

Institutional delivery and associated factors among women in Ghana: findings from a 2017–2018 multiple indicator cluster survey

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Background: Institutional delivery is essential in reducing maternal morbidity and mortality. We investigated the prevalence of institutional delivery and associated factors among women in Ghana.

Methods: National representative data from the 2017–2018 Ghana Multiple Indicator Cluster Survey was used for the analysis. The study included 3466 women, ages 15–49 y, who had a live birth in the last 2 y. Descriptive statistics were used to assess the prevalence of institutional delivery while multivariate logistic regression was used to assess the relationship between our variables of interest and institutional delivery.

Results: The prevalence of institutional delivery among women in Ghana was 77.89% (95% confidence interval [CI] 75.29 to 80.50). High-income households (adjusted odds ratio [aOR] 2.13 [95% CI 1.36 to 3.35]), attending antenatal care at least four times (aOR 2.37 [95% CI 1.54 to 3.65]) and knowing one's human immunodeficiency virus status (aOR 1.41 [95% CI 1.08 to 1.84]) were associated with higher odds of institutional delivery. Living in rural areas (aOR 0.43 [95% CI 0.27 to 0.67]), multiparity (aOR 0.59 [95% CI 0.41 to 0.85]) and no health insurance (aOR 0.57 [95% CI 0.44 to 0.74]) were associated with lower odds of institutional delivery.

Conclusions: The government of Ghana may need to focus on increasing health insurance utilization and antenatal care attendance in order to increase the coverage of institutional delivery.

Keywords: associated factors, Ghana, institutional delivery, maternal mortality, prevalence, women.

Introduction

The United Nations Sustainable Development Goal 3 aims to reduce the global maternal mortality rate to <70 deaths per 100 000 live births by 2030.¹ Yet the risk of maternal mortality continues to be high in sub-Saharan Africa (SSA) and other low- and middle-income countries (LMICs) compared with high-income countries.² In 2017, nearly 300 000 women died from complications related to pregnancy and childbirth and >90% of these deaths occurred in LMICs.¹ Several studies have indicated that >65% of maternal deaths recorded in LMICs were associated with direct obstetric causes such as haemorrhage, sepsis, abortion, hypertensive diseases of pregnancy and ruptured uterus and >77% of such deaths occurred during childbirth or within 24 h after childbirth.^{2–4}

One of the most important strategies for reducing maternal deaths in LMICs is to increase the number of women giving birth at a health facility.⁵ Institutional delivery (i.e. health facility deliv-

ery) can reduce maternal and newborn mortality and morbidity. Institutional delivery ensures a safe birth, reduces the occurrence of complications during delivery and immediately after birth and increases the survival of both mothers and their newborns.^{5–7} However, there is still low utilization of institutional delivery, which is a major challenge to addressing maternal mortality and morbidity in LMICs.² Institutional delivery is widely preferred and encouraged, as health facilities have skilled birth attendants that are professionally trained to manage complications associated with maternal mortality.⁸ While 81% of all births globally were assisted by a skilled birth attendant, only 60% of births in SSA were assisted by skilled birth attendants, where two-thirds of the world's maternal deaths occur.¹ This is alarming, as the World Health Organization (WHO) envisions a world where every pregnant woman and newborn receives optimum quality care during pregnancy, delivery and the postnatal period.⁹

Several socio-economic and obstetric factors have been shown to be associated with institutional delivery.

Socio-economic factors, including younger age (<35 y),^{10,11} high income status,¹²⁻¹⁴ living in an urban setting¹⁵⁻¹⁸ and having at least a secondary education^{12,15,19} were positively associated with institutional delivery. Obstetric factors such as primiparity, early antenatal care (ANC) visits, four or more ANC visits, receiving ANC messages regarding the importance of institutional delivery and knowledge of three or more danger signs in pregnancy and labour were also positively associated with institutional delivery.^{17,20-22}

The policy on free maternal healthcare in Ghana encourages institutional delivery and offers free maternal healthcare services.²³ Other programmes, such as the Community-based Health Planning and Services (CHPS), National Health Insurance Scheme and health education have been implemented in the country to increase the coverage of institutional delivery.^{24,25} Ghana has made significant strides by increasing the coverage of institutional delivery from 55% in 2007 to 79% in 2017.³ Despite the progress over the past decade, some studies have suggested that Ghana's high maternal mortality rate (310 deaths per 100 000 live births)³ is largely attributed to inadequate utilization of institutional delivery.^{3,26} Studies have demonstrated factors associated with institutional delivery in Ghana, but these studies are limited in generalizability, analysing data from selected geographical areas in the country.^{15,16,26} We analysed national representative data from the 2017–2018 Multiple Indicator Cluster Survey (MICS). Our primary aim was to assess the prevalence and factors associated with institutional delivery in Ghana. These findings will contribute to policy direction to improve maternal and child health in Ghana.

Methods

Study design and study population

We analysed data from the 2017–2018 MICS for Ghana. The MICS is a national representative household population-based survey.²⁷ A total of 3466 women, ages 15–49 y, with a live birth within the last 2 y were included in the study.

Data collection

The MICS uses a two-stage sampling procedure. The first stage involves selection of census enumeration areas from each sampling strata using a probability proportional to the number of households in each enumeration area. In the second stage, households are selected from enumeration areas using systematic random sampling. A description of the MICS sampling design and data collection procedures has been published.²⁷

Outcome variable

Institutional delivery was the outcome variable of interest. The outcome variable was binary and coded as 1 for women who delivered at a health facility and 0 for those who were reported not to have delivered at a health facility.

Predictor variables

The predictor variables were age, marital status, education, household wealth, place of residence, attended antenatal

care, parity, access to media, insurance status, know human immunodeficiency virus (HIV) status and number of sulfadoxine-pyrimethamine (SP) doses. SP was used to assess the intermittent preventive treatment regime in relation to institutional delivery. Age was categorized as 15–24, 25–34 and 35–49 y while marital status was categorized as never married and married/cohabitation. The other variables were categorized as follows: education (no formal education, primary education, secondary or higher education), health insurance status (no insurance, insurance), parity (primiparous, multiparous), attended antenatal care (0–3, ≥4), place of residence (rural, urban), know HIV status (yes, no) and number of SP doses (0–1, ≥2). Wealth quintiles were used to construct the household wealth variable. The upper two, middle and lower two wealth quintiles were used to represent high income, middle income and poor households, respectively. Access to media was also dichotomized as 'yes' for women who reported having access to any of the following: read the newspaper/magazine, listen to radio, watch television or use the internet at least once a week or almost every day, and 'no' for otherwise. Our variable selection was informed by previous studies^{11,28-30} and data available in the MICS.²⁷

Data analysis

Descriptive statistics were used to assess the prevalence and characteristics of the study population. Bivariate and multivariable logistic regression models were used to assess the relationship between all our predictor variables of interest and the outcome variable. We accounted for clustering and stratification and applied sampling weights to account for the complex sampling design. A p-value <0.05 was considered statistically significant. Descriptive statistics and logistic regression analysis were done using SAS version 9.3 (SAS Institute, Cary, NC, USA).

Results

Characteristics of the study population and prevalence of institutional delivery

A total of 3466 women who delivered a live birth within the last 2 y were included in the study. The majority of the women were 25–34 y of age (47.2%), while women ages 15–24 and 35–49 y were similarly distributed (27.5% and 25.4%, respectively). The majority of the women were married/cohabitating (83.0%) and had attained a secondary education or higher (56.6%) [Table 1].

The overall prevalence of institutional delivery was 77.89% (95% confidence interval [CI] 75.29 to 80.50). The prevalence of institutional delivery was similarly distributed among the age groups and marital status. The prevalence of institutional delivery was higher among women with a secondary or higher education compared with a primary education or no formal education. Institutional delivery was also higher among women in high-income households compared with women in middle-income and poor households. The prevalence of institutional delivery was higher among women living in urban communities compared with women living in rural communities. Institutional delivery was also higher among women who attended antenatal care at least four times compared with women who had attended antenatal care less than four times (Table 1).

Table 1. Characteristics of the study population and prevalence of institutional delivery

Characteristics	n (%)	Prevalence (95% CI)
Total sample	3466 (100)	77.89 (75.29 to 80.50)
Age (years)		
15–24	1158 (27.5)	77.52 (73.50 to 81.54)
25–34	1516 (47.2)	78.28 (74.88 to 81.68)
35–49	792 (25.4)	77.57 (73.31 to 81.84)
Marital status		
Never married	619 (17.0)	76.95 (71.22 to 82.68)
Married/cohabitation	2847 (83.0)	78.08 (75.40 to 80.77)
Education		
No formal education	928 (22.1)	66.07 (60.91 to 71.23)
Primary	666 (21.3)	71.81 (66.67 to 76.95)
Secondary or higher education	1872 (56.6)	84.79 (81.97 to 87.61)
Household wealth		
Poor	1741 (41.6)	66.20 (62.14 to 70.25)
Middle income	634 (19.5)	76.13 (71.06 to 81.21)
High income	1091 (38.9)	91.27 (88.52 to 94.03)
Place of residence		
Urban	1323 (42.3)	90.04 (86.81 to 93.26)
Rural	2143 (57.7)	69.01 (65.24 to 72.77)
Attended ANC		
0–3	505 (14.5)	49.6 (42.98 to 56.22)
≥ 4	2961 (85.5)	82.68 (80.31 to 85.04)
Parity		
Primiparous	918 (22.8)	84.56 (80.82 to 88.30)
Multiparous	2548 (77.2)	75.92 (72.96 to 78.88)
Access to media		
Yes	2434 (75.9)	81.54 (78.77 to 84.31)
No	1032 (24.1)	66.4 (61.24 to 71.56)
Insurance status		
Yes	2179 (62.2)	83.44 (80.71 to 86.16)
No	1287 (37.8)	68.78 (64.73 to 72.82)
Know HIV status		
No	1214 (35.3)	68.16 (64.13, 72.19)
Yes	2105 (64.7)	85.08 (82.32, 87.84)
Number of SP doses		
0–1	684 (20.6)	72.65 (68.1 to 77.19)
≥ 2	2677 (79.4)	81.31 (78.73 to 83.9)

Factors associated with institutional delivery

The multivariable logistic regression analysis showed that household wealth, place of residence, attended antenatal care, parity, health insurance status and knowing one's HIV status were associated with institutional delivery. Women in high-income households had 2.13 times the odds of delivering at a health facility compared with women in poor households. Women living in rural areas had 57% lower odds of delivering at a health facility compared with women living in urban areas (adjusted odds ratio [aOR] 0.43 [95% CI 0.27 to 0.67]). Women who attended antenatal care at least four times had 137% higher odds of delivering in a health facility compared with those who had antenatal care

attendance three times or less (aOR 2.37 [95% CI 1.54 to 3.65]). Multiparous women had 41% lower odds of institutional delivery compared with primiparous women (aOR 0.59 [95% CI 0.41 to 0.85]) (Table 2).

Also, women who did not have health insurance had 43% lower odds of delivering at a health facility compared with women who had health insurance (aOR 0.57 [95% CI 0.44 to 0.74]). Women who knew their HIV status had 41% higher odds of delivering at a health facility compared with those who did not know their HIV status (aOR 1.41 [95% CI 1.08 to 1.84]). However, age, marital status, education, access to media and number of SP doses were not associated with institutional delivery (Table 2).

Table 2. Factors associated with institutional delivery

Variables	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age (years)		
15–24	1	1
25–34	1.05 (0.78 to 1.40)	1.07 (0.75 to 1.53)
35–49	1.00 (0.74 to 1.36)	1.31 (0.90 to 1.89)
Marital status		
Never married	1	1
Married/cohabitation	1.07 (0.77 to 1.49)	1.17 (0.76 to 1.80)
Education		
No formal education	1	1
Primary	1.31 (0.95 to 1.80)	1.06 (0.73 to 1.54)
Secondary or higher education	2.86 (2.12 to 3.88)	1.40 (0.98 to 2.02)
Household wealth		
Poor	1	1
Middle income	1.63 (1.18 to 2.25)	1.18 (0.85 to 1.63)
High income	5.34 (3.66 to 7.81)	2.13 (1.36 to 3.35)*
Place of residence		
Urban	1	1
Rural	0.25 (0.17 to 0.37)	0.43 (0.27 to 0.67)*
Attended ANC		
0–3	1	1
≥4	4.85 (3.62 to 6.50)	2.37 (1.54 to 3.65)*
Parity		
Primiparous	1	1
Multiparous	0.58 (0.43 to 0.77)	0.59 (0.41 to 0.85)*
Access to media		
Yes	1	1
No	0.45 (0.34 to 0.59)	0.88 (0.66 to 1.17)
Insurance status		
Yes	1	1
No	0.44 (0.35 to 0.55)	0.57 (0.44 to 0.74)*
Know HIV status		
No	1	1
Yes	2.66 (2.05 to 3.46)	1.41 (1.08 to 1.84)*
Number of SP doses		
0–1	1	1
≥ 2	1.64 (1.28 to 2.10)	1.19 (0.89 to 1.60)

*p-Value <0.05.

1: reference category.

Discussion

Our study sought to investigate the prevalence of institutional delivery and associated factors in Ghana. We found that 77.89% of women in our study had delivered in a health facility. Factors such as high-income households, at least four ANC visits and knowing one's HIV status were positively associated with institutional delivery. Living in rural areas, no health insurance and multiparity were negatively associated with institutional delivery. Our study revealed that, age, marital status, education, access to media and number of SP doses were not associated with institutional delivery.

Our study found a high proportion of mothers in Ghana delivered at a health facility. This is consistent with other previous studies indicating that three of four mothers in Ghana delivered at a health facility.^{3,16} Our finding of increased utilization of institutional delivery could be attributed to the various policies rolled out by the government of Ghana and its health partners to improve maternal health. These policies include the exemption of pregnant women from delivery fees in public health facilities since 2003³¹ and implementation of the free maternal healthcare policy under the national health insurance scheme in 2008.²³ These implemented policies introduced women to a wide range of comprehensive healthcare services, including free delivery, thereby

increasing the number of institutional delivery in the country.^{16,32-35} Our findings are in contrast with studies in other LMICs such as Ethiopia, Guinea-Bissau, Nigeria, Tanzania and Angola, where the utilization of institutional delivery was lower.^{10,13,36-38}

In this study, women in high-income households were more likely to give birth at a health facility compared with those in poor households. Wealth has been associated with institutional deliveries in many LMICs.^{12,14,19,20,26} Recent studies in Ghana found the odds of institutional delivery were higher among women from rich households compared with those from poor households.^{28-30,39} In spite of the free maternal care services, our finding is likely due to the cost of transportation, distance to health facilities and differences in education level that exist among women from high-income and poor households and other informal costs associated with accessing institutional delivery care in Ghana.^{40,41} Our study also found a positive association between living in an urban setting and institutional delivery. This finding is corroborated by previous studies in Ghana.^{15,16,28,29} Women in rural settings are less likely to utilize institutional delivery, and this may be due to the inequitable distribution of health facilities, with more health facilities located in urban areas compared with rural areas. This makes it easier for women in urban areas to utilize health facility delivery compared with women in rural areas who are largely deprived of such facilities. Poor road networks in rural areas may also be contributing to less utilization of institutional delivery services.^{28,41}

We also found that mothers with at least four ANC visits during pregnancy were more likely to give birth at a health facility compared with those who had less than four ANC visits. ANC provides an opportunity for mothers to be informed on birth preparedness and complications. It is also an opportune time to promote the benefits of health facility delivery. These factors may likely influence their decision to opt for institutional delivery. Similar findings have been reported in other studies in Ghana.^{11,30,42} In contrast, having fewer ANC visits during pregnancy means less contact with healthcare providers and this may lead to inadequate knowledge on the importance of institutional delivery and may lead to home delivery.

Our study revealed that multiparous women had lower odds of giving birth at a health facility compared with primiparous women. Our study was consistent with findings of Adu et al.¹⁶ and Boah et al.¹¹ in Ghana, who argued that women delivering for the first time do not have experience with childbirth, may lack self-confidence and may also anticipate birth complications. This may compel them to give birth at a health facility. However, women with multiple deliveries have had some experience with childbirth and this may influence their decision not to utilize health facility delivery, particularly if the woman has never encountered any birth complications. Multiparous women may also give birth at home if they had a previous poor experience with a health facility delivery.⁴³ Our findings agree with other studies in LMICs, including Ghana.^{18,20,29}

We also observed that women who had health insurance were more likely to deliver at a health facility compared with women without health insurance. This could be attributed to the role health insurance plays in removing most of the financial barriers that prevent women from accessing essential health services. Our finding is supported by previous studies that found a higher odds of delivering at a health facility among women with

health insurance compared with women without health insurance in Ghana.^{29,33,42} However, an analysis of the 2014 Ghana Demographic and Health Survey by Yaya et al.⁴⁴ revealed that health insurance was not associated with institutional delivery. The lack of an association in the study by Yaya et al.⁴⁴ was likely due to chance, as the observed association between health insurance and health facility delivery in their study was not statistically significant.

One of the key findings of our study is the positive association between knowledge of HIV status and utilization of institutional delivery. We found that mothers who knew their HIV status were more likely to deliver at a health facility compared with those who did not know their HIV status. Knowing one's HIV status, particularly positive status, will likely prompt the individual to take all the necessary actions to deliver at a health facility to limit the possibility of vertical transmission.

Our study had strengths and limitations. The major strength of this study is the use of nationally representative data that allows for our findings to be generalized to the entire country. In this study, although our primary outcome was self-reported, we do not expect any recall bias on our primary outcome, as we expect women to be able to recall the place of delivery of their child. Our findings cannot be interpreted causally, as this was a cross-sectional study.

Conclusions

Women in wealthy households, residing in urban areas, attending ANC for at least four visits, primiparous, with health insurance and aware of their HIV status were positively associated with institutional delivery. At a policy level, we recommend that pregnant women be educated on the importance of delivering at a health facility, particularly those in rural settings. There is the need for a National Health Insurance Scheme to increase health insurance enrolment in rural areas through regular outreach services.

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Ethics approval: Not required.

Data availability: MICS data are publicly available at <https://mics.unicef.org/surveys>.

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