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**Effect of Antenatal Care Visit on Choice of Health Facility for Childbirth in Ghana**

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**Abstract**

Maternal and child mortalities are among major health problems facing developing countries such as Ghana. Most of these deaths can be avoided by utilization of maternity health care services. The study examines the effect of antenatal care (ANC) visits and other socioeconomic factors on the utilization of health facilities for childbirth services in Ghana. The study used data from the 2008 Ghana Demographic and Health survey. Data were analyzed for descriptive statistics as well as a Multinomial Logistic Regression for identification of factors that influences delivery in health facility. The study results have shown that, Antenatal care (ANC) visits and wealth significantly influence expectant mothers decision to use government health facilities for childbirth. Also, the study revealed considerable variations in region and between rural and urban utilization of this services in Ghana. It is recommended that to improve the

utilization of health facility for childbirth services and hence maternal health care utilization, there is the need to improve public awareness on the importance and benefits of ANC visits. Policy should also target mothers' who have had the experience of child birth on the need to use health care facility services for each pregnancy.

**Keywords**: maternal mortality, ANC, childbirth, health facility

## INTRODUCTION

The World Health Organization (WHO, 2011) defines antenatal care (ANC) as "care before birth, and includes education, counseling, screening and treatment to monitor and to promote the well-being of the mother and baby". The RCH /PHD-GHS annual report (2010), defines ANC as"the health care and education given during pregnancy", it is "an important part of preventive and promotive health care". According to Ghana's Ministry of Health (2010), the main goal of antenatal care is to promote and maintain the health of pregnant women since ANC establishes contact with pregnant women in order to detect and manage current health problems. It must be stated that, it is only appropriate ANC use that would significantly help in identifying and mitigating the risk factors in pregnancy.

Magadi et al. (2000) posits that the failure to receive appropriate ANC during pregnancy can lead to undesirable pregnancy outcomes such as maternal morbidity, low birth weight for the baby or even maternal and perinatal mortality. The World Health Organization (WHO, 2008) recommends a minimum of four ANC visits for a pregnant woman before delivery if the woman cannot make the number of visit s as directed by the physician/ provider. Lwelamira and Safari (2012) have also found a significant correlation between health facility delivery and the number of antenatal care visits. However, Nketiah-Amponsah and Sagoe-Moses (2009) found that, ownership of health insurance, place of residence, utilization of antenatal care services and distance to health facilities were significant predictors of the demand for institutional and supervised delivery.

Though a number of policies and programmes have been developed to improve maternal health care utilization in Ghana such as the Safe Motherhood Programme which was launched in 1993; the NHIS which was launched in 2003 to abolish the cash-and-carry system and the most recent one being the MDG5 Accelerated Framework (MAF) developed by the MOH to improve the country's maternal health and also assist in attaining the MDG5 target, the rate of increase in institutional and supervised delivery is still very low, especially in rural Ghana.

The underlying cause of low utilization of health facility based delivery in Ghana needs further investigation in order to be better understood and appropriately addressed by reproductive health programmes. To develop effective strategies for increasing the utilization of healthcare facility delivery in Ghana, it is necessary to understand the factors influencing the choice of place for childbirth. Hence, the objective of this study is to investigate the effect of Antenatal

care visit on the choice of health facility for childbirth in Ghana and also find out if there are other socioeconomic variables that influence the choice of health facility for childbirth. This will help improve maternal health care services utilization, especially institutional delivery in Ghana and which also help reduce the maternal mortality rate in a bid to achieve the 5th Millennium Development Goal.

**Determinants of choice of health facility for childbirth**

The socioeconomic variables that do influence the choice of health facility for childbirth are age, level of education, birth order, residence (rural/urban), geographical location (region of residence), wealth and accessibility to health facilities. These are other potential variables that are likely to aid the expectant mother in making choice regarding the health facility for childbirth. Age has been shown to be one of the important determinants for choice of place for childbirth by expectant mothers. It is believed that women's current age is an important determinant of the utilization of medical services (Elo, 1992; Fosu, 1994). According to Abor and Abekah-Nkrumah (2011), mother's age indicates women's accumulation of knowledge in health care services utilization and has a positive influence on the use of health services. On the other hand, younger women are rather likely to utilize modern health care facilities than older women, as they are likely to have greater exposure and knowledge to modern health care, also more access to education.

Empirical studies have shown different findings on the influence of age on health services utilization. Kistiana (2009) found that, women's age was positively related with the utilization of place of delivery in Indonesia. Owoo and Lambon-Quayefio (2013) explore the importance of social influence and the availability of health insurance on maternal care utilization in Ghana and found that women's age and their intensity of antenatal care use were positively related. The explanation proposed is that older women may be more aware and needful of the benefits of antenatal care and are therefore more likely to use these services more intensively. Lwelamira and Safari, (2012) found a positive effect of age on place of delivery among very young and older women in Central Tanzania in their studies on health facility delivery among women. A number of other studies in Ghana and Southern Indian support the finding that older women are more interested in seeking and utilizing maternal health care services than younger women (Addai, 2000; Navaneetham and Dharmalingam, 2002).

Alongside the mothers age is the birth order. Birth order is another factor that affects the utilization of maternal health services. The expectant mothers' use of health services may be influenced by her previous experience with delivery. Onah et al. (2006) found a significant association between choice of institutional or non-institutional deliveries among pregnant women and birth order in southeastern Nigeria. Another study by Wong et al. (1987) in urban areas of Philippines found that the probability of choosing either public or private modern care instead of traditional care decreases as the number of children aged zero to six years old

increases. Overbosch et al. (2004) found that "pregnancy is a natural process and women with some experience might consider antenatal care less necessary". Ekele and Tunau (2007) also argued that women of high parity in Sokoto, Nigeria, were more likely to decide to prefer home delivery with unskilled attendant. Also in a similar study by Arthur (2012) ANC utilization falls with an increasing number of living children. Several other studies have concluded that, birth order may influence health seeking behaviours for maternity health care services among women (Van Eijk et al., 2006; Danforth et al., 2009; Mpembeni et al., 2007; Mrisho et al., 2007; Fotso et al., 2009).The reasons for this trend could be that women with first child pregnancy are more cautious about their pregnancies and therefore sought out trained professional. Also, as the number of children borne increases, women may tend to believe that modern health care is not as necessary and tend to rely more on her past experiences and knowledge from the accumulated previous and finally, higher birth order suggests a greater family size and hence lower resources (both time and money) available to seek formal healthcare.

The level of education of the mother has also been shown to be one of the most important determinants of maternal health services use. According to Grossman (1972), education makes a person efficient in the use of health services and may enable the individual to choose a more health conscious behavior to improve health. For instance, Arthur (2012) and Owoo and Lambon-Quayefio (2013) both found a positive relationship between education and antenatal use in Ghana. Lwelamira and Safari (2012) found that women with at least secondary education were two times more likely to deliver a in health facility compared to those with primary or no formal education in Central Tanzania. Also in a similar study by Abor et al (2011) in their study on the socioeconomic determinants of maternal health care utilization in Ghana, the authors found that women with at least primary education were more likely to utilize maternal health services compared to those without education. Several empirical studies have found a positive relationship between the education of mothers and the utilization of maternal health care services (Addai, 2000; Chakraborty et al., 2003; Mekonnen and Mekonnen, 2003; Gage, 2007). A study by Gage (2007) in Mali has shown that the odds of utilizing prenatal care increases with the level of education, Mekonnen and Mekonnen (2003) also concluded that highly educated mothers were more likely to use maternal health service than less educated ones in Ethiopia. Babalola and Fatusi (2009) revealed that women with higher education are more likely to use antenatal service and rely on medical personnel for delivery in Nigeria. The above argument supports the fact that better educated women are more aware of health problems, know more about the availability of health care services, and use this information more effectively to maintain or achieve good health status. Alongside expectants mother's level of education is husband's level of education. Husband's education is another key factor that has been found to influence the utilization of health care services. Kistiana (2009) found that women who have more educated husbands were more likely to use health facilities for delivery as compared to the women whose husbands were not educated or with only primary education. Caldwell (1990) also found that men with higher educational attainment played a more important role in child-care decisions than men with less schooling. The reason for this could be that more

educated husband's may be aware of the benefits associated with the use of these services and hence can influence their wife's decision to seek modern health-care services especially during delivery.

Place of residence has been found to be one of the important factors that influence maternal health care utilization. The argument is that most urban residentsmay be relatively closer to health care facilities than their rural counterparts. Stock (1983) showed that physical proximity of health care services, especially in developing country context, plays an important role in utilization of these services. Overbosch et al. (2004) revealed that "currently, more than a third of the rural women have to travel more than 5km to the modern provider of ANC" in Ghana. Thus accessibility to health care services may be much easier for the urban residents than those in the rural areas. Lwelamira and Safari (2012) concluded that the chance of delivery in health facilities decreased with increasing distance to the nearest health facility. Therefore women located more than 10 km from the nearest health facility were less likely to deliver in health facility as compared to those living within 5 km from nearest health facility. Kistiana (2009) found that the most important variable influencing maternal health in care utilisation especially using a health facility as the place of delivery was the place of residence of the expectant mother.

Arthur (2010) also found that women in urban areas were more likely to use health services (ANC) as compared to rural dwellers using the ordered logistic regression model in his analysis of the determinants of ANC use in Ghana. Mensaklo (2010) found that a mother lives in an urban area has a smaller chance of losing her infant relative to a woman who lives in a rural area. Nketiah-Amposah and Sagoe-Moses (2009) indicated that distance to the nearest health facility is significant and negatively related to maternal health services utilization in Ghana. Mekonnen and Mekonnen (2002) concluded that rural women are less likely to use maternal health services. However, Abor and Abekah-Nkrumah (2011) found a significant inverse relationship between place of residence and the use of maternal health services. Compared to those residing in rural areas, urban women were less likely to utilized maternal health services especially place of delivery and postnatal services. This however contradicts what other researchers have found empirically.

Several empirical studies have found health services utilization to be positively affected by wealth, since it shows the economic status of the individual/family. Owoo and Lambon-Quayefio (2013) found that women belonging to the 'richer' and 'richest' wealth categories appear to utilize maternal care services more frequently than women in the 'poorest' category, controlling for possession of health insurance. This may be explained by the presence of other additional cost associated with maternal health care which the existing health insurance scheme may not adequately cater for (Arthur, 2012). Abor and Abekah-Nkrumah (2011) concluded that compared to those in the poorest household, those in the poorer household are more likely to deliver in a health facility, with those being in the middle wealth quintile being more likely to

use antenatal services and deliver at a health facility. Lwelamira and Safari (2012) also found that women from poor families may fail to use health facilities for delivery due to lack of money for transport when the facility is located at a distant place and lack of money to pay for delivery kit as well as food while at health facility in Central Tanzania. A study by Gage (2007) revealed that household poverty and personal problems were inversely related to the use of maternal health care. Mensaklo (2010) found that controlling for geographic, demographic and healthcare variables, wealthy households are less likely to have their babies die before the age of one showing that wealth facilitates access to quality health services.

Accessibility of health services has been found to influence the use of maternal health services. The spatial distribution of health care institutions in Ghana is a major problem as majority of Ghana's population live in rural areas where poor road networks make health care accessibility a major challenge and where also the private providers of health care rarely provide health services. The poor geography of such places makes it difficult for government health services to be easily reachable. The distance from health facilities increases the cost of access to professional care; in that the time spent reaching the nearest facility may represent a significant negative opportunity cost. Mpembeni et al. (2007) found that the proportion of women with skilled attendants at delivery decrease with increasing distance to the health facility in Southern Tanzania.

## METHODOLOGY

**Theoretical Framework**
This study derives its theoretical framework from the principles of utility maximization in health care utilization proposed by Grossman (1972) and based on the approach formulated by Mwabu, Ainsworth and Nyamete (1993). A restatement of this model, a modification of which is adapted for this study, is presented below.

In the event of being pregnant, the expectant mother is assumed to seek help from a health care system characterized by many providers. The expectant mother is further assumed to choose the health care alternative that yields the maximum expected utility. Conditional on seeking treatment, the direct utility derived by individual $i$ from treatment alternative $j$ can be expressed as:

$$u_{ij} = u_{ij}(h_{ij}, c_{ij}) \qquad\qquad\qquad (1)$$

Where $u_{ij}$ is the direct conditional utility that individual $i$ expects from health care Provider $j$; $h_{ij}$ is the expected improvement in health status for individual $i$ after receiving treatment from provider $j$, and $c_{ij}$ is the consumption of non-health care goods, the amount of which depends on choice $j$, because of the monetary and nonmonetary costs of treatment from provider $j$. To facilitate empirical work, the unobservable variables, $h_{ij}$ and $c_{ij}$, can be expressed as:

$$h_{ij} = h(w_i, q_{ij}) \qquad\qquad\qquad (2)$$

Where $w_i$ is a vector of observable socioeconomic attributes of individual $i$, such as age, educational level, marital status, ethnicity, religious affiliation and others; $q_{ij}$ is a vector of medical and physical attributes faced by individual $i$ in facility $j$, such as availability of drugs and medical equipment and sanitary conditions of the facility;

$$c_{ij} = y_i - r_{ij} \tag{3}$$

Where $c_{ij}$ is the monetary value of non-health care goods that individual $i$ can consume after paying for medical care in facility $j$; $y_i$ is annual income of household $i$; $r_{ij}$ is the value of resources that individual $I$ devotes to medical care received from facility $j$. The level of $r_{ij}$ is determined by such factors as the treatment fees, waiting time, and access variables such as distance, travel time and perceived quality of health care services at the nearest health facility and can be written out in full as follows:

$$r_{ij} = M_{ij} + wT_{ij} \tag{4}$$

where, $M_{ij}$, is the total monetary cost of seeking treatment from health facility $j$ for individual $i$; $T_{ij}$ is the travel time to health facility $j$ for individual $i$, including the time spent to wait for treatment there; and $w$ is the shadow wage rate. Notice that expressions (3) and (4) are merely accounting identities, which permit identification of $c_{ij}$; a variable for which information is normally not collected in health care demand surveys.

Equations (1) to (4) represent a general structural specification of a behavioral model of health care demand. The next stage is the choice of the functional form for the utility function in Equation (1). As is well known, there are many functional forms to choose from. A mathematical form for the utility function that is consistent both with actual demand behavior and with rules of rational choice is needed. Given that the utility function in Equation (1) is linear in health status and quadratic in consumption, it is consistent with well-ordered preferences. Such a functional form generates typically observed demand patterns.

What is of interest in these specifications is the variation in monetary or time prices across health care providers that ensure identification of behavioral parameters; so that given this role of prices, and a further assumption that consumer preferences over the entire range of consumption goods are well defined, empirical health care demands can be shown to be consistent with the assumption that ill individuals maximize an indirect conditional utility function, $v_{ij}$ as shown in Equation (5) below:

$$v_{ij} = v_{ij}(w_i, q_i, y_i, p_{ij}, a_i) \tag{5}$$

Where $w_i$, $q_i$, and $y_i$, are as previously defined; $p_{ij}$, is the price of health care received by individual $i$ from health facility $j$; $a_i$ is the price of non-health care good consumed by individual $i$.

The general functional form for the indirect utility function in (5) contains three important features. First, by solving (5) one gets health care consumption bundles, rather than health status improvements or health outcomes. Second, consumption of non-health goods and services is constant for different levels of medical services. The constancy is achieved by assuming that the direct utility function that underlies (5) is separable in medical care goods and other consumption bundles. Third, apart from other prices, the indirect utility function in (5) is dependent on "medical care" prices and not on prices of "improvements in health status."

However, the undesirable feature of (5) is that, in the underlying direct utility function, people's welfare depends on medical care services, rather than on health outcomes. This disadvantage is mitigated by the fact that in the event of illness, people restore health status by consuming medical care services. Thus Equation (5) permits an investigation of direct demand effects of prices and incomes and is the standard expression for the indirect utility function in consumer demand theory (Mwabu et al, 1993).

In the present context, it shows the maximum utility that individual $i$ can achieve, conditional on seeking treatment for an illness, controlling for income $y_i$, health care prices $p_{ij}$, prices of other goods $a_i$, personal attributes $w_i$, and facility specific characteristics $q_i$. To ease econometric work, $a_i$ may be normalized to unity. Normalization of this variable in our case is desirable because its variation in the sample is small. Notice further that all the elements of the indirect conditional utility function in Equation (5) are directly observable and are the variables of interest to policymakers. Econometric implementation of the model requires the standard assumption that the utility function in Equation (5) is stochastic, and is of the form:

$$v_{ij} = v_{ij}^* + \mu_i \text{———————————————————————— (6)}$$

where $v_{ij}^*$ is the systematic component of utility and $\mu_i$ is an additive disturbance term. Assuming that $\mu_i$ is normally distributed, equation (6) leads to a multinomial logit specification of individual choice of medical treatments and the probability that individual $i$ will seek treatment from health facility $j$ can be expressed as:

$$f\left(h_{ij}\right) = \frac{u_i^{v_{ij}^*}}{\sum u_i^{v_{ij}^*}} \text{————————————————————————(7)}$$

Which is the multinomial specification where, f ($h_{ij}$) is the probability that individual $i$ will seek healthcare from provider $j$; $h_{ij}$ is healthcare provider alternatives from which individual $i$ can seek treatment for $j = 0…j=2$ and include, 0 = home delivery, 1= government hospital and 2= private hospital; $\mu_i$ and $v_{ij}^*$ are as previously defined. But $v_{ij}^*$ can be expressed as

$$v_{ij}^* = \beta W_i + \phi Q_j + \delta P_{ij} \text{———————————————————(8)}$$

In which case (7) becomes:

$$f(h_{ij}) = \frac{\mu_i^{\beta w_i + \phi q_j + \delta p_{ij}}}{\sum \mu_i^{\beta w_i + \phi q_j + \delta p_{ij}}} \quad\text{————————————————— (9)}$$

Where $f(h_{ij})$, $h_{ij}$ and $\mu_i$ are as previously defined; β, ϕ and δ are vectors of coefficients of $w_i, q_j$ and $p_{ij}$ respectively to be estimated.


**Estimation technique**
The estimation of equation (9) can be done using the log likelihood function. The log-likelihood function that needs to be maximized in order to estimate the values of the parameter vectors; β, ϕ and δ is simply:

$$L = \sum_i \sum_j G_{ij} \log p_{ij} \quad\text{————————————————— (10)}$$

Where $L$ is the logarithm of the likelihood function; $G_{ij}$ = 1 if individual $i$ chooses health facility j; otherwise $G_{ij}$ takes a value of zero. The estimated values for; β, ϕ and δ show the marginal effects of social and provider characteristics on conditional utility from a medical care provision alternatives, as shown for example, in equation (7). Expression (9) can be used to estimate a multinomial logit.

The above general model of utility maximization using a random utility model based on McFadden (1973) can be applied using the basic multinomial logit model expressed as:

$$P_r(y = j) = \frac{e^{x\beta_j}}{e^{x\beta(1)} + \cdots + e^{x\beta(j)} + e^{x\beta(J)}} \quad\text{————————————————— (11)}$$

In order to achieve identification, we modify the equation by setting one of the coefficients to zero (Lindelow, 2002). Here the home delivery option is the one set to zero; hence it is the reference healthcare option. All the variables in the modified model are relative variables; they permit estimation of the effects of care options relative to self-care. The modification enables us to interpret our results relative to a reference group. In terms of utility, they denote the extra utility gained by using specific facilities above that of home delivery.

The specific equation used to estimate the determinants in the choice of place for child-birth is given as:

$$P_{ij} = \frac{e_i^{\sum \beta_{1i} X_{1i} + \sum \beta_{2i} X_{2i} + \sum \beta_{3i} X_{3i} + \sum \beta_{4i} X_{4i}}}{\sum e_i^{\sum \beta_{1i} X_{1i} + \sum \beta_{2i} X_{2i} + \sum \beta_{3i} X_{3i} + \sum \beta_{4i} X_{4i}}} \quad\text{————————————————— (12)}$$

Where $P_{ij}$ refers to the options of place for child-birth available to a woman who is pregnant or at least has given birth before (thus, home, government hospital and private hospital); $X_{1i}$ is a vector of socio-economic factors, $X_{2i}$ represents geographic factors, $X_{3i}$ is a vector of demographic variables and $X_{4i}$ represent healthcare variables.

Estimation of equation (12) requires the use of numerical methods to find values of parameter vectors that maximizes the likelihood (the log-likelihood) of observing the sample data. It is assumed that the healthcare providers form a set of mutually exclusive choices. Each sample respondent is a random and independent draw from the universe of respondents. Thus, the logarithm of the likelihood function $L_i$, for the observable sample of respondents, N, is given by

$$\ln L_i = \sum_{i=1}^{N}\sum_{j=1}^{J} D_{ij} \ln P_{ij} \tag{13}$$

Where $D_{ij}$ is a dichotomous variable that takes on the value unity if the respondent chooses alternative j and zero otherwise. The interpretation of the estimated coefficients is complicated by the fact that the model is nonlinear in the explanatory variables. This means that the effect of independent variables on the probability of seeking a particular type of care will depend on the value of that and other independent variables. For this reason, results are best interpreted through the analysis of marginal effects. For the continuous independent variables, the marginal effects were computed at their means. For the categorical variables, however, the marginal effects were calculated as the discrete change in the independent variable form 0 to 1. The marginal effect is given as:

$$\frac{\partial P_{ij}}{\partial X_i} = P_{ij}(\beta_j - \bar{\beta}_i) \tag{14}$$

Where

$$\bar{\beta}_i = \sum_j P_{ij}\beta_j$$

**RESULTS AND DISCUSSIONS**

The study uses data from the 2008 Ghana Demographic and Health Survey (GDHS). The survey is carried out every five years (In Ghana, it was carried out in 1988, 1993, 1998, 2003, 2008). The survey collects data on fertility, family planning, maternal and child health. A special survey on maternal health was carried out in 2007. The sample consists of women within the ages of 15–49 with a live birth in the five years preceding the survey. This is a representative sample containing 11,888 women. This study analyzes response from 1,951 women aged 15–49, who have at least one child under age five at the time of the survey. The questionnaire consists of questions on demographic indicators, health status, illness and visits to a doctor, health behavior such as questions on smoking, drinking alcohol, physical activity, and eating habits. To measure the choice of health facility for childbirth government/public and private health facilities has been used and home delivery is considered to be the based outcome.

**Table 1: Proportions of Place of Delivery and Number of Antenatal Visits**

| Place of delivery | Number of Antenatal Visits | | | | Total |
|---|---|---|---|---|---|
| | No visit | One visit | 2 – 3 visits | At least 4 visits | |
| Home | 68 | 38 | 195 | 541 | 842 |
| Gov health facilities | 8 | 13 | 76 | 859 | 956 |
| Private health facilities | 0 | 0 | 15 | 138 | 153 |
| Total | 76 | 51 | 286 | 1,538 | 1,951 |

**Source:** Constructed by author from the 2008 GDHS dataset

The results in table 1 above reveal that, out of the total 842 births that occurred at home, 68 respondents representing 8.08% had never visited any health facility for ANC service. Also 4.51% of them had one visit for this service, whilst 23.16% and 64.25% of them had two to three visits and at least four visits respectively. Again, government health facilities accounted for 956 births and out of this, 8 respondents representing 0.84% had no ANC visit and with 13 of them representing 1.36% and 76 also representing 7.95% attending one and two to three ANC visits. The remaining 859 representing 89.85% of them had at least four ANC visits. Finally, private health facility recorded 153 deliveries and 15 representing 9.21% of the respondents had two to three ANC visits and 138 also representing 90.79% had at least four ANC visits whilst recorded zero deliveries for respondents with one and no visit. This means that, expectant mothers who attend several ANC visits are more likely to give birth at a health facility. The reason for this could be attributed to the advice given to expectant mothers by health professionals during antenatal care visits which include, among others, advice on delivery in health facility. This calls for the need to encourage women to attend antenatal care services and the use of this opportunity to educate women on the importance of delivery in health facility for their health as well as the health of their babies.

**Empirical Results**

**Table 2: Multinomial Logistic Estimates of Institutional Delivery Care Services Utilization in Ghana**

| Variables | Government health facilities | | Private health facilities | |
|---|---|---|---|---|
| | Marginal effect | P value | Marginal effect | P value |
| **Age** | 0.0080*** | 0.009 | -0.00001 | 0.955 |
| **Antenatal care visit (No visit as base)** | 0.1540*** | 0.000 | 0.0096** | 0.017 |
| **One visit** | 0.2597*** | 0.001 | 0.0034 | 0.270 |
| **2-3 visits** | 0.2977*** | 0.000 | 0.9984*** | 0.000 |
| **At least 4 visits** | 0.3507*** | 0.000 | 0.1672*** | 0.000 |

| | | | | |
|---|---|---|---|---|
| **Wealth Quintiles(poorest as base)** | | | | |
| Poorer | 0.1662*** | 0.000 | 0.0093 | 0.156 |
| Middle | 0.2008*** | 0.000 | 0.0062 | 0.331 |
| Richer | 0.2919*** | 0.000 | 0.0115 | 0.152 |
| richest | 0.3488*** | 0.000 | 0.0223* | 0.087 |
| | | | | |
| **Birthorder** | -0.0291*** | 0.006 | -0.0004 | 0.607 |
| **Education** | | | | |
| Primary | 0.0404 | 0.283 | 0.0020 | 0.507 |
| Secondary | 0.1283*** | 0.002 | -0.0001 | 0.963 |
| tertiary | 0.1890 | 0.184 | 0.0018 | 0.788 |
| | | | | |
| **Husband's educ** | | | | |
| Primary | 0.1291*** | 0.006 | 0.0059 | 0.354 |
| Secondary | 0.1037*** | 0.009 | 0.0004 | 0.900 |
| Tertiary | 0.2660*** | 0.000 | 0.0019 | 0.693 |
| **Region** | | | | |
| Western | 0.0637 | 0.353 | -0.0059*** | 0.004 |
| Central | 0.0635 | 0.400 | 0.0003 | 0.923 |
| Greater Accra | 0.1746*** | 0.002 | -0.0059*** | 0.007 |
| Volta | 0.1480** | 0.014 | -0.0077*** | 0.000 |
| Eastern | 0.1596*** | 0.004 | -0.00004 | 0.989 |
| Ashanti | 0.2229*** | 0.000 | -0.0050** | 0.017 |
| BrongAhafo | 0.0855 | 0.199 | -0.0071*** | 0.005 |
| Upper East | 0.2815*** | 0.000 | -0.0277*** | 0.000 |
| Upper West | 0.2409*** | 0.000 | -0.0096*** | 0.000 |
| Accessibility | 0.1061*** | 0.001 | 0.0003 | 0.889 |
| Rural resident | -0.1850*** | 0.000 | -0.0057** | 0.047 |

No. of obs  =  1,951        Wald chi2(54) = 13331.06          Prob> chi2 = 0.0000

Pseudo R2  =   0.2420        Log pseudo likelihood   =   -1347.1944

Note: significant levels are *** $p<0.01$, ** $p<0.05$, * $p<0.1$ and home delivery care services is the base outcome.

The paper sought to examine the effect of ANC visit and other socioeconomic variables on the choice of health facility for childbirth in Ghana. The marginal effects of ANC visits (thus, one visit, 2-3 visits and at least 4 visits) are all positive and significant at 1% for using government health facilities for childbirth services and only 1% for at least 2 visits in using the private health

facilities. The size of the coefficients also increases with the number of ANC visits (0.2597, 0.2977 and 0.3507) in the government health facility. The results further indicate that, as expectant mothers who attend ANC visits increases, they tend to use health facilities for childbirth than home delivery services relative to their counterparts with no visit. Although the utilization of antenatal care provided by health professionals is relatively high in Ghana, the utilization of childbirth care at health facilities is still low and the incidence of most maternal deaths occur during delivery due to direct obstetric complications, such as excessive bleeding and eclampsia.

The age and birth order of the expectant mother are other factors that also influences the decision of the expectant mother to choose a particular health facility for childbirth in Ghana. Age is found to be positively related to- and a significant determinant of demand for institutional delivery care services from the government health facilities. The marginal effect is positive and significant at one (1) percent. Thus, the study suggests that as a woman ages, all other things being equal, she would prefer her delivery at government hospitals to that at home. The marginal effect of 0.0080 indicates that when a woman attains one additional year, the probability of her giving birth at government health facilities increases by 0.80 percent. It may also be explained that, older women may have accumulated knowledge of health care services, which may positively influence their use of maternal health services. Birth order, on the other hand, has a negative sign for both government and private health facilities implying that an increase in the birth order of the mother tends to decrease the probability of demanding such services relative to home delivery services. It is significant at 1% for government facility. The negative relationship may be due to the fact that, once a woman has gone through the experience of child birth, she may be reluctant to undertake many institutional delivery care services for other pregnancies, this may be due to experience with the service or the fact that she begins to think that she probably has an idea of what is required of her during her pregnancy and child birth.

Education, residence, wealth and access to a health facility have been found to also influence the expectant mother's decision in choosing a particular health facility for childbirth in Ghana. The findings revealed that, education of the expectant mother is positively related to institutional childbirth in both the government and the private health facilities. Again, the acquisition (by a woman) of secondary education is found to be significant at 1% in influencing the choice of government health facilities over a home facility for childbirth. Thus an increase in the level of education will increase childbirth services utilization from the government facility by the increase in the size of the coefficient from those with primary to those with tertiary levels of education. It's being argued that women education enhances their independence, confidence and capacity building, which are important for decisions regarding their health. This suggests that, improving the education of the mother in Ghana, will contribute greatly to the use of maternal healthcare services including institutional delivery. Hence the promotion of females' education up to at least the secondary school level is seen as the most effective measure in

improving maternal and child health services in Ghana.

With regards to husband's education, the findings indicate a positive relationship between husband's education and institutional childbirth from the government health facilities. Husbands with primary and secondary and tertiary education are found to be significant at 1%. This means that husbands with at least primary education tend to influence the decision of the expectant mother regarding the use of health facilities for childbirth services. Thus an increase in the level of education of the husband will increase the expectant mother's utilization of government health facility for childbirth. One possible explanation for this result is that husbands can influence the wife's decision to seek modern health care services.

The results of the study also show a positive relationship between each of the regions of the expectant mothers and the utilization of government health facility for childbirth, compared to those in the reference category (expectant mothers in the Northern Region). From the results, except for Central, Western and Brong-Ahafo Regions, the rest of the Regions are significant at 1%, and 5% for Volta region. However, the results also indicate that, except for the Central Region, the rest of the Regions show a negative relationship with the utilization of private health facility for delivery. Also from the results, except for Central and Eastern Regions, the coefficients for the rest of the Regions are significant at 1% and 5% for Ashanti Region. This however, implies that expectant mothers in the regions prefer home delivery to delivering their babies at private health facilities. The possible reason could be that using the private health facilities for such a service may not be accessible and even if accessible may be very expensive.

In addition to the geographical location (region) of the expectant mother is place of residence (rural/urban). Being a rural resident is found to be negatively related to the use of institutional delivery care services for childbirth in both government and private health facilities as compared to those in the reference group (urban). Place of residence is significant at 1% and 5% for both government and private health facilities respectively. This implies that rural women are more likely to deliver at home compared to their urban counterparts. The negative effect might indicate that the distribution of health facilities between urban and rural are in favor of the urban dwellers, putting the rural dwellers at a disadvantage in terms of availability, accessibility and quality of service provided. Also, transportation to the facility may also serve as a constraint to the use of the service since it is known that, the road network is mostly poor in the rural areas compared to the urban areas.

The variable wealth, as expected, has a positive relationship with institutional delivery care services utilization. The marginal effects of the wealth quintiles poorer, middle, richer and the richest are all positive and significant at 1% for government health facilities and only significant at 10% for the richest quintile in the private health facilities. The sizes of the coefficients also increase with the wealth quintiles (0.1662, 0.2008, 0.2919 and 0.3488). The results suggest that, expectant mothers in the poorer, middle, richer and the richest quintiles are more likely to

utilize health facilities for delivery services especially government health facilities over those in the reference group (expectant mothers in the poorest quintiles). This signifies that wealth is an important variable in the utilization of maternal health services, especially childbirth and thus policy should focus on providing some means of support to expectant mothers, especially those in the lowest wealth brackets, to help in their use of maternal healthcare services alongside the free maternal health policies. The results suggest that, accessibility of health facilities to a woman is positively related to the use of health facilities for childbirth in the government health facility. It is significant at 1% in the utilization of government health facility for child delivery and not significant in the private health facility for childbirth. Accessibility being positive and significant at 1% in government facility means that, the more accessible a government health facility is to an expectant mother, the higher the demand for its services in times of childbirth relative to home services.

## CONCLUSIONS AND RECOMMENDATIONS

The study examined the effect of ANC visit on the choice of health facility for childbirth in Ghana using data from the 2008 Ghana Demographic and Health Survey (GDHS, 2008). The study specifically seeks to find out whether ANC visit have an influence on the choice of a particular health facility for childbirth in Ghana. Although the utilization of antenatal care provided by health professionals is relatively high in Ghana, the utilization of childbirth care at health facilities is still low and the incidence of most maternal deaths occur during delivery due to direct obstetric complications, such as excessive bleeding and eclampsia. The Governments of Ghana have make efforts to improve maternal health care by making maternal health care more accessible and also improving service quality. Underutilizing maternal health care services, particularly the low patronage of delivery care services by women is perhaps related not only to accessibility but also acceptability and affordability since these are related to their attitudes, social influence and their self-efficacy towards maternal health care usage. Since the number of ANC visits have been found to significantly influence the choice of health facilities for childbirth in Ghana, especially in the government health facilities, there is the need to improve public awareness especially women on the health-related benefits of antenatal care services and professional assisted deliveries. There is also the need to educate women who have given birth before on the importance of delivering their babies in health institutions for each pregnancy in order to ensure their safety and that of their babies, since the results show that institutional delivery falls with the number of living children as a result of having experience with childbirth. Finally, attention should be given to females to attain up to at least the secondary school level unlike in the case of the males since the results show that women with at least secondary education are more likely to use health care facilities for childbirth services especially in the government facilities. Hence governments should implement the Free Senior High School Education Policy since this in a way will reduce the cost of attaining secondary education.

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