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## Factors that Predict Antenatal Care Service Utilization in the Upper West Region of Ghana, A Cross Sectional Study

Benjamin Baguune<sup>1,2\*</sup>, Emmanuel Bekyieriya<sup>1,2</sup>, Alexander Suuk Laar<sup>2</sup>, Sylvester Isang<sup>2</sup>

<sup>1</sup>*School of Hygiene, Environmental Health Programme, Ministry of Health, Tamale, Ghana*

<sup>2</sup>*REJ Institute, Research and ICT Consultancy Services, Ghana*

### ABSTRACT

Pregnancy is one of the most dangerous experiences that women go through in life because of the associated complications. However, in Ghana, majority of pregnant women still do not access antenatal care services. A cross-sectional survey was conducted among 489 pregnant and lactating mothers on their antenatal care services utilization. Data was collected using structured questionnaire through face-to-face interviews. Data was entered, cleaned and analyzed using SPSS version 20. In total, 88.1% of the women utilized antenatal care services. In the multivariate analysis, the following determinants were significantly associated with the likelihood of not utilizing antenatal care services (Odds Ratio (AOR) larger than 1): age of women, >35 years (AOR = 0.14, 95%CI = 0.08–0.97) compared to less than 20 years, educational level (compared to no formal education: tertiary level AOR = 0.19, 95%CI = 0.13–0.68), marital status (compared to single/never married: being married AOR = 0.23, 95%CI = 0.15–0.98), gravid (compared to primigravida: multigravida AOR = 0.37, 95%CI = 0.15–0.81) and ownership of National Health Insurance card (compared to having the card: not having the card AOR = 14.43, 95%CI = 3.04–48.33). women aged >35 years, married, tertiary level of education and multigravida were more likely to utilize antenatal care services, while women who do not have National Health Insurance cards were more likely not to utilize antenatal care services. Antenatal care service utilization rate was below the regional target of 90%. Five factors were found to be associated with antenatal care service utilization. More effort is needed to reach the disadvantaged populations with antenatal care services.

**Keywords:** Antenatal care, Utilization, Predictors, Upper West Region, Ghana.

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## INTRODUCTION

Pregnancy and delivery is one of the most dangerous experiences that women go through in life. The process is often associated with complications that often cause morbidities and mortalities [1]. Ghana is one country in which for the majority of women, the experience of pregnancy and childbirth can still in fact be equivalent to a death sentence, characterized by fear, anxiety, anguish and pain [2].

Globally, it is estimated that more than half a million women lose their lives in the process of reproduction every year of which about 99 percent are from developing countries with more than 50 percent in Sub-Saharan Africa (SSA) [1]. Ghana has had a persistently high maternal mortality ratio, estimated at 380 maternal deaths per 100,000 live births [3]. Maternal mortality is the second largest cause of female mortality in Ghana, accounting for over 14 percent of all female deaths [2, 4]. Furthermore, in Ghana, just like in most sub-Saharan Africa countries, utilization of antenatal care (ANC) services is on the ascendency, but unfortunately, majority of women still do not access antenatal care services at all or in full during pregnancy [5]. Also, despite substantial improvement in maternal health indicators in sub-Saharan Africa including Ghana, the proportion of female deaths due to pregnancy or during child birth to total female deaths from all causes is unacceptably high among rural women [2, 5].

At both global and national levels, there are different explanations for the persistence of poor maternal and newborn health outcomes [6, 7]. But prominent explanations that have recently been highlighted in literature are financial barriers and unequal access to skilled maternal and newborn healthcare services [8, 9, 10]. In most developing countries, access to health care services in rural areas is more limited than in urban areas. This issue is of particular importance to Ghana since 47 percent of its population lives in rural areas [11].

Since the adoption of the Millennium Development Goals (MGDs) in 2000 – of which goals 4 and 5 aim to improve maternal, newborn, and child health - one policy action area felt to be of particular importance to the reduction of maternal and neonatal mortality is to increase the proportion of women accessing and using skilled maternal healthcare services including ANC attendance. It is in this regard that the government of Ghana, in 2003, pioneered and is implementing a maternal healthcare policy that provides free maternity care in all healthcare facilities. Ghana's free maternal healthcare policy is premised on the notion that financial barriers are one of the most important causes of low and inequitable access to ANC and other skilled maternity care services [12]. The policy therefore aims to reduce financial barriers to access and improve access to and use of maternal care services [13].

The stall in Ghana's progress towards improving maternal and newborns health and the gaps in the continued use of ANC and other maternal care services from a skilled provider suggest

an urgent need for further research into the factors other than monetary cost that might be inhibiting access to, and use of maternal health services. Besides, there is the need to understand the other barriers to access within the rural context of Ghana towards the improvement in the utilization of ANC services. This study explored factors that inhibit women's access to and use of ANC services in rural Ghana despite these services being covered by free maternal health policy.

## MATERIALS AND METHOD

### **Study Design and setting**

A cross-sectional cluster survey was conducted in three rural districts (Wa West, Wa East and Jirapa) in the Upper West Region (UWR) of Ghana. Upper West Region is one of the poorest and least developed regions in Ghana where poverty is relatively high [14]. This Region is also noted of undesirable roads that further challenges access to health services. An estimation from the 2000 National Population and Housing census put the total population of the Jirapa district at 88,402, Wa East district at 72,074 and Wa West at 81,348 [14]. These districts are predominantly rural and majority of people are subsistence farmers living in small, scattered settlements.

### **Study participants and sampling**

The target population was women of childbearing age but the sample comprised of pregnant women and lactating mothers. The main criterion for inclusion of households was the presence of a pregnant woman and mothers with children aged 0–12 months and mothers that lived in the study sites during pregnancy and mothers who delivered within the study districts. Overall, a total of 489 interviews were completed comprising of 290 lactating mothers and 199 pregnant women. Cluster sampling method was used to conduct the study. Cluster sampling method is recommended by the World Health Organization (WHO) as a rapid, simplified and economic sampling method in the evaluation of service coverages [15]. This sampling method allowed every member of the population being studied an equal chance of being selected.

In each cluster, the first selected household was taken as the starting point for each cluster and then continued to the next nearest household until the eligible number of participants was obtained.

### **Data collection instrument and procedures**

The participants were interviewed using a structured questionnaire. The questionnaire covered respondent characteristic and ANC service utilization information. Six research assistants assisted in the data collection. Each participant had to give a signed/thumb printed consent before they were interviewed. Participants were interviewed at their homes using face-to-face interviews. The main data was collected in August, 2017.

### **Operational definitions**

**Antenatal care:** The health care services that are provided to pregnant women in the course of the pregnancy.

**Multigravida:** A pregnant woman who has had at least one previous pregnancy

**Primigravida:** A woman experiencing her first ever pregnancy.

**Trimester:** One of the three three-months into which human pregnancy is divided for medical purposes.

### **Data processing and analysis**

Data was entered and cleaned using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics such as frequencies, percentages and cross tabulations were performed. The dependent variable (ANC service utilization) was recorded as ‘utilizing ANC services’ and ‘not utilizing ANC services’. Data was imported into Stata 12.1 for bivariate and multivariate logistic regression analysis to determine predictors of not utilizing ANC services. The analysis focused on socio-demographic characteristics of respondents and ownership of National Health Insurance Scheme (NHIS) card. The multivariate analysis was performed to test associations between the dependent variable (ANC service utilization) and the independent variables as predictors (see details in Table 4). At 95% confidence interval, p-value less than 0.05 was used to determine the significant of association.

## **RESULTS AND DISCUSSION**

### **Results**

#### **Socio-demographic characteristics**

A total of 489 interviews were conducted. Respondents consisted of 290 pregnant women and 199 lactating mothers. About 32% of the respondents had no formal education. The ages of respondents ranged from 16 to 45 years. The average age of the respondents was 26.9 years. Majority of the respondents were currently married but about 6% were never married. A considerable proportion (66.2%) of the participants belonged to the Dagaare ethnic group. Christians were slightly (57.9%) more than the other religions. Over 75% of the women were multigravida. With regard to ownership of the NHIS card, over 95% of the respondents had in possession the NHIS card (Table 1).

**Table 1: Socio-demographic Characteristics of Respondents**

<b>Variable</b>		<b>Frequency</b>	<b>%</b>
<b>Age</b>	<20	83	17.0
	20-35	326	66.6
	>35	80	16.4
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>Marital status</b>	Single/Never Married	29	5.9
	Married	408	84.5
	Living together/Cohabiting	49	10.0
	Widow	3	0.6
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>Level of Education</b>	No formal Education	161	32.9
	Primary	102	20.9
	JHS/Vocational	116	23.7
	Middle School Certificate	2	0.4
	SHS	48	9.8
	Tertiary	60	12.3
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>Religion</b>	Christian	283	57.9
	Moslem	175	35.8
	Traditionalist	31	6.3
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>Gravida</b>	Primigravida	120	24.5
	Multigravida	369	75.5
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>Ethnicity</b>	Dagaari	324	66.2
	Waala	130	26.6
	Sisaala	13	2.7
	Other	22	4.5
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>Occupation</b>	Unemployed	49	10.0
	Farmer	167	34.1
	Artisan	129	26.4
	Trader	85	17.4
	Salary worker	59	12.1
	<b>Total</b>	<b>489</b>	<b>100.0</b>
<b>NHIS card ownership</b>	Yes	465	95.1
	No	24	4.9
	<b>Total</b>	<b>489</b>	<b>100</b>

### Utilization of Antenatal care services

In the survey, information on ANC visit was gathered from pregnant women on their current pregnancy and from lactating mothers on their previous pregnancy. The findings show that, even though majority utilize ANC services, almost 12% of the respondents still do not utilize ANC services (Table 2).

**Table 2: Utilization of Antenatal Care Services by Respondents**

<b>Response</b>	<b>Frequency</b>	<b>%</b>
Utilizing	431	88.1
Not utilizing	58	11.9
<b>Total</b>	<b>489</b>	<b>100.0</b>

**Time of initiating ANC services utilization**

Information was also gathered on the time of initiating ANC services from the 431 respondents who utilized the services. Regarding time of initiation, majority of the respondents initiated ANC visits in the first trimester with only about 5% initiating within the 3<sup>rd</sup> trimester (Table 3).

**Table 3: Trimester within which Respondents Started Accessing Antenatal care Services**

<b>Response</b>	<b>Frequency</b>	<b>%</b>
1 <sup>ST</sup> Trimester	310	71.9
2 <sup>ND</sup> Trimester	99	23.0
3 <sup>RD</sup> Trimester	22	5.1
<b>Total</b>	<b>431</b>	<b>100.0</b>

**Determinants of utilization of ANC services**

Table 4 shows ANC service utilization status and its potential predictors among pregnant women. Using bivariate analysis, ANC service utilization was tested with each of the potential predictors as independent variables. Then, multivariate analysis was performed controlling for all the potential predictors. In all, five factors were found as predictors of ANC services utilization in the multivariate analysis- age of woman, marital status, educational level, gravida and ownership of NHIS card. Older women were more likely to utilize ANC services, e.g. the AOR was 0.14 (95%CI 0.08–0.97) when the age of women was >35 years compared to less than 20 years. Women with tertiary educational level (AOR = 0.19, 95%CI = 0.13–0.68) were more likely to utilize ANC services compared to women with no formal education. With regards to marital status, married women (AOR = 0.23, 95%CI = 0.15–0.98) were more likely to utilize ANC services compared to single/never married women. Also in comparing multigravida women to primigravida women, it was found that, multigravida women (AOR = 0.37, 95%CI = 0.15–0.81) were more likely to utilize ANC services compared to primigravida women, and lastly, women who did not own the NHIS card were more likely not to utilize ANC services than those women who own the NHIS cards. The AOR was 14.43 (95%CI = 3.04–48.33) when those who did not own the NHIS card was compared to those who own the card. We found no association between utilization of ANC services and the remaining factors (Religious affiliation, Ethnicity and Occupational background of women). In the multivariate

analysis, women aged >35 years, married women, women with tertiary level of education and multigravida women were more likely to utilize ANC services, while women who do not have NHIS cards were more likely not to utilize ANC services (Table 4).

**Table 4: Odd Ratio (bivariate and multivariate logistic regression) of not Utilizing ANC Services**

Variable	Bivariate		Multivariate	
	Crude OR (95%CI)	p-value	Adjusted OR (95% CI)	P value
<b>Age</b>				
<20	1.0		1.0	
20-35	0.83 (0.42–1.75)	0.455	0.47 (0.16–1.29)	0.088
>35	0.35 (0.11–0.79)	0.047	0.14 (0.08–0.97)	<b>0.015</b>
<b>Marital status</b>				
Single/Never Married	1.0		1.0	
Married	0.54 (0.49–1.22)	0.227	0.23 (0.15–0.98)	<b>0.008</b>
Cohabiting	0.55 (0.47–0.99)	0.058	0.65 (0.25–1.87)	0.075
Widow	“–” <sup>a</sup>		“–” <sup>a</sup>	
<b>Level of Education</b>				
No formal Education	1.0		1.0	
Primary	0.43 (0.10–1.71)	0.347	1.35 (0.57–3.51)	0.811
JHS/Vocational	1.27 (0.58–2.14)	0.843	1.23 (0.66–3.28)	0.798
Middle School Certificate	“–” <sup>a</sup>		“–” <sup>a</sup>	
SHS	0.73 (0.32–1.65)	0.445	0.40 (0.13–1.19)	0.098
Tertiary	0.66 (0.29–1.12)	0.126	0.19 (0.13–0.68)	<b>0.003</b>
<b>Religion</b>				
Christian	1.0		1.0	
Moslem	1.18 (0.44–2.86)	0.875	0.35 (0.06–1.69)	0.182
Traditionalist	2.73 (1.22–5.59)	0.616	1.65 (0.39–7.78)	0.563
<b>Gravida</b>				
Primigravida	1.0		1.0	
Multigravida	0.50 (0.25–1.04)	0.048	0.37 (0.15–0.81)	<b>0.010</b>
<b>Ethnicity</b>				
Dagaari	1.0		1.0	
Waala	0.84 (0.39–2.29)	0.894	0.79 (0.23–2.11)	0.513
Sisaala	1.51(0.77–2.25)	0.319	1.34 (0.59–3.41)	0.416
Other*	1.24 (0.61–2.49)	0.533	0.53 (0.16–1.68)	0.382
<b>Occupation</b>				
Unemployed	1.0		1.0	
Farmer	1.04 (0.59–1.98)	0.738	0.60 (0.24–1.54)	0.281
Artisan	1.16 (0.41–3.06)	0.643	1.04 (0.32–3.65)	0.870
Trader	1.18 (0.48–2.41)	0.854	0.67 (0.23–2.01)	0.380
Salary worker	“–” <sup>a</sup>		“–” <sup>a</sup>	
<b>NHIS card ownership</b>				
Yes	1.0		1.0	
No	9.82 (1.50–17.82)	0.003	14.43 (3.04–48.33)	<b>0.002</b>

“–”<sup>a</sup>: 100% utilization of ANC services

## Discussion

The study sought to establish the extent of ANC service utilization including time of initiating access to ANC services and the most likely factors that predict utilization of ANC services. The World Health Organization's recommendation of at least four ANC visits, spaced across regular intervals, and with a skilled attendant has been proven to reduce or prevent complications during pregnancy, labour, delivery and even after delivery for both the mother and the baby [16]. The World Health Organization contends that the first antenatal care visit should occur with a skilled health attendant and as early as possible in the first trimester [1]. Evidence has shown that many of these opportunities continue to be missed because over two-thirds of pregnant women receive at least one antenatal visit or do not start early enough [17]. Our study findings show that 81.1% of the respondents utilized ANC services as against 11.9% who did not utilize ANC services for their current or previous pregnancy. This figure is below the Upper West Regional target of 90%. However, this finding is consistent with the report of 2016 annual health sector report of the Upper West Region which puts ANC services utilization by women in the three study districts (Jirapa, Wa West and Wa East) together as 79.0% [18]. Regarding time of initiating access to ANC services, even though majority of the respondents initiated ANC visits in the first trimester, we still had a considerable number of women who got pregnant and delayed until the second trimester or the third trimester before seeking ANC services. This finding also confirms the report of the 2016 annual health sector report of the Upper West Region which indicated that, the right timing for accessing ANC services by pregnant women in the region has seen a considerable improvement as many pregnant women are initiating access to ANC services in the first trimester [18]. These findings suggest that many women are reporting at the health facilities to receive ANC services as soon as they realize they are pregnant and this is likely to offer them the opportunity to benefit from the full package of the ANC services before delivery. This could be explained that, the interventions toward increasing ANC attendance rate such as health education and home visit activities are being adhered to by pregnant women in the study area.

In conducting the association analysis, five (5) factors: age of woman, marital status, educational level, gravida and ownership of NHIS card were found to be associated with ANC service utilization. In the multivariate analysis, age of woman, marital status, educational level, gravida and ownership of NHIS card were found as predictors of ANC service utilization. Women aged >35 years, married women, women with tertiary level of education and multigravida women were more likely to utilize ANC services, while women who did not have NHIS cards were more likely not to utilize ANC services.

We found an increased in maternal age corresponding with an improved utilization of ANC services. We again found that, multigravida women had a better chance of utilizing ANC

services. These patterns were observed in other studies conducted in rural Cambodia where the authors explained that, older women have better knowledge on the effect and relevance of maternal health services due to previous exposures compared to younger women [19]. In Bangladesh, a similar finding showed that maternal age is essential for uptake of maternal health services [20]. Marital status was also found to be a predictor of ANC services utilization. Married women were more likely to utilize ANC services. A potential explanation is that, married women are more likely to be psychologically stable compared to single parenting due to trauma, stigma, socioeconomic challenges and unplanned pregnancies. From the multivariate analysis, tertiary level educated women were more likely to utilize ANC services than no formal education women. Increased education is usually expected to improve health seeking behaviour positively. Our finding is similar to previous findings of secondary or higher education being a predictor of maternal service utilization [1]. In Ghana, it was found that maternal service utilization increased with increasing education of mothers [21]. In the multivariate analysis, we also found ownership of NHIS card to be a predictor of ANC service utilization. Women without NHIS cards were more likely not to utilize ANC services. Though the reason for this disparity was not explained, we think it may be due to the perceived ill-treatment that women may receive from health workers due to lack of the NHIS card. In Cambodia, a similar finding was reported that, having a health card increased chances of utilizing maternal health services [19].

## CONCLUSION

In conclusion, ANC service utilization rate was 88.1% which was a little below the regional target. The non utilization rate was 11.9%. In all, five (5) factors were found to be associated with ANC service utilization - age of woman, marital status, educational level, gravida and ownership of NHIS card. Problems of not utilizing ANC services persist and needs urgent attention. Education on ANC services should be intensified by health providers. Moreover, disadvantaged populations should continue to be reached with ANC services using out-reach programs.

### List of abbreviations

ANC:	Antenatal Care
MDGs:	Millennium Development Goals
NHIS:	National Health Insurance Scheme
NGO:	Non Governmental Organization
SPSS:	Statistical Package for Social Sciences
SSA:	Sub-Saharan Africa
UWR:	Upper West Region

WHO: World Health Organization

### **Ethic Approval and Consent to participate**

This study was reviewed and approved by the Institutional Review Board of Navrongo Health Research Center (Ethical Approval ID: NHRCIRB272). Written informed consent was obtained from each respondent prior to participating.

### **Competing interests**

The authors declare that they have no competing interests

### **Authors' contributions**

All of the authors of this study contributed to the design and implementation of this study, and to the creation of this manuscript. We have all read and approve this manuscript.

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