



THE INFLUENCE OF ANTENATAL CARE SYSTEM ON GHANAIAN WOMEN'S PREFERENCE OF PUBLIC OR PRIVATE DELIVERY FACILITY

Iyanda, A.E¹., Oppong, J.R²., and Omotoso, O³.

^{1&2} Department of Geography and the Environment, University of North Texas, Denton, Texas 76203, USA.

³ Department of Geography and Planning Science, Ekiti State University, Ado-Ekiti, Nigeria

¹aei11@txstate.edu

²Joseph.Oppong@unt.edu

³oluomotoso06@yahoo.com

ABSTRACT

Comprehensive antenatal care is important for reducing maternal mortality in developing countries. The quality of care received during antenatal visits determines subsequent use of maternal healthcare, particularly for delivery. However, the choice between a private and public health facility for delivery varies in ways that are not completely understood, but is hypothesized to be influenced by the experiences of women during antenatal care. This study explores the influence of type of antenatal care provider on the final place of delivery – public or private – in Ghana. We analyzed the 2014 Ghana demographic and health survey data using univariate and multilevel logistic regression. The odds of delivering in a public health facility increased significantly from 1.56 in the first model to 1.661 for women who received antenatal care from a nurse/midwife. In the second model, women who received antenatal care from a physician were significantly less likely to use a public facility for delivery, while those who received service from a community health officer were over than three times more likely to deliver in a public facility. In the final model, the odds ratio of a woman who received care from a physician delivering in a public facility increased but decreased for a Community Health Officer after adjusting for geographic location and socioeconomic status variables. Discussion of the findings is provided in the body of the paper.

Keywords: antenatal care, health providers, public-private facility delivery, NHIS, Ghana

1.0 INTRODUCTION

1.1 Background on Incidence of Maternal Morbidity and Mortality

High maternal mortality ratios (MMRs) are a big health challenge in developing countries. The World Health Organization (WHO) defines MMR as the ratio of the number of maternal deaths during a given period per 100,000 live births of the same period. MMR also describes the level of obstetric risk among women of reproductive age (Boerma, 1987). Between 1990 and 2015, 10.7 million women died because of maternal causes (Alkernal et al., 2015). Most of these deaths occurred in developing countries. Thus, the goal of reducing maternal mortality among vulnerable countries (vulnerable countries are countries identified with high rate of maternal death) remains a high priority (Boerma, 1987; Harvey, et al., 2007). Consequently, improving



maternal and children's health was one of the eight goals proposed by the United Nations in early 2000. Specifically, goal five of the millennium development (MDG-5) was to reduce the global MMR by 75% between 1990 and 2015. This target period has passed, but the MMR remains high in many developing countries (WHO, 2015). Focused antenatal care, skilled birth attendance, and postnatal care are some of the strategies proposed by the WHO and other international health agencies to reduce this global menace. Empirical evidence has demonstrated that the uptake of antenatal care by pregnant women has improved significantly among low and middle-income countries (LMIC), but not in developing countries that account for 99% of maternal deaths globally (Alkemal et al., 2015)

WHO recommends comprehensive antenatal care—defined as a focused antenatal care package from a trained health worker—in order to detect, prevent, and manage pregnancy-related risks during and after childbirth (Kumbani, Bjune, Chirwa and Odland, 2013). Focused antenatal care (ANC) and assistance from skilled health workers (SHWs) are important indicators for improved maternal outcomes. During antenatal care, women who are diagnosed with any sign of abnormality or obstetric risk are placed on medical watch and attend more than the prescribed number of ANC visits (Galle, Van-Parys, Roelens, and Keygnaert, 2015). Increasing the numbers of deliveries that take place under a SHW can also prevent many deaths from occurring at health facilities. Even though the number of maternal deaths that occur in health facilities in developing countries is high due to poor facility conditions, low quality of obstetric care, and delays in seeking early care (Boerma, 1987), professional delivery at a health facility is still preferred to off-facility delivery due to perceptions of lowered risk in a health facility (Asante-Sarpong, Owusu, Saravanan, Appiah and Abu, 2016).

One troubling question central to any maternal care utilization study is why access to health facility services, evidenced by a high usage of antenatal care services, does not equate with utilization of health facilities during delivery (Berhan and Berhan, 2014; Bloom, Lippeveld, Wypij, 1999). Facility deliveries occur in various categories of health facilities, from missionary to government-owned hospitals, thus, access and utilization depend mostly on availability, distance, and costs.

Problem Statement

In Ghana, between 2005 and the end of 2008, over 90% of women received antenatal care from a health professional—a physician, nurse, midwife, or community health officer (CHO) and at least 99% received antenatal care from a health professional for their first delivery (Arhinful, 2009). Although, the National Health Insurance Scheme (NHIS)—which strives to cut the out-of-pocket expenditure for maternal healthcare through the universal healthcare system—has contributed to increased antenatal care by making health-facility delivery accessible for all pregnant women (Amo-Adjei, Anku, Amo, and Effah, 2016), disparity in usage still exists. Presumably, accessibility should increase when medical care expenses are subsidized (Andersen and Newman, 2005). Although evidence from an NHIS evaluation did demonstrate improved access to health facilities, utilization is still limited for many Ghanaian citizens including pregnant women, who are supposed to use maternal services for free (Asante-Sarpong, et al., 2016). Not enough evidence is available to show why Ghanaian women of reproductive age discontinue service after antenatal care or choose to use another type of facility for delivery.



Furthermore, the experience of a woman during antenatal visits could be a significant factor in determining if she delivers in a health facility or elsewhere. Many studies have documented that women's perceptions of the quality of care received could hamper continuous use of healthcare (Bloom, et al., 1999; d'Ambruoso, Abbey, and Hussein, 2005; Galle et al, 2015; Oikawa et al. 2014; Van Eijk et al., 2006). For example, d'Ambruoso, et al. (2005) showed that staff attitude was a critical factor influencing maternal care in Ghana. Similarly, a rural Southern Malawi study found that lack of patient satisfaction and the poor attitude of health workers during ANC visits were among the reasons for off-facility deliveries (Kumbani, et al., 2013). Overall women's perception of maternal health care and experience are critical elements in choice of health care facility for delivery.

Many studies in Africa indicate that while women were satisfied with care in a health facility because of its professionalism, many were not happy with the attitudes of healthcare workers and delays they experienced in receiving care (Wambua, Mbayaki, Munyao et al., 2015); all these factors are termed as quality of care. Empirical evidence indicates that variations in patient satisfaction with different categories of health facilities for continuous maternal healthcare is currently underexplored in many African studies (Dansereau et al., 2015; Oikawa et al., 2014). As a result, this study is designed to answer two research questions.

- 1.) How do antenatal care services rendered by any of the three types of SHWs—physician, nurse/midwife, and/or CHO influence decision on the choice between a private or public facility delivery under Ghana's free maternal care policy?
- 2.) To what extent do place of residence, health insurance policy, and socioeconomic factors influence the decision to deliver in a public or private health facility among Ghanaian women?

The multi-model approach this study adopts will help health planners, health ministries, and international health organizations to understand separate effects of facility factor, specifically how services rendered by the individual category of SHWs, location factor (urban-rural residence), and socioeconomic factors in choice of public and private delivery in Ghana.

2.0 RESEARCH METHODOLOGY

2.1 Data Source

This study analyzed the Ghana Demographic and Health Survey (GDHS) version 6. The data contained information on maternal and marital status, antenatal care, health care provider, socioeconomic status, health insurance coverage, sources of health care, and place of residence.

2.2 Variables Explained

The outcome variable measured in this study is delivery in a health facility, calculated as total place of delivery, minus (-) home delivery.

$$F_{DEL} = Z_{T.POD} - H_{DEL}$$

Where *Z* is total delivery; *F* is delivery in health facilities (public and private); *H* is home delivery.



Delivery in a health facility was recoded as Public or Private while delivery that took place at home was coded as user-missing, and therefore was excluded from the analysis. The public health facility category includes all government-financed hospitals, health care centers, and maternity and community-based health posts, and was coded as “2”. The private health facility category, coded as “1,” consists of all other hospitals privately owned by missionaries or faith-based groups and other private-for-profit hospitals, clinics, and maternity centers.

Our independent variable was antenatal care from a skilled health worker (physician, nurse-midwife, or community health officer). We used antenatal care delivery by a SHW to measure quality of service and its effect on choice of place of delivery. According to the DHS report, the highest cadre from the three levels was recorded for each respondent in the survey. However, our principal independent variable was antenatal service offered by a nurse-midwife because, as the statistics in Table 1 show, this is the type of health worker widely available for maternal care in Ghana. Other determinants of health-seeking behavior were identified: women’s age, educational level, marital status, parity, wealth index, region of residence, rural-urban residence, religious affiliations, and health insurance coverage as expressed in Anderson and Newman’s healthcare utilization models and in the literature. Furthermore, some variables were recoded for easy analysis and interpretation. For example, “total number of children born by women” was categorized as *primiparous-1*, *multiparous-2*, or ≥ 3 births as *grand-multiparous*. Women with no children were excluded from the classification and recoded as *user-missing*. Previous research shows that parity and sociodemographic traits of women, particularly education and women’s age, affect health care utilization. Ethnic groups were recoded to 1= Akan, 2= Ga/Dangme, and 3 = others. Payment for drugs and other services in the health facility was classified as out-of-pocket 1= yes, 0 = no out-of-pocket payment. Also, wealth variable was recoded to 1= poor, 2= middle and 3= nonpoor for the multilevel logistic regression. Not all the variables used in the univariate analysis were used in the multivariate analysis due to statistical redundancy.

Table 1: Statistics for place of delivery and antenatal care by SHW

	Antenatal Care service by:		
	Physician	CHO	Nurse/midwife
Mean	0.17	0.12	0.81
SD	0.377	0.32	0.39
N	(4294)	(4294)	(4294)

Calculated from GDHS, 2014

2.3 Analysis Techniques

The Statistical Package for Social Science software (SPSS v.20) was used for the analysis of the DHS data. Descriptive and multivariate analyses (Chi-square and multiple logistic regression) were carried out to assess the degree of association and to determine the predictors of type of health facility delivery. Variables were introduced in the regression model systematically. Thus, three models, classified as partial, intermediate, and full were generated from the logistic regression. Private facility was the reference category (RC) variable for the dependent variable in the model. First, in the partial model only antenatal care from a nurse/midwife was entered to predict the decision to deliver in either a private or public facility setting. This was to assess the



influence of a nurse/midwife service on the decision of a private or public facility delivery. In the second (intermediate) model, we introduced service(s) by the three types of health care providers. Lastly, in the full model, we introduced NHIS coverage, out-of-pocket, parity, place of residence, and other socioeconomic variables that can influence respondents' choice of a formal health facility delivery. Model fitness was based on Hosmer and Lemeshow (H-L) statistics, which is a Pearson statistic with an expected significant level above 0.05. A significant H-L statistic with p-value < 0.05 indicates an unfit model (Peng, Lee and Ingersoll, 2002). The value of H-L was non-significant, p = 0.467.

3.0 RESULTS AND DISCUSSION

3.1 Bivariate Analysis of Decision to Deliver in a Health Facility

Result of bivariate analysis is presented in Table 2 and it shows a significant relationship between facility delivery and antenatal care service offered by the three categories of SHW. There is a significant difference in choice of place of delivery among women who received ANC from a physician ($\chi^2(1) = 54.9, p < 0.001$), nurse-midwife ($\chi^2(1) = 6.5, p < 0.05$), and or CHO ($\chi^2(1) = 10.6, p < 0.05$). Women's preferences for delivering their babies in a private versus public facility depends on the person who provided their ANC services. Women who received ANC from a physician were more likely to deliver in a public facility while women who received ANC from a nurse/midwife or CHOs usually used a private facility (Table 2). The Chi-square results presented in Table 3 further reveal a significant association between choice of place of delivery and women's demographic characteristics, but no significant association was observed between choice of place of delivery and NHIS coverage.

Table 2: Analysis of association between place of delivery and antenatal service received from different types of skilled health workers in Ghana

Antenatal care Provided by:	Categories ¹	Private (%)	Public/Govt. (%)	χ^2
Physician	No	81.6	63.1	54.9**
	Yes	18.4	36.9	
Nurse-midwife	No	15	21.7	6.5*
	Yes	85	78.3	
CHO ²	No	89.1	95.6	10.6**
	Yes	10.9	4.4	

Calculated from GDHS, 2014.

¹ (%) calculated within place of delivery; (N= 3107); **P < 0.001; *P < 0.05

² Community Health Officer



3.2 Association between Socioeconomic Characteristics and Private versus Public Facility Delivery

Analyzed by age groups, pregnant women between ages 25 and 29 were more likely to deliver in a public health facility than adolescent women, while women between the ages of 35 and 39 were more likely to deliver in a private health facility (Table 3). The majority of women who are over 18 years old usually delivered in a public health facility (88.4%), more than women under 18. Also, rich urban pregnant women were more likely to deliver their babies in a private facility compared to poor rural women. Although not significant, women with NHIS coverage were likely to deliver their babies in public facilities. This is probably due to the wide acceptance of the NHIS in all public facilities. There is a significant association between ethnic groups and type of facility delivery. Fifty-one percent of the pregnant Akan women were likely to deliver in a private health facility. There is a significant relationship between marital status and choice of public or private delivery facility ($\chi^2(1) = 14.9$; $p < 0.001$). In the religious affiliation category, 48.1% of women who delivered in a private health facility were Pentecostal Christians while a large proportion (35.8%) of the women who chose to deliver in a public facility were also Pentecostal Christians. The majority of Muslim women were likely to use public facility than private facility for child delivery.

Table 3: Bivariate analysis of formal health delivery in Ghana

	Private (%)	Public (%)	χ^2
Age groups (N= 3090)			13*
15-19	4.7	4.3	
20-24	13.6	18	
25-29	24.4	25.3	
30-34	23.4	22.3	
35-39	24.4	18.2	
40-44	6.1	9.2	
45-49	3.4	2.6	
Under age 18 (N= 1573)			4.46*
Under age 18	2.7	0.9	
Age 18 or older	97.3	99.1	
Marital Status (N= 4276)			14.9**
Never in Union	9.7	9.5	
Been in Union	90.3	90.5	
Has access to the internet on any device			24.4**
No	0.793	0.869	
Yes	0.197	0.105	
Region (N= 3090)			99.2**
Western	12.2	10.1	
Central	11.5	10	
Greater Accra	17.6	9.7	
Volta	5.1	7.9	



Eastern	8.1	9.1	
Ashanti	19.3	10.9	
Brong Ahafo	16.9	12	
Northern	2.4	9.1	
Upper East	5.4	12.5	
Upper West	1.4	8.8	
Rural-Urban Residence (N= 3090)			51.5**
Urban	71.9	49.4	
Rural	28.1	50.6	
Educational level (N=3090)			50.3**
No education	14.2	25.7	
Primary	12.5	20.1	
Secondary	62.4	49.4	
Higher	10.8	4.8	
Wealth Status (N= 3090)			92**
Poorest	9.2	23.9	
Poorer	14.9	19.3	
Middle	19.7	20.5	
Richer	21.4	20.7	
Richest	34.9	15.6	
NHIS Membership (N= 841)			0.52
No	43.8	36.6	
Yes	56.2	63.4	
Ethnic Groups(N=3089)			37.75**
Akan	51.4	41	
Ga/Dangme	7.1	4.9	
Ewe	13.3	11.4	
Guan	3.7	2.3	
Mole-Dagbani	16.7	27.7	
Grusi	2	4.8	
Gurma	2.4	4.4	
Mande	2	1.7	
Other	1.4	1.7	
Parity Status (N= 4276)			143**
Primipara (1)	25.8	25.4	
Multipara (2)	24.4	20.8	
Grand Multiparous (>3)	49.8	53.8	
Autonomy/HealthCare (N= 3616)			72.3**
Respondent Alone	29.9	22.1	
Respondent & partner	55	56.4	
Relative & community	15.1	21.5	



Religious Affiliation (N= 3090)		34.2**
Catholic	7.5	15.2
Anglican	0.3	0.9
Methodist	7.8	5.2
Presbyterian	6.4	4.6
Pentecostal/charismatic	48.1	35.8
Other Christian	10.2	13.4
Islam	16.6	21.2
Traditional/spiritualist	1.4	1.3
No religion	1.7	2.5

Calculated from GDHS, 2014

*P < 0.001**; P < 0.05**

3.3 Multiple Logistic Regression

The output of multilevel logistic regression models is presented in Table 4. In the partial model, women who received antenatal care from a nurse/midwife were significantly more likely to deliver in a public health facility compared with those who did not (OR = 1.565, $p = 0.003$; 95% CI: 1.64-2.103). The second model controlled for all the categories of antenatal care from skilled health personnel. The odds of delivering in a public health facility increased significantly from 1.56 in the first model to 1.661 ($p = 0.01$; 95% CI: 1.132-2.437). Women who received antenatal care from a physician were significantly less likely to use a public health facility for delivery (OR = 0.487, $p < 0.01$; 95% CI: 0.360-0.660) while those who received service from a community health officer were more than three times more likely to deliver in a public facility (OR= 3.312; $p < 0.01$; 95% CI: 1.747-6.278). The last model contains all antenatal variables, registration in NHIS, location variable, and socioeconomic status variables. The odds of women receiving antenatal care from a nurse-midwife fell by 33% from 1.661 to 1.328 ($p = 0.224$; 95% CI: 0.841-2.097). At the same time, the chances of women receiving care from a physician increased in the full model (OR= 0.530, $p = 0.01$; 95% CI: 0.370-0.760) but decreased for a CHO (OR= 2.236; $p < 0.05$; 95% CI: 1.037-4.819). The introduction of socioeconomic status and location variables reduce the effect of services from a nurse/midwife and a CHO but increases the likelihood for care by a physician by 53% in influencing choice of health facility delivery.

Furthermore, women who did not have to pay for drugs or other maternal health services (OR =2.99; $p > 0.05$; 95% CI: 0.397-22.662) were more likely to deliver in a public facility but the relationship was not significant. Among the different age groups, women in the reference category from ages 15 to 19 and the oldest women (45-49) were more likely to use a public health facility for delivery compared to other age groups (Table 4). Women residing in rural settings were 38% more likely to use the public health facility available in their area during delivery compared to their urban counterparts (OR= 1.38, $p = 0.08$; 95% CI: 0.962-1.973). Among the women in the highest level of education and wealth status categories, the odds of using a public facility for delivery decreased as both wealth status and level of education increased. Women who were multiparous (OR = 0.825; $p > 0.05$, 95% CI: 0.550 - 1.236) or grand-multiparous (OR = 0.751, 95% CI: 0.422 - 1.337) were 18% and 25% less likely, respectively, to deliver their index birth in a private health facility compared to women who were



primiparous. The result for NHIS enrollment, parity and autonomy decision-making were not significantly important in the final model.

Table 4: Multi-stage logistic regression analysis

Variables	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
<i>Nurse-midwife (RC: No)</i>	1(1,1)	1(1,1)	1(1,1)
Yes	1.57** (1.164-2.103)	1.661** (1.132-2.437)	1.328 (0.841-2.097)
<i>Physician (RC= No)</i>		1(1,1)	1 (1, 1
Yes		0.487** (0.36-0.66)	0.530** (0.370 -0.760)
<i>CHO/Nurse (RC: No)</i>		1(1,1)	1(1,1)
Yes		3.312** (1.747- 6.278)	2.236* (1.037-4.819)
<i>Out-of-pocket (RC: Yes)</i>			1 (1,1)
No			2.995 (0.397-22.662)
<i>NHIS Enrollment (RC: No)</i>			1 (1,1)
Yes			1.021 (0.698-1.494)
<i>Age groups (RC: 15-19)</i>			1*** (1,1)
20-24			0.277 (0.036-2.135)
25-29			0.377 (0.049-2.904)
30-34			0.350 (0.045-2.733)
35-39			0.253 (0.032-1.983)
40-44			0.484 (0.058-4.450)
45-49			0.148*** (0.016-1.334)
<i>Rural-Urban Residence (RC: Urban)</i>			1 (1,1)
Rural			1.38*** (0.962-1.973)
<i>Educational level (RC: No Education)</i>			1* (1,1)
Primary			0.792 (0.457-1.375)
Secondary			0.529** (0.331-0.846)
Higher			0.509*** (0.259-1.004)
<i>Wealth Status (RC: Poor)</i>			1** (1,1)
Middle			0.636*** (0.372 -1.087)
Nonpoor			0.440** (0.328 - 0.847)
<i>Parity Status (RC: Primiparous)</i>			1 (1,1)
Multiparous			0.825 (0.550 - 1.236)
Grand Multiparous			0.751 (0.422 - 1.337)
<i>Autonomy (RC: Respondent Decision)</i>			
Respondent & partner			1.261 (0.914 - 1.741)
Relative & community			1.331 (0.161 - 10.97)

Calculated from GDHS, 2014

OR = Odd ratio; CI = Confidence interval in parenthesis (); *p < 0.05, **p < 0.001 *** 0.1

3.4 Study Limitation

One particular limitation of this study is that we could not find any previous studies that examine women's choice of place of delivery by facility type as defined in this study. Therefore, it is difficult to compare our results to other studies in Ghana because no known study was found for Ghana on this topic. Moreover, identifying private health facilities that provide free maternal care in Ghana was a difficult task as the data available did not specifically stipulate this. In this study, we did not delineate private facilities that are NHIS affiliated and those that are not. This



probably influences our results. Future studies can identify and compare private facilities that are NHIS affiliated with public health facilities to determine the choice of private-public facility delivery among Ghanaian women.

4.0 CONCLUSION AND RECOMMENDATION

This study analyzed the influence of antenatal care provided by a Skilled Health Worker (SHW) on choice of facility delivery in a public or private setting and highlighted the importance of socioeconomic characteristics. The results from the Chi-square analysis indicated that there are significant differences between women who received antenatal care from the three categories of health care providers and public versus private health facility. Essentially, women who received antenatal care from either nurses/midwives or CHOs had a high likelihood of using a public facility for their next delivery but the odds decrease with the introduction of socioeconomic factors. Antenatal care services rendered by a physician remained less important even after adjusting for location and socioeconomic factors. This means that, patients who received ANC from a physician are more likely to use private care than public service. This category of users is likely to be the affluence who can afford private health facility costs and with preferential treatments. It is expected that behavior of this type will be common among the urbanites as most of the private health facilities are concentrated in the urban areas.

Despite the fact that maternal health is free in Ghana through NHIS, choice of type of delivery facility depends on many other factors beyond the scheme. This finding supports Johnson's (2016) conclusion that the NHIS policy in Ghana was a trivial factor for why women deliver in health facilities at the district level. However, model 1 and model 2 provide evidence of how services received from different health workers during ANC visits could influence the decision of a pregnant woman to continue to use the service from the initial health facility visited. The varied experiences of women during antenatal care at the facility level have been discussed extensively in other maternal health studies (Chemir et al. 2014). We found NHIS alone to be non-significant in choice of type of facility delivery; even though it encouraged more public facility deliveries, it does not guarantee 100% access to delivery care.

Woman's age proved to be an important factor influencing the decision of whether to use a public or private health facility. One important reason why younger mothers are likely to use a public facility is because of the cost implications and their economic vulnerability. Furthermore, the reason why young women use public facilities might be due to early marriage or teenage illicit pregnancy. Early marriage or unplanned parenthood among young women limits their socioeconomic potentials and makes them largely dependent on outside social support such as from the free maternal care policy. Meanwhile, the older age group also use public health facilities due to their past birth experiences and familiarity with a birth attendant (Pomeroy, Koblinsky, and Alva, 2007).

Women's empowerment, defined as wealth and education, also may influence decisions about whether to deliver in a private or public facility. Decision autonomy was used as one of the measures of women's empowerment in this study. A study in Ghana recorded a strong relationship between women's empowerment and choice of facility delivery (Asante-Sarpong et al., 2016). Both high education level and wealth status may reduce the chances of a woman using a public health facility because women in high social classes may seek specialized treatment,



such as private wards and special facilities, that may not be available in public health facilities, particularly in rural areas. The private-for-profit health providers will do everything to compete with the public health facilities because health is more of a business than a social service to them (Pomeroy, et al., 2007). In addition, because of delays in reimbursement from the NHIS authority (NHIA), private providers target the upper classes in the wealthy categories who can afford to pay their bills without waiting for long, bureaucratic delays in reimbursement from the government (Aryeetey et al., 2016).

Though the focus of this study was to evaluate the influence of the type of antenatal care provider on choice of type of facility delivery (public or private), community health intervention programs such as Community Health and Planning Services (CHPS) increases rural women's use of public health facilities. Nyortor et al. (2005) elucidate the strong impact of CHPS on the use of public health facilities for delivery among rural women. In sum, the dominant choice of public health facility utilization can be perceived as 1.) the outcome of community health workers (CHWs) who disseminate adequate health information to the underserved and deprived rural women 2.) lack of availability and cost of using private health facilities.

The CHPS, which aims to reduce the barrier of distance facing rural communities, is operating in more than one hundred districts in Ghana (Nyonator et al., 2005). Rural women are poor and have a low preference for special treatments compared to their rich urban counterparts, leaving them with community health services. Due to an individual's or community's economic situation, even in the case that a complication arises and a patient needs to be referred, a distant public health facility will be sought after rather than the closest private facility. This is due to the cost of services in private-owned facilities and direct charges for service delivery. However, the delay in transferring a patient from a referring facility may expose the patient to a higher risk of maternal death by the time they arrive at the district public hospital that offers more comprehensive services. As recorded in the literature proximity rather than quality of service was more important to rural users of maternal health facilities. In contrast, quality of service was more important to most urban women except for the vulnerable among them—the urban poor.

Our analysis of antenatal care provider on the choice of final place of delivery – public or private using Ghana DHS data reveals four important findings.

1. Women who received ANC from physicians are less likely to use public facilities for delivery continuously.
2. From the multilevel logistic regression model, the introduction of SES and locational factors reduced the use of public health facility delivery for women who received ANC from a nurse/midwife or CHO. This reduced statistical power of antenatal care providers, thus demonstrates the importance of SES and location factors in the decision to deliver in a public health facility.
3. Women with higher socioeconomic status are likely to use private facilities for delivery irrespective of geographic location and care provider during ANC.
4. NHIS enrollment was a trivial factor in the choice of type of health facility delivery in Ghana.

This study thus adds to the existing knowledge on maternal health care utilization and associated challenges. Maternal health, so the health workers are integral parts of the health sector and may



be difficult to separate from other health care. Intensifying maternity training to enhance quality perception of health care provided by skilled health workers for continuous use of healthcare facilities will not only indirectly reduce maternal mortality but will strengthen and build trust in Ghana's health care delivery system.

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