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Socioeconomic inequalities in skilled attendance at birth and caesarean section rates in Myanmar 2015–2016: a cross-sectional study

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ABSTRACT

Objectives This study aims to assess inequalities in skilled birth attendance and utilisation of caesarean section (CS) in Myanmar.

Study design Cross-sectional study design.

Setting and population We used secondary data from the Myanmar Demographic and Health Survey (2015–2016). Our outcome measures of skilled birth attendance and utilisation of CS were taken from the most recent birth of interviewed women. Absolute and relative inequalities across several sociodemographic characteristics were assessed and evaluated by calculating rate differences, rate ratio and concentration indexes.

Results More than one-third (36%, 95% CI 32.5% to 39.4%) of women gave birth without a skilled birth attendant present at their most recent birth. 40.7% (95% CI 37.8% to 43.7%) gave birth in healthcare facilities, and the CS rate was 19.7% (95% CI 17.9% to 21.8%) for their most recent birth. The highest proportion of birth without a skilled provider was found in the hilly regions and rural residents, poorest and less educated women, and those with less than four antenatal care visits. Inequalities in birth without a skilled provider were observed across regions, place of residence, wealth quintile, education level and number of antenatal care taken. The highest rate of CS was found among plain regions and urban residents, richest women, more than secondary education, those with more than four antenatal care visits and in private health facilities. Inequalities in CS utilisation were observed across place of residence, wealth quintiles, education level, number of antenatal care taken and type of health facilities.

Conclusion This study provides evidence regarding inequalities in maternal health service utilisation in Myanmar. Increasing maternal health service availability and accessibility, promoting quality of care and health education campaigns to increase maternal health services utilisation are recommended.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We used nationally representative data, Myanmar Demographic and Health Survey (MDHS) 2015–2016.
⇒ The interpretation of inequality regarding maternal health in this study is important for identifying strategies to reduce inequalities among pregnant women.
⇒ Due to the cross-sectional nature of MDHS 2015–2016, we could not identify underlying reasons for the observed inequalities.
⇒ It is important to emphasise that MDHS 2015–2016 collected data 5 years preceding the survey. The situation in 2022 may have changed, but there are no updated data to explore trends or changes in rates.

BACKGROUND

Despite global efforts to improve maternal health, about 295 000 maternal deaths occurred during 2017, predominantly in low-income and lower-middle-income countries.[1] Access to quality maternal health services, including the presence of skilled birth attendants (SBAs), is crucial for preventing most maternal deaths.[1 2] While caesarean section (CS) can be a life-saving procedure in cases of complications, its unnecessary use can pose risks rather than benefits.[3] Increasing rates of CS have raised public health concerns due to the associated maternal and perinatal risks, cost issues, healthcare efficiency and inequalities.[4–7] Potential short-term and long-term complications resulting from CS include placenta accreta, uterine rupture for the woman, and stillbirth, prematurity, and low birth weight for the baby.[8–11]

Understanding socioeconomic inequalities in healthcare access and utilisation is essential for developing appropriate policies to ensure equitable care for all individuals.[12] Adequate access to maternity care services, including CS, plays a critical role in reducing maternal and perinatal morbidity and mortality.[13] Globally, 86% of births were supported by an SBA, but with substantial variation across countries and regions. In developing regions, the proportion of births supported by an SBA increased from 53% in

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1990 to 61% in 2007, with significant disparities in South Asia and sub-Saharan Africa.[14] Across Africa, the prevalence of SBA ranges from 13.8% in Tanzania to 91.2% in Rwanda in 2015.[15] Moreover, global patterns of inequity exist regarding which women have access to SBAs, with wealthier women, women with higher levels of education and those residing in urban areas having a higher likelihood of SBA access.[16–18]

In 2015, the WHO indicated that CS rates greater than 10%–15% at the population level do not lead to reductions in maternal and newborn mortality.[7] Low CS rate (eg, <10% at the population level) can indicate limited access to emergency obstetric care, while high rates may suggest the occurrence of CS without medical indications. CS rates vary significantly across countries, ranging from less than 1% in South Sudan to 58% in the Dominican Republic in 2018.[19] Furthermore, CS rates have been steadily increasing in recent years, nearly doubling globally from 12% in 2010 to 21% in 2015.[20] Despite these increasing trends, high CS rates do not necessarily indicate universal access for all women in need. CS is more common among affluent, educated women and is more frequently performed in private facilities rather than public ones.[20 21] Factors such as women's education levels, their place of residence and the number of antenatal care (ANC) visits can contribute to inequalities in CS.[22 23]

Myanmar has made progress in improving maternal health, with a 60.7% improvement in the Maternal Mortality Ratio (MMR) between 1990 and 2015.[24] However, in Myanmar, only 60% of births were assisted by SBAs in 2015[25] and resulted in the highest MMR (250 maternal deaths per 100 000 live births in 2017) among The Association of Southeast Asian Nations.[25 26] Limited access to SBAs and community preferences for traditional birth attendants contribute to the low rates of SBA utilisation in Myanmar.[27] In 2015 (most recent data), the CS rate in Myanmar was 17% among all births, and Yangon Region has the highest rates among all states and regions at 26%.[25] A study by Myint *et al* demonstrated significantly higher CS rates among adolescents, affluent individuals and educated women in the Yangon Region.[28] However, it is important to note that the Yangon Region is one of the most developed regions in Myanmar and serves as the heart of the national economy. Currently, limited research exists on investigating inequalities in SBA utilisation and CS rates in Myanmar, impeding the design of policies and programmes to improve the quality and accessibility of care. Therefore, the objective of this paper is to identify socioeconomic inequalities in skilled birth attendance and the utilisation of CS using nationally representative data from the Myanmar Demographic and Health Survey (MDHS) 2015–2016. Specifically, we explore the relationship between socioeconomic factors of maternal age, place of residence, wealth, and education and the use of maternity care services: ANC, skilled birth attendance, place of birth and CS.

METHODS

Setting and maternal health services in Myanmar

The Republic of the Union of Myanmar is a south-east Asian country neighboured by Bangladesh and India in the northwest, China in the northeast, Laos and Thailand in the east and southeast. It is divided into seven states, seven regions and an administrative division (the Nay Pyi Taw council territory). These states and regions are further subdivided into districts and townships, totalling 74 districts and 330 townships. Geographically, states and regions have diversities of plains, delta, coastal and hilly regions. Myanmar has a population of over 51 million people, of which nearly 70% reside in rural areas.[29]

Maternal health and child health services are a main priority of the National Health Plan in Myanmar. Maternal healthcare services are delivered by station hospitals (subtownship level), rural health centres (RHC) and sub-RHCs in rural areas and urban health centres, maternal health centres, township/district/tertiary hospitals in urban areas. Station hospitals are the first level of facility where doctors are available. Midwives and female health visitors are entry points in providing maternal health services, especially in rural areas. According to MDHS 2015–2016, one in three births took place in health facilities and 60% of births were assisted by SBAs in the past 5 years.[25] Of home/community births in Myanmar, one-third were attended by skilled healthcare providers.[25]

Source of data

This study used secondary data from the MDHS 2015–2016, a nationally representative (urban and rural) cross-sectional survey which followed a stratified two-stage sample design with a 98% response rate. The first stage involved selecting clusters, with selection probability proportional to size by separating each state or region into urban and rural areas, each of which formed a separate sampling stratum. A total of 442 clusters (123 urban and 319 rural) were selected independently. Then, systematic random sampling was employed to select a fixed number of 30 households from each cluster. The survey used tablet computer-assisted field editing procedures and all completed questionnaires were entered into the tablets while in the field by the field editors. Re-entry of data was done by data processing personnel in Nay Pyi Taw for verification process using the CSPro computer package.[25] Information regarding the most recent birth of the interviewed women was used in this study.

Variables

The primary outcome variable was stratified into mutually exclusive categories related to mode and place of birth: (a) CS at a healthcare facility, (b) vaginal birth at healthcare facility, (c) SBA at vaginal birth at home/others and (d) no SBA vaginal birth at home. The outcome variable was derived from data collected on women's self-report to the survey questions: Who assisted with the delivery of (NAME)? Where did you give birth to (NAME)? Was (NAME) delivered by caesarean, that is, did they cut

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your belly open to take the baby out? Giving birth in the healthcare facility referred to public healthcare facilities, private healthcare facilities or NGOs facilities. SBA was defined as the presence of medical doctors, nurses or midwives/female health visitors attending theo birth, either at home or in the community.

Inequalities for CS rate and SBA were evaluated across socioeconomic variables. These variables have been shown to influence CS rate and SBA in other contexts.[18 22 23 28 30] The regions were grouped according to characteristics of regions common in Myanmar: delta and lowland (Ayeyarwady, Yangon and Bago Regions, Mon and Karen States), Hills (Kachin, Kayah, Chin and Shan States), Coastal (Rakhine State and Tanintharyi Region) and Plains (Magway, Mandalay, Sagaing Regions and Nay Pyi Taw Union Territory).[31] Inequalities across regions used the rate of Plains and Hilly regions as the reference category. Inequalities between the woman's place of residence (urban/rural) were also assessed. Inequalities between poorer and richer women were assessed through five wealth quintiles (Q1 (poorest) to Q5 (richest)). Maternal education was categorised as no education and primary, secondary and higher education and inequalities were estimated between no education and primary versus higher education. The types of health facilities were categorised into three groups: public (including government hospitals and health centres), private (private hospitals and clinics, as well as the non-governmental sector) and home/other settings.

Statistical analysis

We analysed the data using STATA software (SE V.15 STATA)[32] and plotted figures in STATA and R software.[33] We plotted maps using the shapefile provided by the Demographic and Health Survey (DHS) using the 'ggplot2' package in R. Descriptive analysis was performed between inequality variables and the outcome variable. Absolute and relative inequalities between subgroups were assessed and evaluated by calculating rate differences (RD), rate ratio and concentration indexes (CIXs). The CIX ranges from −1 to +1, with 0 indicating no inequality, represented by a line of equality (a 45° line running from the bottom left corner). A positive CIX value below the line of equality indicates that the health variable is concentrated among the advantaged population (eg, the rich). The Eyrregers CIX was calculated to assess wealth-based and education-based inequalities, using the categorical wealth index and highest education level variables. This calculation was done by using the 'conindex' command in STATA.[34] We constructed the concentration curve by using the 'lorenz' command in STATA.[35] Weight factors and the 'svyset' command were applied in all analyses to account for the two-stage stratified cluster sampling design. A 95% CI was used to report the prevalence and inequality estimates.

RESULTS

The background characteristics of the 3476 respondents are described in table 1. The mean age of the respondents was 30.8 (SD of ±6.6 years), with over half (52%) falling within the age range of 25–34 years. Approximately three-quarters (76%) of the respondents resided in rural areas. The majority of respondents (62%) had an educational level lower than secondary. Almost half (49%) of the respondents belonged to the lowest two wealth quintiles. Regarding birth-related factors, 41% of women had their most recent birth at a healthcare facility, and 59% had received ANC at least four times.

More than one-third (36%, 95% CI 32.5% to 39.4%) of women gave birth without an SBA present in their most recent childbirth. 40.7% (95% CI 37.8% to 43.7%) of women gave birth in healthcare facilities with a skilled provider, and the CS rate was 19.7% (95% CI 17.9% to 21.8%) for their most recent birth. Yangon and Mandalay Regions exhibited the highest utilisation of ANC, skilled birth attendance, birth in a health facility and birth by CS (figure 1). Analysing patterns in inequality, we observed that women in the poorest two quintiles, those with no education or primary school level and those residing in rural areas significantly lagged behind the national average in terms of receiving ANC, skilled birth attendance, birth in a health facility and birth by CS (figure 2).

The highest rate of CS was found in plains regions and among urban residents, women in the richest quintile, those with education higher than secondary level, those who had at least 4 ANC visits, and those who sought care in the private health facilities. The largest absolute difference in CS rate was observed between women with higher education and those with no education or primary school level (RD 44.4%, 95% CI 35.8% to 53.1%), followed by the difference between the richest and poorest quintiles (RD 41.8%, 95% CI 35.7% to 47.8%) (table 2).

Vaginal birth at a healthcare facility was most common among younger women (aged 15–29 years), those residing in the delta region and urban residents, women from higher wealth quintiles and those who had at least four ANC visits. The largest absolute difference in vaginal birth at a healthcare facility was found between the richest and poorest quintiles (RD 23.3%, 95% CI 17.7% to 28.8%), followed by between urban and rural residents (RD 17.4%, 95% CI 13.1% to 21.7%) (table 2).

Vaginal birth at home by a skilled provider was common among those residing in plain regions, rural residents and those with no education or primary level. The largest absolute difference in vaginal birth at home by skilled provider was found between women with higher education and those with no education or primary school level (RD −13.6%, 95% CI −18.0% to −9.3%) (table 2).

The highest proportion of home births without SBA was found among coastal regions and rural residents, women in the poorest quintile, those with education levels lower than secondary and those with fewer than four ANC visits. The largest absolute inequality in birth without SBA was observed between the richest and poorest quintiles (RD −56.9%, 95% CI −62.0% to −51.8%), followed by the difference between higher education and no education/

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Table 1 Per cent distribution of women who gave birth in the 5 years preceding the survey by selected characteristics, MDHS 2015–2016 (n=3476)*

Characteristics	Number (%)
Age (years)	
15–19	86 (2.5)
20–24	561 (16.2)
25–29	903 (26.0)
30–34	888 (25.5)
35–39	650 (18.7)
40–44	302 (8.7)
45–49	86 (2.5)
Mean±SD	30.8±6.6 years
States/regions	
Kachin	130 (3.7)
Kayah	23 (0.7)
Kayin	106 (3.1)
Chin	40 (1.2)
Sagaing	389 (11.2)
Tanintharyi	99 (2.9)
Bago	321 (9.3)
Magway	265 (7.6)
Mandalay	372 (10.7)
Mon	116 (3.3)
Rakhine	236 (6.8)
Yangon	377 (10.8)
Shan	445 (12.8)
Ayeyarwady	476 (13.7)
Nay Pyi Taw	81 (2.4)
Residence	
Urban	820 (23.6)
Rural	2656 (76.4)
Maternal education	
No education	555 (16.0)
Primary	1585 (45.6)
Secondary	1042 (30.0)
Higher	294 (8.4)
Wealth quintiles	
Poorest	945 (27.2)
Poorer	755 (21.7)
Middle	608 (17.5)
Richer	624 (18.0)
Richest	544 (15.7)
Antenatal care (ANC) visits	
No ANC	460 (13.2)
<ANC four times	966 (27.8)
≥ANC four times	2049 (59.0)
Type of facility	
Public	1176 (33.8)
Private	239 (6.9)
Home/others	2061 (59.3)

*Weighted percentages.
MDHS, Myanmar Demographic and Health Survey.

primary school level (RD −42.4%, 95% CI −46.4% to −38.4) (table 2).

The CIX revealed that birth without a skilled provider was concentrated among poorer women (CIX −0.47, 95% CI −0.53 to −0.42, p<0.001) and women with lower education levels (CIX −0.31, 95% CI −0.35 to −0.27, p<0.001). Conversely, CSs were concentrated among wealthier women (CIX 0.31, 95% CI 0.26 to 0.35, p<0.001) and those with higher education levels (CIX 0.24, 95% CI 0.20 to 0.27, p<0.001) (figure 3).

DISCUSSION

This study highlights inequalities in receiving maternal healthcare services across women's socioeconomic status

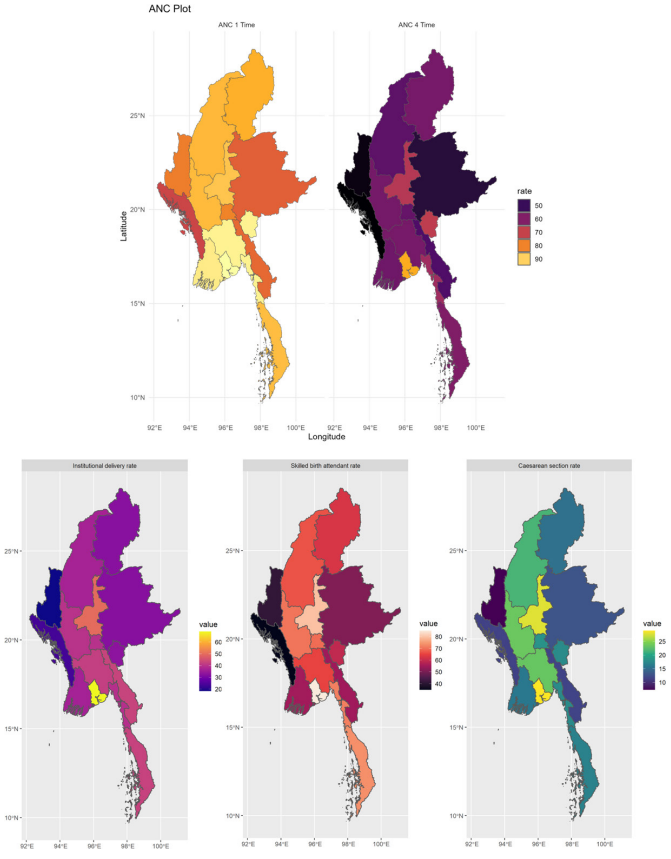


Figure 1 Distribution of antenatal care (ANC) coverage, rate of birth in health facilities, SBA and caesarean section rate by region. SBA, skilled birth attendant.

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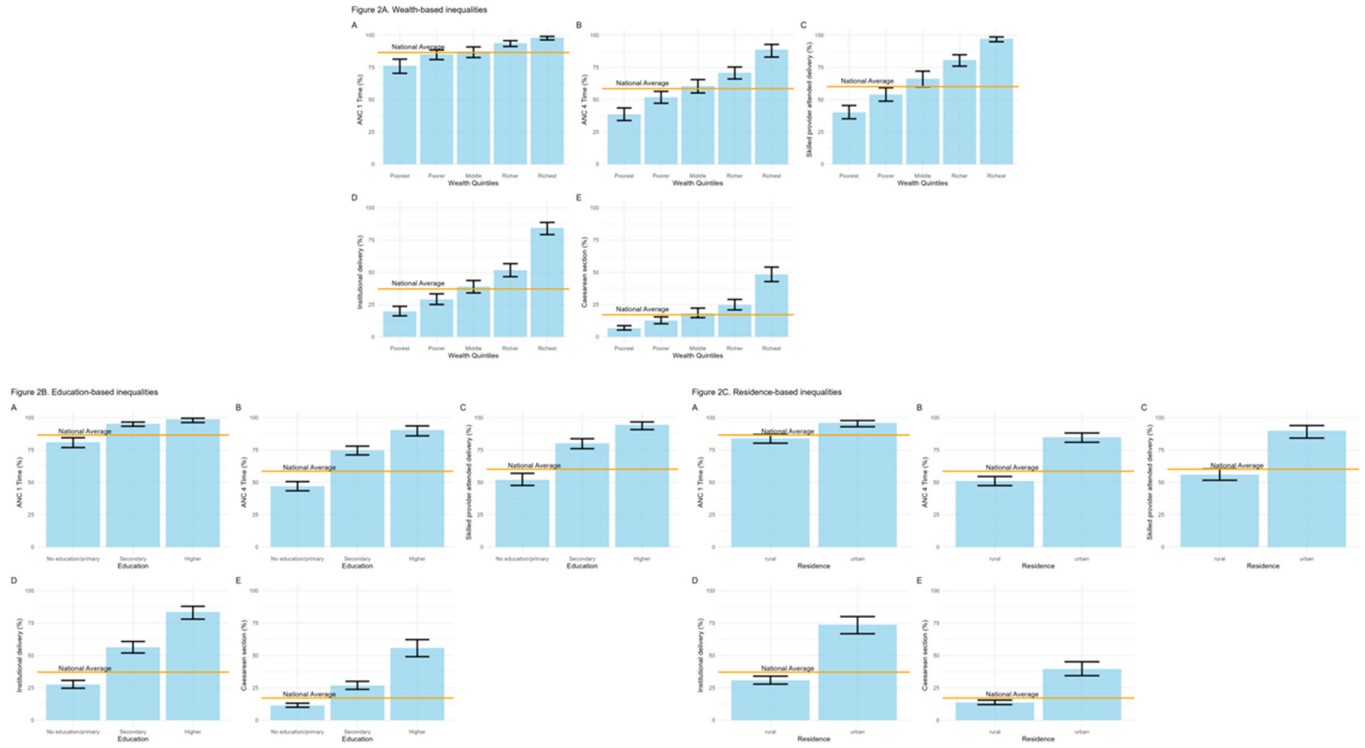


Figure 2 Inequalities of antenatal care (ANC), skilled attendance at birth, birth in a health facility and caesarean section

in Myanmar. Substantial inequalities exist in women receiving ANC, SBA, birth in health facilities and CS across wealth quintiles, maternal education, place of residence, regions and type of health facility. Higher rates of ANC, SBA, birth in health facilities and CS were observed among women who were richer, more educated, residing in urban areas and living in the plains or delta/lowland regions. The widest absolute inequality in the use of maternal healthcare services was observed in richest versus poorest and higher educated versus no educated/primary educated women.

Less than two-thirds of pregnant women in Myanmar received at least four ANC visits, which is lower than most countries in the south-east Asian Region.[36] In Myanmar, inequalities in receiving ANC were observed and ANC visits were higher among richer and more educated women and urban residents. Furthermore, low numbers of ANC visits were observed among women who gave birth without SBA. Although maternal health is a priority public health issue and free essential drugs and services for pregnant women are provided at public health facilities,[37] significant gaps remain in ensuring all women have equitable access to ANC. Other studies in Myanmar have shown that women with a high degree of mass media exposure were more likely to receive ANC and there is a need for broad dissemination of maternal healthcare schemes in rural parts of the country.[38 39] Furthermore, to reduce maternal mortality, it is critical that pregnant women gain access to sufficient and quality obstetric services. Previous studies in the Philippines and Indonesia also showed that differences in wealth, education and type of residence affected the use of ANC.[40]

In this study, we found a high proportion of births without SBA in Myanmar. This may hinder reaching the SDGs target of MMR less than 70 per 100 000 live births in 2030. SBA has been recognised as a life-saving mechanism for both women and babies and is the key strategy for averting maternal and newborn mortality and morbidity.[41] Our study shows that women in the poorest wealth quintile, with no education or primary level and rural residents mostly gave birth without an SBA, which is similar to other research from African and Southeast Asian countries.[42 43] In Myanmar, the main reason for not giving birth without SBA was lack of access and community acceptance of, and preferences for, traditional birth attendants.[27] The lowest rate of births without SBA was observed in the coastal and hilly regions, where transportation poses challenges and access to sufficient and quality obstetric services is an issue.[27] Our analysis shows a similar pattern of inequalities as other Southeast Asian countries, such as Indonesia, where higher rates of CS are observed among richer women, women with higher levels of education and women in urban settings.[30] Skilled provider shortages also contribute to challenges in the delivery of consistent maternal and reproductive health services. Therefore, auxiliary midwives have been trained in task-shifting to support midwives to care for mothers and children, especially in hard-to-reach areas, with the aim to have at least one auxiliary midwife in every village in Myanmar.[44–46]

We found only one-third of women gave birth in a health facility. Inequalities in giving birth at health facilities were observed, with women in the richest wealth quintile, higher education level, urban resident and those residing

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Table 2 Inequalities of skilled attendance at birth and caesarean rate, MDHS 2015–2016

	Total (n=3476)	Caesarean section (n=686)	Vaginal birth at healthcare facility (n=729)	SBA vaginal birth at home/others (n=814)	No SBA vaginal birth at home/others (n=1247)
	n	%	%	%	%
Total	3476	19.7 (17.9, 21.8)	21.0 (18.9, 23.2)	23.4 (21.1, 26.0)	35.9 (32.5, 39.4)
Age group (years)					
15–29	1550	18.0 (15.5, 20.8)	23.9 (21.0, 27.1)	21.9 (18.9, 25.2)	36.2 (32.0, 40.5)
30–39	1538	20.8 (18.4, 23.3)	19.6 (17.2, 22.2)	25.2 (22.2, 28.5)	34.4 (30.7, 38.4)
40–49	388	22.5 (17.4, 28.8)	14.7 (10.8, 19.7)	22.4 (18.0, 27.6)	40.4 (33.9, 47.1)
Difference (aged 40–49 to aged 15–29)		4.6 (–0.5, 9.8)	–9.2 (–13.8, –4.7)	0.5 (–4.7, 5.8)	4.3 (–2.7, 11.3)
Ratio (aged 40–49:aged 15–29)		1.26 (9.8, 1.6)	0.6 (0.5, 0.8)	1.0 (0.8, 1.3)	1.1 (0.9, 1.3)
Place of residence					
Coastal	335	13.1 (9.4, 18.0)	15.9 (11.9, 21.0)	17.2 (12.6, 23.1)	53.8 (44.1, 63.2)
Hills	639	13.3 (9.4, 18.7)	17.8 (13.7, 22.8)	22.0 (16.3, 28.9)	46.9 (38.3, 55.7)
Delta and lowland	1396	21.0 (18.1, 24.2)	25.9 (22.3, 29.8)	20.3 (17.0, 23.9)	32.9 (28.3, 37.9)
Plains	1107	23.9 (20.4, 27.8)	18.2 (15.0, 21.7)	30.2 (25.5, 35.3)	27.8 (21.7, 34.8)
Difference % (plains–hills)		10.5 (6.5, 14.6)	0.3 (–3.8, 4.4)	8.3 (3.4, 13.1)	–19.2 (–25.4, –13.1
Ratio (plains:hills)		1.8 (1.4, 2.3)	1.0 (0.8, 1.3)	1.4 (1.1, 1.7)	0.6 (0.5, 0.7)
Place of residence					
Urban	820	39.6 (34.5, 44.9)	34.2 (29.8, 38.9)	16.2 (12.2, 21.1)	10.1 (6.7, 14.9)
Rural	2656	13.6 (11.8, 15.6)	16.9 (14.7, 19.3)	25.7 (22.8, 28.7)	43.8 (39.7, 48.0)
Difference % (urban–rural)		25.9 (21.4, 30.4)	17.4 (13.1, 21.7)	–9.6 (–12.9, –6.2)	–33.7 (–37, –30.4)
Ratio (urban:rural)		2.9 (2.5, 3.4)	2.0 (1.7, 2.4)	0.6 (0.5, 0.8)	0.2 (0.18, 0.29)
Wealth quintiles					
Q1 (poorest)	945	6.7 (4.8, 9.2)	12.7 (9.6, 16.7)	21.1 (17.2, 25.6)	59.5 (53.9, 64.9)
Q2	755	12.5 (9.9, 15.8)	16.0 (12.8, 19.8)	25.6 (21.7, 30.0)	45.8 (40.8, 50.9)
Q3	608	18.2 (14.8, 22.3)	20.4 (16.9, 24.5)	27.6 (23.2, 32.4)	33.8 (27.8, 40.2)
Q4	624	24.7 (20.4, 29.5)	26.9 (22.7, 31.6)	29.3 (25.1, 33.9)	19.2 (15.0, 24.1)
Q5 (richest)	545	48.4 (43.0, 53.9)	36.0 (31.0, 41.3)	13.1 (9.8, 17.3)	2.5 (1.5, 4.4)
Difference % (Q5–Q1)		41.8 (35.7, 47.8)	23.3 (17.7, 28.8)	–8.0 (–12.2, –3.8)	–56.9 (–62, –51.8)
Ratio (Q5:Q1)		7.3 (5.5, 9.7)	2.8 (2.2, 3.6)	0.6 (0.5, 0.8)	0.04 (0.02, 0.07)
Maternal education					
No education or primary school	2140	11.4 (9.7, 13.2)	15.9 (13.6, 18.6)	24.9 (21.9, 28.1)	47.9 (43.7, 52.0)
Secondary school	1042	26.8 (23.7, 30.1)	29.4 (26.1, 32.9)	24.0 (20.8, 27.5)	19.9 (16.3, 23.9)
Higher	294	55.7 (48.9, 62.3)	27.8 (22.4, 34.1)	11.1 (7.5, 16.0)	5.4 (3.0, 9.3)
Difference % (higher–no education or primary school)		44.4 (35.8, 53.1)	11.9 (5.7, 18.2)	–13.6 (–18.0, –9.3)	–42.4 (–46.4, –38.4)
Ratio (higher:no education or primary school)		4.9 (4.0, 6.0)	1.8 (1.4, 2.2)	0.5 (0.3, 0.6)	0.11 (0.06, 0.19)
Antenatal care (ANC) visits (n=3567)					
<ANC 4 times	1426	8.7 (7.0, 10.8)	11.7 (9.6, 14.4)	21.5 (18.2, 25.2)	58.1 (53.4, 62.7)
≥ANC 4 times	2049	27.4 (24.9, 30.0)	27.4 (24.6, 30.3)	24.8 (22.0, 27.8)	20.4 (17.6, 23.6)
Difference		18.7 (16.0, 21.5)	15.7 (12.8, 18.5)	3.3 (1.1, 6.6)	–37.7 (–42.1, –33.3
Ratio		3.2 (2.6, 3.9)	2.3 (2.0, 2.8)	1.2 (1.0, 1.3)	0.35 (0.3, 0.4)

Continued

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Table 2 Continued

	Total (n=3476)	Caesarean section (n=686)	Vaginal birth at healthcare facility (n=729)	SBA vaginal birth at home/others (n=814)	No SBA vaginal birth at home/others (n=1247)
	n	%	%	%	%
Type of facility					
Public	1176	44.6 (41.2, 48.1)	55.4 (51.9, 58.8)	–	–
Private	239	67.5 (58.7, 75.2)	32.5 (24.8, 41.3)	–	–
Home	2061	0	–	–	–
Difference % (private–public)		23.1 (12.0, 34.3)	–22.7 (–31.1, –14.3)	–	–
Ratio (private:public)		1.5 (1.3, 1.8)	0.6 (0.5, 0.8)	–	–

MDHS, Myanmar Demographic and Health Survey; SBA, skilled birth attendant.

in the delta and lowland regions having the highest rates. The main reasons for home or community-based births were difficult access to the hospital, traditional beliefs around birthing at home and limited knowledge about the benefits of birth in health facilities.[27 47 48] Limited access to respectful maternity care is another important factor for women to give birth in health facilities, as many

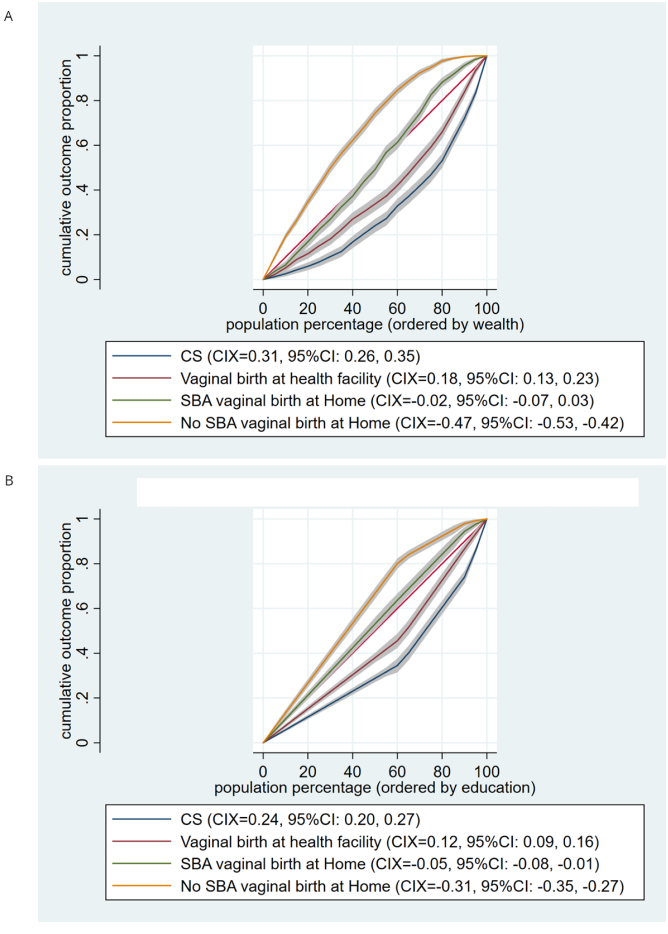


Figure 3 Relative wealth-based and education-based inequality in mode and place of birth, represented using concentration curve. CIS, Concentration Index; CS, caesarean section; SBA, skilled birth attendant.

do not allow labour companionship, have substandard maternal services, mistreat women during childbirth and do not maintain women's privacy or dignity.[49 50]

In Myanmar, 19.7% of births were by CS, exceeding the recommended optimal rate of 10%–15%.[7] Furthermore, it is important to note that only one-third of births happened in health facilities. In our study, CS rate is notably higher in the Yangon and Mandalay Regions. In contrast, the CS rate is lowest in the Chin State, which is a hilly region. Yangon and Mandalay regions are among the most developed areas in Myanmar, characterised by advancements in the economy, education, healthcare and transportation infrastructure. The CS rate is significantly higher among richer, more educated women and urban residents. Similar results were found in a study exploring inequalities in CS rates across 72 low-income and middle-income countries.[21] In Indonesia, an increasing trend of CS, together with sociodemographic inequalities, was observed in the past 30 years.[30] Our study found that the CS rate is higher among births in private hospitals compared with public hospitals. In Myanmar, women with uncomplicated pregnancy, who intended for elective CS, and have better financial situations, usually go to private hospitals for birth. To monitor increasing CS rates globally, WHO proposed the use of the Robson classification as a global standard and making the results of the classification publicly available.[51] A formative study in Myanmar reported that positive perceptions, acceptability and willingness to implement the classification exist in hospitals.

Myanmar has made progress in improving maternal health. The Ministry of Health focused on maternal, child and reproductive health issues as a priority by setting a Strategic Plan for Reproductive Health every 5 years. It included providing easy access to modern contraception, increasing skilled health service providers and promoting ANC services for pregnant women. Furthermore, active maternal death surveillance and response systems were implemented nationwide along with improving quality of care to reduce maternal mortality. However, Myanmar still has a high MMR compared with other countries in the region, with significant inequalities

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in maternal health service utilisation found in this study. Increasing maternal health service availability and accessibility, promoting quality of care and health education campaigns to increase maternal health services utilisation should be implemented.

Our study has the following strengths. To the best of our knowledge, this is the first study assessing maternal health inequalities using nationally representative data, MDHS 2015–2016, which is an internationally standardised tool with a significant data quality. Second, the interpretation of inequality regarding maternal health in this study is important for identifying strategies to prevent inequalities among pregnant women. There are some limitations in this study. First, as with all retrospective surveys relying on self-report information, the MDHS could be prone to various forms of bias including courtesy bias and recall bias. Due to the cross-sectional nature of MDHS 2015–2016, we could not identify the underlying reasons for the observed inequalities. It is important to emphasise that MDHS 2015–2016 collected data 5 years preceding the survey. The situation in 2022 may have changed, but there is no updated data to explore trends or changes in rates. Inequalities in maternal health indicators should be used to monitor change over time to understand the progress of health systems in addressing sociodemographic inequalities. Further trend analysis should be conducted with data from future rounds of MDHS.

CONCLUSION

This study provides evidence regarding inequalities in maternal health service utilisation in Myanmar. Substantial inequalities exist in women receiving ANC, SBA, birth in health facilities and CS across wealth quintiles, maternal education, place of residence, regions and type of health facility. Increasing maternal health service availability and accessibility, promoting quality of care, and health education campaigns to increase maternal health service utilisation are recommended.

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