service inequalities could not be explained by the selected predictors across wealth quintiles. (Table 4).

## Discussion

The aim of this study was to examine wealth disparities in maternal health service utilization among reproductive-age women in Ethiopia using the EMDHS 2019. The study revealed that there is disparity of maternal health service utilization across household wealth status.

Our study findings indicate that the utilization of maternal health services, including ANC service, delivery care service, and PNC service, exhibits pro-rich patterns. This finding aligns with several previous studies [12, 19, 21, 43, 44, 46]. Specifically, ANC utilization has been found to favor individuals from higher wealth quintiles in studies [13, 14, 16–18], while facility-based deliveries have shown a pro-rich concentration [23, 24], and PNC utilization has also demonstrated a pro-rich distribution [8, 34, 39, 62, 63, 46]. The underlying reasons for this pro-rich pattern could be multifaceted. Factors such as financial resources, education levels, and access to healthcare facilities may contribute to the differential utilization of maternal health services, with wealthier individuals having more means and opportunities to seek and utilize these services.

However, it is worth noting that there are exceptions to this trend. For instance, in China and SSA, ANC utilization has been observed to be higher among lower wealth quintiles [42, 43]. In Ethiopia, ANC attendance exhibits a slight concentration favoring individuals from lower socio-economic backgrounds [38]. Furthermore, maternal healthcare inequality is more pronounced among underprivileged mothers in Pakistan and Bangladesh [6]. Possible explanations for these deviations may include variations in healthcare policies, cultural norms, or the presence of targeted interventions specifically aimed at improving maternal health service utilization among disadvantaged populations.

The decomposition analysis conducted in this study unveiled several factors that contribute to inequalities in ANC, delivery care service, and PNC service utilization. Household family size, region, birth order, and parity were positive contributors to ANC service wealth inequality. It is supported by different studies [14, 16, 20, 41, 45, 50]. Larger households, disparities in healthcare availability, and increased responsibilities contribute to reduced access. But a mother's current age was a negative contributor to ANC service inequality in Ethiopia [31, 45], meaning ANC service was lower among people of lower wealth status. This might be due to limited awareness and social barriers.

In addition household family size, birth order, parity, and ANC service were positive contributors to delivery service inequality in Ethiopia [11, 24, 49–51]. This might be due to financial constraints, competing priorities, and limited access to healthcare resources. But mothers' current age and region were negative contributors to

**Table 4** Decomposition of maternal health services (ANC, Delivery and PNC) by household wealth status

Variable	Category	ANC service			Delivery care service			PNC service		
		Elasticity	ECI	PC	Elasticity	ECI	PC	Elasticity	ECI	PC
Mother's current age	15-20			1			1			1
	20-34	0.308	0.013	3.486**	0.128	0.013	0.002	0.013	0.013	-0.097
	35-49	0.176	-0.040	-6.081**	0.174	-0.040	-0.007	-0.040	-0.040	-0.015
<b>Subtotal</b>			<b>-0.027</b>	<b>-2.595</b>		<b>-0.027</b>		<b>-0.027</b>	<b>-0.027</b>	
household family size	1-3			1			1			1
	4-7	0.042	-0.015	-0.554*	-0.222	-0.015	0.003	-0.015	-0.015	0.076
	>=8	-0.020	-0.151	2.669*	-0.087	-0.151	0.013	-0.151	-0.151	0.059
<b>Subtotal</b>			<b>-0.166</b>	<b>2.115</b>		<b>-0.166</b>		<b>-0.166</b>	<b>-0.166</b>	
Region	Developing regions			1			1			1
	Developed regions	0.812	0.029	20.514*	-0.023	0.029	-0.001	0.029	0.029	0.187
<b>Subtotal</b>			<b>0.029</b>	<b>20.514</b>		<b>0.029</b>		<b>0.029</b>	<b>0.029</b>	
Birth order	1			1			1			1
	2-4	-0.098	0.043	-3.665*	-0.184	0.043	-0.008	0.043	0.043	0.026
	>=5	-0.084	-0.139	10.191*	-0.246	-0.139	0.034	-0.139	-0.139	-0.001
<b>Subtotal</b>			<b>-0.096</b>	<b>6.526</b>		<b>-0.096</b>		<b>-0.096</b>	<b>-0.096</b>	
Parity	=<2			1			1			1
	3-5	-0.106	-0.074	6.802*	-0.123	-0.074	0.009	-0.074	-0.074	-0.012
	>=6	-0.168	-0.207	30.162*	-0.108	-0.207	0.022	-0.207	-0.207	-0.028
<b>Subtotal</b>			<b>-0.281</b>	<b>36.964</b>		<b>-0.281</b>		<b>-0.281</b>	<b>-0.281</b>	
ANC Visit	No			1			1			1
	Yes			1.320		0.115	0.152	0.115	0.115	0.540
<b>Subtotal</b>						<b>0.115</b>		<b>0.115</b>		
Delivery place	Home									
	Institutional									0.139
<b>Subtotal</b>										0.234
<b>Subtotal</b>										<b>0.234</b>
<b>Subtotal</b>										<b>0.097</b>
<b>Explained ECI</b>										<b>80.41%</b>
<b>Unexplained residuals</b>										<b>19.59%</b>

Note: ECI: Concentration index, AC: Absolute contribution, PC: Percentage contribution

\*p-value < 0.001 \*\*p-value < 0.05

delivery service inequality in Ethiopia, meaning delivery service was lower among those with lower wealth status. This could be attributed to socioeconomic factors, limited awareness or education, and disparities in healthcare availability and accessibility across different regions.

Furthermore, region, birth order, parity, ANC service, and delivery care service were positive contributors to PNC service inequality in Ethiopia. This finding is supported by previous studies conducted in Benin, South Asia, SSA, and India [10, 15, 45, 46]. But mother's current age and household family size were negative contributors to PNC service inequality in Ethiopia. Access to healthcare is closely tied to financial status, as wealthier individuals can afford PNC services and have access to higher-quality medical facilities. Regional disparities in healthcare infrastructure also affect PNC utilization, with urban areas generally having superior healthcare facilities. Inequalities in ANC visits and delivery locations, influenced by factors such as socioeconomic status, cultural beliefs, and facility accessibility, can contribute to disparities in PNC service delivery.

## Conclusion

The study revealed that maternal health service utilization is pro-rich. Mother's current age, household family size, region, birth order, and parity were contributors of maternal health service utilization disparities. Besides, ANC visits, and delivery service were found to be major contributors to PNC service utilization by decomposition analysis. Therefore, reducing economic gaps is essential to increasing the use of maternal health services.

## Policy implication

To improve access and usage among low-income women, policymakers can develop programs including increasing the number of free or subsidized services and providing transportation.

## Abbreviations

ANC	Antenatal care
EI	Erreygers concentration index
EDHS	Ethiopian demographic and health survey
FMoH	Federal ministry of health
PNC	Postnatal care
SSA	Sub-Saharan Africa

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## Author contributions

AMM designed the study, performed analysis and interpretation of the data, drafted the paper, and prepared the manuscript. NK assisted in the design and approved the article with revisions. AD assisted in the design, approved the article with revisions, and participated in data analysis. SM revised the subsequent write-up of the paper. YT revised the subsequent write-up of the paper. All authors reviewed the manuscript. All authors reviewed the manuscript.

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## Data availability

The datasets analyzed during the current study are available on the DHS website. <https://dhsprogram.com/>.

## Declarations

### Ethics approval and consent to participate

A secondary data source from the 2019 mini-EDHS was used. The approval letter was obtained from the Measure DHS, and the data set was downloaded from the DHS website. <https://dhsprogram.com/>. The study was conducted in accordance with the Declaration of Helsinki, 2008.

### Consent for publication

Not applicable.

### Competing interests

The authors declare no competing interests.

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