Published in final edited form as:

Matern Child Health J. 2016 March ; 20(3): 534–541. doi:10.1007/s10995-015-1851-6.

The Association between Health Insurance Coverage and Skilled Birth Attendance in Ghana: A National Study

Shane M. Khan^{1,2} and Kavita Singh^{1,3}

¹Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC

²Data and Analytics Section, Division of Data, Research and Policy, United Nations Children's Fund (UNICEF), Three United Nations Plaza, New York, NY

³Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC

Abstract

Skilled birth attendance (SBA) is a key health intervention used by roughly two-thirds of women in Ghana. The National Health Insurance Scheme (NHIS) provided by the Government of Ghana is widely expected to improve maternal health outcomes by removing financial barriers to health services. Using data from the 2011 national Ghana Multiple Indicator Cluster Survey implemented by the Ghana Statistical Services and UNICEF, we examine the effect of insurance on SBA using a multivariate logistic model, controlling for a number of enabling and predisposing factors and past experience with the health system. Our sample is 2 528 women who had a birth in the two years before the survey. Our results show that women with health insurance are 74% more likely to use SBA than women without health insurance. Results also underscore that health insurance, while it eliminates a monetary barrier, does not solve health services availability problems and widespread geographic disparities in coverage of SBA persist. Additionally, we find that higher parity women and poor women are much less likely to use SBA and should be the focus of health interventions in order to fulfil development goals. Health insurance may indeed be a useful mechanism to improve coverage of SBA though further work to understand the effect of health insurance on other maternal outcomes is warranted.

Keywords

health insurance; skilled delivery; Ghana; antenatal care; continuum of care

Introduction

Skilled birth attendants (SBA) are defined by the World Health Organization (WHO) as accredited professionals (such as doctors, midwives and nurses) who are educated and trained with skills to manage uncomplicated pregnancies, childbirth and the immediate postpartum period, and who are able to identify, manage and refer for maternal and newborn

complications [1]. The WHO recommends that skilled birth should be used throughout the continuum of care for women, covering pregnancy, birth and postpartum care and that the use of SBAs has a clinical rationale; SBAs, in conjunction with appropriate referrals and a functioning health system, can be used to prevent the majority of maternal deaths which are caused by direct obstetric complications (such as sepsis, hemorrhage, eclampsia, obstructed labor and unsafe abortion) [2] and also indirect causes such as HIV and malaria. Global analysis reveals that rates of neonatal mortality are highest in countries with the lowest levels of SBA coverage [3] and a separate multi-country study documents that SBA is associated with lower rates of neonatal deaths in Latin America and the Caribbean though the effect was not protective in Africa and Asia [4]. A recent meta-analysis reveals that SBA is associated with a 23 percent reduction in still births [5].

In Ghana, skilled birth as an intervention is particularly important given that a number of key maternal and newborn indicators are not optimum. Neonatal mortality rates are high (approximately 30 deaths per 1000 live births) [6], while the 2010 estimate of maternal mortality ratio is 350 deaths per 100 000 live births [7]. While SBA in Ghana has increased from 44 percent in 1993 to 68 percent in 2011 [8], the overall rate of increase is slow. While certain other indicators show good coverage, use of services is not uniform across the population and universal coverage of many interventions is not yet a reality in Ghana. In an equity analysis, Zere et al. shows that many maternal health interventions are not equitably distributed; the use of SBA, deliveries in a health facility, caesarian section, modern contraceptives and intermittent preventative treatment for malaria are used more by women in wealthier households [9]. Such uneven use of services threatens the achievement of key development goals such as the Millennium Development Goals [10] (MDGs), especially MDG 5 which seeks to improve maternal health.

People can access health services by paying user fees, one of the most used strategies to finance the health system [11]. However, this is not necessarily an equitable solution as the poor are less able to pay for services than the rich [12–13] and many who seek treatment and pay user fees can undergo heavy financial burden [14–16]. Indeed, the poor may instead choose to forgo health services rather than subject themselves to high health expenditures [17]. In different regions in Ghana, the user fees strategy in the past generated revenue that supported service delivery but was inequitable and unaffordable to the poor [18–20]. Another strategy that can promote universal health coverage is the use health insurance which essentially pools financial resources across a population such that as the pool increases in size, the financial burden on any individual is lowered [21]. To promote universal health coverage, the government of Ghana enacted the National Health Insurance Scheme (NHIS) in 2003 as a key part of the national poverty reduction scheme. The scheme became fully operational in late 2005. The NHIS requires universal registration for Ghanaians though no penalties for non-enrollment are enacted. Premiums are charged based on income though many district level mutual health insurance schemes charge a flat fee. The elderly (over 70), children (under age 18) with two enrolled parents and pregnant women are exempt from paying NHIS premiums [22].

Several studies at the national, district and regional levels thus far have examined the experiences of the women using the NHIS in Ghana. These studies find that NHIS

enrollment lacks equity and is higher among the rich than the poor [23–25]. The NHIS also demonstrates bias in renewals of health insurance where the urban are more likely to renew [26]. These issues of differential enrollment have also had effects on health outcomes. A study in the Metropolitan Accra area points out that the use of NHIS is associated with greater use of health care, such as having a hospital visit or hospital stay in the previous year and to seek formal care when sick [22]. A national-level study finds that antenatal care (ANC) visits are positively associated with NHIS enrollment, though NHIS does not affect the timing of the first visit [27]. Household members with NHIS are also less likely to sleep under self-treated mosquito nets [28]. Finally, a study in the North and Central regions of Ghana shows that insurance coverage during pregnancy is associated with increased facility delivery but not antenatal care [29].

The aim of this paper is to examine the association of health insurance in Ghana on skilled birth attendance. Our study has several advantages over previous analyses. Unlike the majority of studies on NHIS enrollment and effects on service utilization which covered selected districts and regions in Ghana, our study is national in scope. We further contribute to the literature by examining the association between NHIS and a health outcome several years after the NHIS has been implemented, in contrast to the only other similar national study which captured associations over the relatively short term of NHIS implementation [27].

Data

Data are from the 2011 Ghana Multiple Indicator Cluster Survey (MICS) supported by the Ghana Statistical Service and UNICEF. MICS surveys collect data from nationally-representative probability samples of households [30]. Households are selected using a two-stage, stratified probability design. For the purposes of the MICS survey, Ghana is divided into 20 sampling domains, within which, census enumeration areas are selected in the first stage using systematic probability proportional to size. In the second stage, households within the selected enumeration areas are selected using systematic sampling. Within households, all women of ages 15–49 were interviewed. The sample used for analysis is women with a birth in the 2 years before the survey as only this subset of women is asked questions on maternal health such as SBA.

The outcome variable, SBA, is a binary variable, labeled as ‘1’ if the women delivered the last live birth in the two years preceding the survey with a skilled attendant and ‘0’ if she did not. In Ghana, a skilled attendant is a medical doctor, nurse/midwife or auxiliary midwife. This information was obtained in the MICS by asking women age 15–49 who had a live birth in the 2 years preceding two years, “Who assisted with the delivery of (name)?” The Ghana MICS survey collected data on health insurance enrollment for women. Women were first asked if they ever registered for health insurance and then the type of health insurance they have. The NHIS accounted for nearly 99% of all enrollment and thus, we group NHIS and other kinds of insurance into one category and a second category for women who were not enrolled.

The analysis also includes a number of statistical controls grouped as enabling characteristics, predisposing characteristics, or prior experience with the health system, based on the Andersen Behavioral model of access to medical care, Phase 4 Emerging model (1993) [31]. These variables are shown in the tables. Household wealth is based on an index of household goods and services, developed using principal component analysis [32]. Households are categorized into five categories, from poorest to richest quintiles to which women are assigned. Region refers to the geographic region where the woman lived and area refers to if the area was urban or rural. “Wantedness” of the child refers to if the child, at the time of pregnancy, was wanted then, later or not at all. We also include mother’s age at birth (presented in 4 categories), the level of education the woman completed and the ethnicity and religion of the household head as ethnicity and religion of the woman herself was not collected. Currently married refers to if the woman was married or cohabiting at the time of the survey. Parity refers to the number of children ever born. Antenatal care refers to checks that the woman received during the last pregnancy for the last child born in the last 2 years. The ownership of an immunization card refers to the woman having an immunization card for herself. Tetanus coverage refers to having 2 or more doses of tetanus during the pregnancy for the last live birth in the 2 years before the survey. As the outcome variable is a binary, a logistic regression model is used to estimate the effect of the main variables on the outcome, controlling for other factors. As the sample is not self-weighting, we apply sample weights for analysis. We also use the `-svy` command in STATA to account for the complex sampling design used in this sample. As a check on the model specification, we also used the link test, which indicated no additional higher level and interaction terms are needed.

Results

Table 1 shows the characteristics of women in the study. About three quarters of women have health insurance (73%). The majority of the sample is rural (58%) and slightly more than half of the sample (57%) wanted their last birth at that time. About half of births (50%) took place when women were 25-34 years of age. Approximately 29% of women had no education, though close to 49% had completed greater than primary school. The largest ethnic and religious groups were the Akan (42%) and Christian (66%) respectively. The vast majority of women are married (90%) and more than 70% of the sample had 4 children or less. Overall, the sample of women had good contact with the health care system; about 87% of women had four or more antenatal care visits for their last birth, 90% had an immunization card and 55% were immunized against tetanus during pregnancy for their last birth.

In Ghana, 68 percent of women used a skilled attendant at their last birth (Table 2). At the bivariate level, health insurance is significantly associated with higher use of skilled birth attendance. Results show that women with health insurance are more likely to use SBA than women without health insurance (health insurance: 73% vs. no health insurance: 56%, *p*-value: 0.000). Use of SBA and wealth are positively associated, with nearly all women in the richest quintile using SBA while less than 40% of women in the lowest quintile using SBA. Table 2 also shows that women in urban areas and Greater Accra were more likely to use SBA than women in rural areas and other geographic regions of Ghana. Additionally, higher parity women were less likely to use SBA compared with lower parity women. The Akan

ethnic group and Christians were also more likely to use SBA than other ethnic and religious groups. Women who had previous contact with the health system (ANC use, immunization card and tetanus coverage) were also significantly more likely to use SBA at the bivariate level.

Table 3 shows the results of a logistic regression where SBA is the outcome. Results show that having health insurance, after controlling for other factors, is significantly associated with use of SBA. NHIS increases the odds of SBA use by 47% (OR: 1.47, p-value 0.017). Household wealth status, which is significant at the bivariate level, remains a significant in the logistic regression. Higher quintiles show progressively greater use of SBA compared with the poorest quintile. We also investigated if health insurance moderates the effect of wealth on SBA through the use of an interaction term (not shown). However, the interaction term was not significant and was not included in the final model.

A number of other controls that were significant at the bivariate level remained significant in the multivariate model. For example, rural women are significantly less likely to use SBA than urban women (OR: 0.36, p-value 0.000). Education shows a dose response relationship to use of SBA in the model; the odds of using SBA increases as educational level increases. For example, women with primary education were 68% more likely to use SBA than women with no education (p-value 0.006) while women with middle school or junior secondary were more than two times more likely to use SBA (OR: 2.20, p-value 0.000) and women with secondary or greater education were more than three times more likely to use SBA compared to women with no education (OR: 3.33, p-value: 0.001). Higher parity women were significantly less likely to use SBA compared with lower parity women. Finally, contact with the health care system through ANC or tetanus coverage are associated with significantly higher odds of using SBA, though having an immunization card for women themselves was not significantly associated with use of SBA (see table 3) in the multivariate model.

Discussion

The use of skilled birth attendants is an important health intervention. In Ghana, the use of SBA is relatively low compared to a number of other countries in the developing world. Our paper provides evidence that use of SBA may be improved through the use of a national health insurance scheme and that such a strategy may contribute to the achievement of development goals such as the MDGs. Our study is also one of the few studies to examine the NHIS on a health outcome (SBA) at the national level and similar to other studies, we find that the NHIS is positively associated with the outcome. We note that enrollment in NHIS is relatively low, despite the financial exemption made for pregnant women. While our current analysis cannot address the reasons for non-enrollment, other analysis shows that convenience and perceived benefits of health insurance can sway women to enroll in the NHIS within certain regions of Ghana [33]. Other qualitative data point out that poverty and “uncertainties” around being referred to facilities (transport, costs, dealing with a new facility) as barriers to facility care [29]. Further work to understand the non-enrollment of women in the NHIS can be undertaken to broaden the evidence base on this area.

Our results also underscore a number of other important findings chief among these is that health insurance is not a panacea for under-utilization of maternal health services. The underlying mechanism of health insurance is the removal of financial barriers (such as user fees) to health care. However, health insurance does not change the geographic availability of health services. In Ghana, health service and health staff availability vary widely across the different regions of the country [34] and unsurprisingly, after controlling for insurance status, rural women still use SBA less than urban women.

Another finding of note is that women who accessed pregnancy care are more likely to use skilled attendance, which is consistent with other studies on ANC, for example [35, 36] This may suggest that having tetanus immunization or antenatal care can be used to improve SBA uptake. Further work should be done to understand if during these services SBA is already actively promoted or if the underlying mechanism of the noted association is through developing the habit of using formal health services or increasing women's maternal knowledge as noted in the literature [37]. These findings also suggest that ANC visits and tetanus immunization are key links to later skilled delivery which underscores the utility of using the continuum of care approach and package of interventions for improving maternal outcomes [38]. We also note that nearly all women have been to ANC at least once [30] and close to 9 out of 10 have had at least four ANC visits though SBA use is much lower suggesting that the barriers to SBA are different to those of ANC. A sub-national study in Ghana points out that ANC visits incur less indirect costs as women can usually walk to ANC visits though this is not possible immediately before birth [29], while other studies in Nepal and rural Kenya show that distance and accessibility to a facility for maternity care are key barriers to SBA use [39–40]. The disparity between ANC use and SBA use also may indicate the need to implement or strengthen counseling on birth preparedness plans for pregnant women which addresses the “three delays” for maternal care. Recognizing the gap in ANC and SBA and the use of birth preparedness plans is especially important as other evidence shows that birth preparedness plans are associated with greater use of SBA [41].

It is also interesting to note that higher parity women are less likely to use SBA than lower parity women. This parity effect has also been noted in other studies such as in Cambodia and India [42–43]. These women are probably older and may rely more on traditional practices. Specific interventions may be needed to educate them on the benefits of skilled delivery. Results from studies on ANC point out that in Zimbabwe [44], older women lack some concern related to getting ANC, a problem than we think can potentially spill over into the delivery phase. While the risk of higher parity on negative health complications remains controversial, we propose that programs can and should target higher parity women to increase SBA as a matter of fulfilling development goals such as MDG 5 [45].

It should be kept in mind that our statistical model may be biased to some extent. Several known covariates of SBA were not collected in the survey. For instance, location and distance to health facilities are known barriers to service utilization. This may explain why richer women who often live in urban areas with greater numbers of health facilities are still more likely to use SBA than poorer women even after controlling for insurance status. The information provided by the MICS is particularly useful for this analysis though it would be good to have further information on when women enroll in the NHIS. Such timing

information would be useful in examining enrollment behaviors such as initiation of enrollment and retention of NHIS among different population groups such as pregnant women and also to establish if insurance enrollment occurred prior to specific outcomes such as the birth of a child, a limitation that we nor the only other national study on NHIS and maternal outcomes could overcome [27]. This analysis is also decidedly demand oriented and it should be kept in mind that supply-side solutions such as increasing the number of skilled attendants can also improve SBA coverage. This is especially important in developing countries where lack of human resources and retention of trained staff are major identified barriers to improving maternal health [46]. Poor service delivery such as maltreatment during delivery is another potential barrier that is identified in qualitative research and for which we cannot control for [47].

There are relatively few studies on the effects of national insurance schemes on health outcomes in Ghana, and few of these are national like this one. Through this analysis, we provide empirical evidence that women used SBA more when insured with the NHIS than women who are uninsured. Programmatically, our findings document that women who are poor, or live in rural areas and higher parity women should be targeted to improve the coverage of SBA. Further work on other maternal and child outcomes is warranted to better understand the population effects of NHIS.

References

1. World Health Organization. Making pregnancy safer: The critical role of the skilled attendant: A joint statement by WHO, ICM and FIGO. Geneva: World Health Organization; 2004.
2. de Bernis L, Sherratt DR, AbouZahr C, Van Lerberghe W. Skilled attendants for pregnancy, childbirth and postnatal care. *British Medical Bulletin*. 2003; 67:39–57. [PubMed: 14711753]
3. Lawn JE, Cousens S, Zupan J. 4 million neonatal deaths: When? where? why? *Lancet*. 2005; 365(9462):891–900. [PubMed: 15752534]
4. Singh K, Brodish P, Suchindran C. A regional multilevel analysis: Can skilled birth attendants uniformly decrease neonatal mortality? *Maternal and Child Health Journal*. 2014; 18(1):242–249. [PubMed: 23504132]
5. Yakoob MY, Ali MA, Ali MU, et al. The effect of providing skilled birth attendance and emergency obstetric care in preventing stillbirths. *BMC Public Health*. 2011; 11(Suppl 3) S7-2458-11-S3-S7.
6. UN Inter-agency Group for Child Mortality Estimation (IGME). Child mortality estimates CME info: Ghana. 2014. http://www.childmortality.org/index.php?r=site/graph#ID=GHA_Ghana. Accessed August 2014
7. UN Maternal Mortality Estimation Inter-agency Group (MMEIG). Maternal mortality estimates: Ghana. 2013. http://www.maternalmortalitydata.org/inner.html?country_selection=O. Accessed August 2014
8. UN Statistics Division. Millennium Development Indicators: Births attended by skilled personnel, percentage: Ghana. 2015. <http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=570&crd=288>. Accessed July 2015
9. Zere E, Kirigia JM, Duale S, Akazili J. Inequities in maternal and child health outcomes and interventions in Ghana. *BMC Public Health*. 2012; 12(1):252.doi: 10.1186/1471-2458-12-252 [PubMed: 22463465]
10. Vandemoortele, M. The MDG fundamentals: Improving equity for development. London: Overseas Development Institute; 2010. Briefing paper no. 59
11. Xu, K., Saksena, P., Jowett, M., et al. World Health Report. Geneva: World Health Organization; 2010. Exploring the thresholds of health expenditure for protection against financial risk; p. 328-333.

12. Xu K, Evans DB, Kawabata K, et al. Household catastrophic health expenditure: A multicountry analysis. *Lancet*. 2003; 362(9378):111–117. [PubMed: 12867110]
13. Wagstaff A. Poverty and health sector inequalities. *Bulletin of the World Health Organization*. 2002; 80(2):97–105. [PubMed: 11953787]
14. Su TT, Kouyaté B, Flessa S. Catastrophic household expenditure for health care in a low-income society: A study from Nouna district, Burkina Faso. *Bulletin of the World Health Organization*. 2006; 84(1):21–27. [PubMed: 16501711]
15. Wagstaff A. The economic consequences of health shocks: Evidence from Vietnam. *Journal of Health Economics*. 2007; 26(1):82–100. [PubMed: 16905205]
16. Van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. Catastrophic payments for health care in Asia. *Health Economics*. 2007; 16(11):1159–1184. [PubMed: 17311356]
17. Gilson L. The lessons of user fee experience in Africa. *Health Policy and Planning*. 1997; 12(4): 273–285. [PubMed: 10176263]
18. Nyonator F, Kutzin J. Health for some? the effects of user fees in the Volta region of Ghana. *Health Policy and Planning*. 1999; 14(4):329–341. [PubMed: 10787649]
19. Waddington C, Enyimayew K. A price to pay, part 2: The impact of user charges in the Volta region of Ghana. *The International Journal of Health Planning and Management*. 1990; 5(4):287–312.
20. Waddington CJ, Enyimayew K. A price to pay: The impact of user charges in Ashanti-Akim district, Ghana. *The International Journal of Health Planning and Management*. 1989; 4(1):17–47.
21. World Health Organization. *The World Health Report: Health systems financing: The path to universal coverage*. Geneva: World Health Organization; 2010.
22. Blanchet N, Fink G, Osei-Akoto I. The effect of Ghana's national health insurance scheme on health care utilisation. *Ghana Medical Journal*. 2012; 46(2):76–84. [PubMed: 22942455]
23. Jehu-Appiah C, Aryeetey G, Spaan E, et al. Equity aspects of the national health insurance scheme in Ghana: Who is enrolling, who is not and why? *Social Science and Medicine*. 2011; 72(2):157–165. [PubMed: 21145152]
24. Sarpong N, Loag W, Fobil J, et al. National health insurance coverage and socio-economic status in a rural district of Ghana. *Tropical Medicine and International Health*. 2010; 15(2):191–197. [PubMed: 19961565]
25. Dixon J, Tenkorang EY, Luginaah I. Ghana's national health insurance scheme: Helping the poor or leaving them behind? *Environment and Planning-Part C*. 2011; 29(6):1102.
26. Witter S, Garshong B. Something old or something new? Social health insurance in Ghana. *BMC International Health and Human Rights*. 2009; 9:20.doi: 10.1186/1472-698X-9-20 [PubMed: 19715583]
27. Dixon J, Tenkorang EY, Luginaah IN, et al. National health insurance scheme enrolment and antenatal care among women in Ghana: Is there any relationship? *Tropical Medicine and International Health*. 2014; 19(1):98–106. [PubMed: 24219504]
28. Yilma Z, van Kempen L, de Hoop T. A perverse 'net' effect? Health insurance and ex-ante moral hazard in Ghana. *Social Science and Medicine*. 2012; 75(1):138–147. [PubMed: 22507951]
29. Singh K, Osei-Akoto I, Otchere F, et al. Ghana's National Health insurance scheme and maternal and child health: a mixed methods study. *BMC Health Services Research*. 2015; 15(1):108. [PubMed: 25889725]
30. Ghana Statistical Service. *Ghana Multiple Indicator Cluster Survey with an enhanced malaria module and biomarker*. Accra Ghana Statistical Service. 2012
31. Andersen RM. Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*. 1995; 36(1):1–10. [PubMed: 7738325]
32. Rutstein, SO., Johnson, K. *The DHS wealth index*. Calverton, MD: ORC Macro; 2004. DHS comparative reports no. 6
33. Jehu-Appiah C, Aryeetey G, Agyepong, et al. Household perceptions and their implications for enrollment in the national health insurance scheme in Ghana. *Health Policy and Planning*. 2012; 27(3):222–233. DOI: 10.1093/heapol/czr032 [PubMed: 21504981]

34. Ghana Statistical Service (GSS), Health Research Unit, Ministry of Health, and ORC Macro. Ghana service provision assessment survey 2002. Accra: Ghana Statistical Service; 2003.
35. Stanton C, Blanc AK, Croft T, et al. Skilled care at birth in the developing world: progress to date and strategies for expanding coverage. *Journal of Biosocial Science*. 2007; 39:109–120. [PubMed: 16522226]
36. Adjikanou V, LeGrand T. Does antenatal care matter in the use of skilled birth attendance in rural Africa: A multi-country analysis. *Social Science and Medicine*. 2013; 86:26–34. [PubMed: 23608091]
37. Ensor T, Quigley P, Green C, et al. Knowledgeable antenatal care as a pathway to skilled delivery: Modelling the interactions between use of services and knowledge in Zambia. *Health Policy and Planning*. 2014; 29(5):580–588. DOI: 10.1093/heapol/czt044 [PubMed: 23894074]
38. Kerber KJ, de Graft-Johnson JE, Bhutta ZA, et al. Continuum of care for maternal, newborn, and child health: From slogan to service delivery. *Lancet*. 2007; 370(9595):1358–1369. [PubMed: 17933651]
39. Jahn A, Ilang M, Shah U, et al. Maternity care in rural Nepal: A health service analysis. *Tropical Medicine and International Health*. 2005; 5(9):657–665.
40. Hodgkin D. Household characteristics affecting where mothers deliver in rural Kenya. *Health Economics*. 1996; 5(4):333–340. [PubMed: 8880170]
41. Magoma M, Requejo J, Campbell O, et al. The effectiveness of birth plans in increasing use of skilled care at delivery and postnatal care in rural Tanzania: A cluster randomised trial. *Tropical Medicine and International Health*. 2013; 18(4):435–443. [PubMed: 23383733]
42. Yanagisawa S, Oum S, Wakai S. Determinants of skilled birth attendance in rural Cambodia. *Tropical Medicine and International Health*. 2006; 11(2):238–251. [PubMed: 16451349]
43. Hazarika I. Factors that determine the use of skilled care during delivery in India: Implications for achievement of MDG-5 targets. *Maternal and Child Health Journal*. 2011; 15(8):1381–1388. [PubMed: 20859759]
44. Mathole T, Lindmark G, Majoko F, Ahlberg BM. A Qualitative Study of Women's Perspectives of Antenatal Care in a Rural Area of Zimbabwe. *Midwifery*. 2004; 20(2):122–132. [PubMed: 15177855]
45. Aliyu MH, Jolly PE, Ehiri JE, et al. High parity and adverse birth outcomes: Exploring the maze. *Birth*. 2005; 32(1):45–59. [PubMed: 15725205]
46. Adegoke A, Van Den Broek N. Skilled birth attendance-lessons learnt. *BJOG: An International Journal of Obstetrics and Gynaecology*. 2009; 116(s1):33–40. [PubMed: 19740170]
47. Moyer C, Adongo P, Aborigo R, et al. 'They treat you like you are not a human being': Maltreatment during labour and delivery in rural northern Ghana. *Midwifery*. 2014; 30(2):262–268. [PubMed: 23790959]

Table 1

Characteristics of women who had a live birth in the 2 years preceding the survey, Ghana 2011

Characteristic		%
Enabling characteristics		
Has health insurance	Yes	73.1
	No	26.9
Household wealth	Poorest quintile	22.2
	Second quintile	21.6
	Middle quintile	19.8
	Fourth quintile	18.0
	Richest quintile	18.5
Region	Western	10.7
	Central	9.7
	Greater Accra	15.7
	Volta	7.5
	Eastern	11.4
	Asante	17.8
	Brong Ahafo	9.0
	Northern	11.2
	Upper East	4.2
	Upper West	3.0
Area	Urban	42.3
	Rural	57.8
Wantedness of child	Wanted then	56.7
	Later	31.9
	Not wanted	11.3
Predisposing characteristics		
Mother's age at birth	< 25	28.9
	25-34	50.4
	35-49	20.7
Education	None	29.0
	Primary	22.3
	Middle/JSS	35.0
	Secondary +	13.6
Ethnicity of household head	Akan	42.1
	Mole Dagbani	18.9
	Other	39.0
Religion of household head	Other	15.1
	Christian	65.5
	Muslim	19.4
Currently married	Yes	89.8
	No	10.2

Characteristic		%
Parity	1-2	39.9
	3-4	31.9
	5-6	17.4
	7+	10.8
Prior experience with health system		
Antenatal care for last birth [/]	Yes	86.6
	No	13.4
Has an immunization card	Yes	90.0
	No/DK	10.0
Received 2+ tetanus doses	Yes	54.6
	No	45.4
Total		2528

[/] Four or more visits to any provider

Table 2

Skilled assistance during delivery by various factors, among women with a birth in the two years preceding the survey, Ghana 2011

		Any skilled personnel	N	p-value
Enabling characteristics				
Has health insurance	Yes	73.0	1849	0.000
	No	55.8	680	
Household wealth	Poorest quintile	38.7	560	0.000
	Second quintile	57.3	547	
	Middle quintile	70.6	500	
	Fourth quintile	85.9	455	
	Richest quintile	97.6	467	
Region	Western	64.5	270	0.000
	Central	63.4	246	
	Greater Accra	89.7	397	
	Volta	64.4	189	
	Eastern	77.9	288	
	Asante	73.7	449	
	Brong Ahafo	63.7	227	
	Northern	37.3	283	
	Upper East	67.0	105	
Area	Upper West	60.4	75	
	Urban	88.2	1068	0.000
	Rural	53.9	1460	
Wantedness of child	Wanted then	68.7	1434	0.403
	Later	69.4	807	
	Not wanted	63.9	287	
Predisposing characteristics				
Mother's age at birth	< 25	69.1	731	0.005
	25-34	71.1	1274	
	35-49	60.7	524	
Education	None	44.1	733	0.000
	Primary	66.2	565	
	Middle/JSS	79.5	886	
Ethnicity of household head	Secondary +	95.3	344	
	Akan	76.7	1065	0.000
	Mole Dagbani	59.9	477	
Religion of household head	Other	63.5	987	
	Other	55.3	382	0.000
	Christian	73.5	1657	
Currently married	Muslim	61.3	490	
	Yes	67.8	2271	0.158

		Any skilled personnel	N	p-value
Parity	No	73.5	258	0.000
	1-2	80.0	1008	
	3-4	66.5	807	
	5-6	57.4	440	
	7+	48.8	273	
Prior experience with health system				
Antenatal care for last birth ^I	Yes	73.9	2190	0.000
	No	32.4	338	
Has an immunization card	Yes	70.3	2275	0.000
	No/DK	51.3	254	
Received 2+ tetanus doses	Yes	74.9	1381	0.000
	No	60.5	1147	
Total		68.4	2528	

[/] Four or more visits to any provider

Table 3

Adjusted odds of using skilled birth attendance from a multivariate logistic regression model, Ghana 2011

		OR	<i>p-value</i>
Enabling characteristics			
Has health insurance	Yes	1.47	0.017
	No	1.00	<i>ref</i>
Household wealth	Poorest quintile	1.00	<i>ref</i>
	Second quintile	1.58	0.028
	Middle quintile	1.75	0.014
	Fourth quintile	3.70	0.000
	Richest quintile	10.60	0.000
Region	Western	1.00	<i>ref</i>
	Central	0.54	0.062
	Greater Accra	1.04	0.916
	Volta	0.86	0.731
	Eastern	1.04	0.909
	Asante	0.87	0.666
	Brong Ahafo	0.94	0.840
	Northern	0.43	0.020
	Upper East	1.66	0.172
	Upper West	1.06	0.869
Area	Urban	1.00	<i>ref</i>
	Rural	0.36	0.000
Wantedness of child	Wanted then	1.00	<i>ref</i>
	Later	0.92	0.607
	Not wanted	0.80	0.374
Predisposing characteristics			
Mother's age at birth	Less than 20	1.00	<i>ref</i>
	20-34	1.28	0.250
	35-49	1.46	0.140
Education	None	1.00	<i>ref</i>
	Primary	1.68	0.006
	Middle/JSS	2.20	0.000
	Secondary +	3.33	0.001
Ethnicity of household head	Akan	1.00	<i>ref</i>
	Mole Dagbani	1.36	0.225
	Other	0.96	0.867
Religion of household head	Other	1.00	<i>ref</i>
	Christian	0.79	0.213
	Muslim	0.91	0.710
Currently married	Yes	1.03	0.905
	No	1.00	<i>ref</i>

		OR	<i>p-value</i>
Parity	0-1	1.00	<i>ref</i>
	2-3	0.52	0.001
	4-5	0.54	0.008
	6+	0.55	0.057
Prior experience with health system			
Antenatal care for last birth ^{<i>l</i>}	Yes	3.00	0.000
	No	1.00	<i>ref</i>
Has an immunization card	Yes	1.01	0.956
	No/DK	1.00	<i>ref</i>
Received 2+ tetanus doses	Yes	1.27	0.090
	No	1.00	<i>ref</i>
Total		2528	

^{*l*} Four or more visits to any provider