

**REGIONAL INSTITUTE FOR POPULATION STUDIES
(UNIVERSITY OF GHANA)**

**TIMING AND FREQUENCY OF ANTENATAL CARE UTILIZATION AND TYPE OF
PLACE OF DELIVERY IN GHANA**

BY

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ACCEPTANCE

Accepted by the College of Social Science, University of Ghana, Legon in partial fulfilment of the requirement for the degree of MA Population Studies.

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Signature **Date**



DEDICATION

This study is especially dedicated to madam Charity Amenuvor, my late parents and my future husband as well as my unborn children. Again, to my grandparents who played a major role in my upbringing.



DECLARATION

I, **Sarah Senam Nutakor**, hereby declare that the work herein presented is the result of my own investigations, and that, except for other people’s work, which have been duly acknowledged, this dissertation has never been presented to this university or elsewhere for any degree.

Candidate Signature.....

SARAH SENAM NUTAKOR

Date.....



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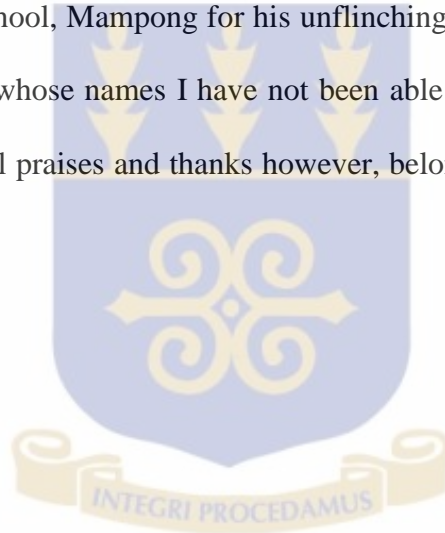
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Sarah Senam Nutakor

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ABSTRACT

High infant and maternal mortality rates are major public health concerns in developing countries including Ghana. Most of these deaths are caused by pregnancy related complications. In Ghana, about 57 percent of women in their reproductive ages had Facility Based Deliveries (GSS, 2008) as against 95 percent who received antenatal care. This is therefore not enough to achieve MDGs 4 and 5. Currently maternal mortality is estimated to be 350 death per 100 000 live births meanwhile, the MDG 5 seeks to reduce MMR of 185 deaths per 100 000 live births by the year 2015.

Use of maternal health services especially during pregnancy and delivery is an effective channel through which maternal morbidity and mortality as well as infant mortality can be reduced, especially in places where the general health status of women is poor. The focus of this study was to examine if timing and frequency of ANC utilisation enhances place of deliver. Using a secondary data from the 2008 Ghana Demographic and Health Survey, this study established that age, education, birth order, household wealth and health insurance coverage had strong influence on place of delivery. There also exist considerable variations between geographical locations of respondents and place of delivery, where rural dwellers are less likely to have Facility Based Delivery compared to their counterparts in the urban areas. The relationship between timing of ANC and place of delivery is however inconclusive and same applied to marital status and place of delivery. It again emerged from the study that women who had complete antenatal care services (OR = 4.056 CI = 1.963-8.384) were more likely to deliver at health facilities compared to those women who do not make the required number of visits as recommended by the World Health Organization. The study therefore concludes that, professionals attendants should be trained to handle rural dwellers differently; by making Facility Based Delivery more appealing to the low educated. Again, the Government of Ghana and the Ministry of Health should motivate professional staffs to accept postings to rural areas.

TABLE OF CONTENTS

ACCEPTANCE	i
DEDICATION	ii
DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT.....	v
TABLE OF CONTENTS.....	vi
CHAPTER ONE.....	1
1.1 Background of the study	1
1.2 Statement of the problem	5
1.3 Research Questions	7
1.4 Objectives.....	7
1.4.1 General objectives.....	7
1.4.2 Specific objective:.....	7
1.5 Rationale of the study	8
1.6 Organization of the study	8
1.7 Definition of key terms.	9
1.7.1 Antenatal care (ANC)	9
1.7.2 Facility Based Delivery (FBD)	9
1.7.3 Maternal Mortality Ratio (MMRatio)	9
1.7.4 Maternal Mortality Rate (MMR)	9
1.7.5 Skilled Birth Attendance.....	10
1.7.6 Infant Mortality	10
1.7.7 Importance of facility based delivery.....	10
CHAPTER TWO –LITERATURE REVIEW	11
2.0 Introduction.....	11
2.1 Frequency of ANC and place of delivery	11
2.2 Timing of antennal care and place of delivery.....	13
2.3 Marital status and place of delivery	14
2.4 Age of a mother and type place of delivery	15
2.5 Mother’s level of education and type of place of delivery.....	16
2.6 Household Wealth and type of place of delivery	17
2.7 Type of place of residence and type of place of delivery.....	18
2.8 National Health Insurance and type of place of delivery	18

2.9	Birth order and type of place of delivery	19
2.10	CONCEPTUAL FRAMEWORK	20
2.11	HYPOTHESIS	24
CHAPTER THREE		25
3.0	Research method.....	25
3.1	Sources of data.....	25
3.2	Sample Size.....	26
3.3	Measurement of variables	26
3.3.1	Dependent variables.....	26
3.3.2	Independent variables	27
3.4	Method of Analysis.....	29
3.5	Limitations	30
CHAPTER FOUR.....		32
4.0	Introduction.....	32
4.1	Place of delivery	32
4.2	Timing of antenatal care	33
4.4	Age of a mother	35
4.5	Marital status of mother	36
4.7	Place of residence of mother	37
4.8	Birth order.....	38
4.9	Household wealth or wealth quantile.....	38
4.10	Health insurance coverage	39
5.0	Introduction.....	41
5.1	Timing of antenatal care and place of delivery	41
5.2	Frequency of antenatal care and place of delivery.....	42
5.3	Age of a mother and place of delivery.....	43
5.4	Educational status of a mother and place of delivery	44
5.6	Birth order and place of delivery	46
5.7	Place of residence and place of delivery	47
5.8	Wealth index or household wealth.....	48
5.9	Health insurance coverage and place of delivery.....	49
6.0	Introduction.....	52
6.1	Impact of timing and frequency of ANC on place of delivery.....	53
6.2	Impact of the intermediate variables on place of delivery.	53

6.3	Impact of independent and intermediate variables on the dependent variables.....	55
7.0	SUMMARY, CONCLUSION AND RECOMMENDATIONS	60
7.1	Introduction.....	60
7.2	Summary	60
7.3	Conclusion	62
7.4	Recommendations.....	62

LIST OF FIGURES

Figure 2.1: A conceptual framework for timing and frequency of ANC utilization and place of delivery 23

Figure 4.1 Percentage distributions of respondents by place of delivery 33

Figure 4.2 Percentage distributions of respondents by place of residence 37

Figure 4.3 Percentage distributions of respondents by health insurance coverage..... 39

LIST OF TABLES

Table 4.1 Percentage distribution of respondent by timing of ANC	34
Table 4.2 Percentage distribution of respondents by frequency of antenatal care.....	35
Table 4.3 Percentage distribution of age of respondents	35
Table 4.4 Percentage distributions of respondents by marital status	36
Table 4.5 Percentage distributions of respondents by educational attainment	37
Table 4.6 Percentage distributions of respondents by birth order	38
Table 4.7 Percentage distributions of respondents by wealth index	38
Table 5.1 Percentage distributions between timing of ANC and place of delivery in Ghana. ..	41
Table 5.2 Percentage distributions between frequency of ANC and place of delivery in Ghana.	42
Table 5.3 Percentage distributions of relationship between age and place of delivery in Ghana.	43
Table 5.4 Percentages distribution of educational attainment of mothers by place of delivery	45
5.5 Marital status of the mother and place of delivery	45
Table 5.5 Percentages distribution of marital status by place of delivery in Ghana.....	45
Table 5.6 Percentages distribution of birth order and place of delivery in Ghana.	46
Table 5.7 Percentages distribution of place of residence and place of delivery in Ghana.	47
Table 5.8 Relationship between wealth index and place of delivery in Ghana. (in percentage)	49
Table 5.9 Relationship between health insurance coverage and place of delivery in Ghana (in percentages)	50
Table 6.1 (Model 1) Results of Binary Logistic Regression of timing and frequency of ANC utilization and place of delivery in Ghana.	53
Table 6.2 (Model 2) Results of Binary Logistic Regression of the intermediate variables and place of delivery in Ghana.	54
Table 6.3 (Model 3) Results of Binary Logistic Regression of independent and intermediate variables and place of delivery in Ghana.	58

LIST OF ABBREVIATION

ANC - Antenatal Care

FBD - Facility - Based delivery

SBA - Skilled Birth Attendant

MDGs - Millennium Development Goals

MRR - Maternal Mortality Rates

UNICEF - United Nation's Children Fund

WHO -World Health Organisation

UNDP - United Nations Development Program

NHIS - National Health Insurance Scheme

SSA - Sub-saharan Africa

CHAPTER ONE

1.1 Background of the study

In September 2000, a gathering of world leaders including the President of Ghana adopted a declaration, under the sponsorship of the United Nations, committing them to work together in the global partnership to tackle some of the most serious problems confronting humanity.

The declaration, commonly known as the Millennium Development Goals (MDGs) centered on a nexus of eight time-bound targets ranging from eradication of extreme hunger and poverty to environmental sustainability.

The MDGs 4 and 5 were developed by the United Nations as a matter of urgency to reduce infant and maternal mortality. The MDG 4 aims at reducing infant mortality to (two-thirds) while MDG 5 has twin goals: first to reduce by three – quarter between 1990 and 2015 and secondly, to achieve universal access to reproductive health by 2015.

Infant and maternal mortalities remain a huge challenge as far as the Millennium Development Goals (MDGs) 4 and 5 are concerned in Ghana.

At the global level, initiatives to intensify policy intervention for maternal mortality began with the Safe Motherhood Initiative in 1987 in response to growing recognition that primary health-care programmes in many developing countries were not adequately focused on maternal health. The 1994 International Conference on Population and Development strengthened international commitment to reproductive health. The focus on maternal mortality was sharpened when reduction in maternal mortality became one of the eight goals for development in the Millennium Declaration's Millennium Development Goal (Obaid, 2009).

Conquering infant and maternal mortality has been a global priority for more than two decades now. While some countries in sub-Saharan Africa have shown slight improvements in lowering their Maternal Mortality Rates (MMR), overall progress in reducing maternal

mortality in the region has been negligible (Starrs, 2006). Approximately more than half of all maternal deaths occur in Sub-Saharan Africa (Breen, 2011).

Globally, there was a decline in MMR from 380 to 210 deaths per 100,000 live births (a decline of about 45 %), between 1990 and 2013. Comparing the developed and the developing regions, maternal deaths between 1990 and 2013 were estimated to be 16 and 230 per 100,000 live births respectively with Sub-Sahara Africa recording 510 deaths per 100,000 live births. In 2013, about 300,000 women died as a result of pregnancy related complications. Some of these complications are: severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (pre-eclampsia), complications from delivery and unsafe abortion.

In Ghana, according to the 2010 census report, 485,000 women died as a result of giving life to another. When a woman dies in childbirth, her infant and her other children's survival are threatened. Children up to 10 years whose mothers died in childbirth are 3 to 10 times more likely to die within two years as a result of their mother's death than children living with mothers (WHO, 2014).

However, maternal mortality ratio in Ghana is currently estimated at about 350 deaths per 100,000 live births which is higher than 185 per 100,000 MDG 5 target (UNICEF). In view of this, Ghana has to put in place a number of policies to reduce maternal mortality to a minimum level. For example the Ministry of Health in collaboration with the Government of Ghana and United Nations Country Team came up with a policy called the Ghana MDG Acceleration Framework and Country Action Plan. Some of the challenges identified so far are supply of equipment, logistics, staff accommodation, midwives and nurses refusal of posting to the remote areas even though government spends lots of money training them. Other bottlenecks discovered are as follows: the NHIS does not cover the cost of conveying women in labour to the health facilities, low female illiteracy rate, poor health seeking

behaviour among the poor, and male dominance in making decisions concerning women's healthcare (UNFDP, 2014).

The prerequisite factors for achieving MDGs four and five are timely initiation of antenatal care and facility-based delivery. Regular checkups during pregnancy aid in identifying and reducing risks to both mother and child. They also give a chance to the pregnant mother to ask any questions and talk about any issues that she is unsure about such as aches and pains, the birth or any other concern. The mid-wife or doctor on the other hand also uses the opportunity to know the medical history, including information about illnesses, operations, allergic reactions to drugs, heart or kidney problems and any other issues of the pregnant woman. Finally, ANC can serve as a guarantee of a hospital birth should the need arise, as women will be registered in the health system (Myer & Harrison, 2003). The utilisation of maternal health services at appropriate times during the period of pregnancy could significantly reduce maternal mortality (Addei, 2000).

ANC is believed to reduce complications associated with delivery (Magoma et al; 2010). However, it is not enough for pregnant women to receive ANC, since majority of the fatal complications occur during or shortly after delivery (Fact Sheet ARHS, 2002). It is therefore important that pregnant women have skilled obstetric attendance during delivery. It is particularly important that all births are attended by skilled health professionals at a health facility, as timely management and treatment can make the difference between life and death. Again, it is worth mentioning that ANC alone cannot win the fight against maternal and infant mortalities.

Timely antenatal care interventions will help to reduce many of the pregnancy related problems (Jayasree et al, 1997). It is therefore important that pregnant women receive skilled

maternal health care, focusing on three main areas: improving family planning; skilled delivery and emergency obstetric; and new born care.

In the light of these, the Government of Ghana declared maternal mortality as a national emergency in 2008 in order to achieve the MDG 5. Other policy interventions are the UN Joint Public advocacy –Maternal Health & Girl Child Education, the introduction of the National Health Insurance in 2003. Another step taken in this direction is the training and posting of more nurses and midwives to health centres and Community Based Health Planning Services compounds, as a result of which there has been an improvement in maternal health related cases. These interventions helped improve skilled delivery which is facility based, with a national coverage of 52% in 2011 relative to 45.6% in 2009 and 49.5% in 2010 (GHS, 2011).

The Ministry of Health Report revealed that the proportion of women going for four or more ANC visits dropped from 73.3% to 66.3%. According to the 2012 World Health Organization (WHO) report although MMR in Ghana appears to have gone down over the past ten years (539 in 1996, 415 in 2000) (WHO & UNICEF 1996); the MMR is still high compared to other countries in Asia. ”

Again, the Ministry of Health report (2014) revealed that skilled delivery coverage was 55.3% 2013, a slight increase from 55.0% in 2012. This means a lot needs to be done to increase Facility Based delivery coverage in Ghana to achieve the 75% reduction in maternal deaths as proposed in the MDG 5. In Ghana, a total of 68% of women are estimated to have skilled delivery with rural and urban having 54% and 88% respectively (GSS, 2011).

1.2 Statement of the problem

The onset of pregnancy through to childbirth can pose unpredictable but preventable risk to both mother and child. This is why every pregnant woman must seek health care throughout the period of pregnancy and follow-up to deliver in a health facility in order to avoid all forms of complications associated with pregnancy and delivery. “Child bearing is dangerous. Ten percent of babies are born not breathing. About ten to fifteen percent of women in labour become obstructed or develop life threatening bleeding. Safe delivery requires hospitals where equipment and techniques to address those kinds of problems are available” (Gawande, 2014). This statement, made during the 2014 BBC Reith Lecture on the topic “why doctors fail”, goes to emphasise the point that Facility Based Delivery is crucial in achieving MDG 5. It is also clearer from the statement that skilled delivery and Facility Based Delivery are intertwined and should go hand in hand. Gawande went further to stress that Facility Based Delivery is when both supply and capabilities are in place and a birth skilled attendant uses them properly. On the other hand, deliveries at home, if not handled by professionals have inherent risks such as lack of proper equipment in critical cases and this can be fatal for both mother and child. The risk of infections is also higher in home deliveries compared to Facility Based Deliveries.

The alarming but preventable maternal mortality rates have been largely attributable to the fact that millions of women lack access to adequate care during pregnancy. It is estimated that over half a million women die annually due to pregnancy related complications

In order to ameliorate Maternal Mortality Ratio (MMR) in sub-Saharan Africa and Ghana for that matter, the United Nations Millennium Development Goal has identified improving maternal health care as an important target. Though maternal mortality has declined in Ghana by about 44% since 1990, the current rate of 350 deaths per 100,000 live birth is still very

high therefore Ghana is unlikely to achieve the Millennium Development Goal 5 this year 2015 (GSS 2013).

Late initiation of ANC or inadequate attendance of ANC is tantamount to poor pregnancy outcome (Kamel et al., 2013). It is not enough for a pregnant woman to initiate ANC but the frequency is also very important for safe delivery. Initiation during the first three months (first trimester) is early but any time after the first trimester is late initiation. In sub-Saharan Africa generally and also in Ghana, majority of women who attend ANC initiate it after the first trimester (late) thereby not making the minimum of four visits recommended by the World Health Organization. The WHO also recommended more than four visits for complicated pregnancies which in the long run affects their choice of place or type of delivery attendant use. Most women in sub-Saharan Africa do not make the recommended number of ANC visit (Pell, Were, Afrah, and Chatio et al; 2013).

Poor utilization of quality reproductive health service continues to contribute to maternal morbidity and mortality in developing countries Campbell (2006). In rural parts of Ghana, some women do not have access to quality health care during pregnancy due to low levels of education or better still no education, lack of a health facility, ethnicity, religion and several other reasons. At times, marital status and age of a woman are also barriers to receiving reproductive health care that every pregnant woman needs for the survival of both mother and the unborn child. Failure to receive appropriate ANC during pregnancy can lead to undesirable pregnancy outcomes such as maternal morbidity, low birth weight for the babies or even maternal or perinatal mortality. According to Wang et al; (2011), “there is a strong correlation between number of antenatal visit, having Facility Based Delivery and receiving postnatal care”.

In Ghana, a total of 68% of women are estimated to have Facility Based Delivery with rural and urban having 54% and 88% respectively (GSS, 2011).

Following from this, this study seeks to find the role of timing and frequency in relation to Facility-Based Delivery

1.3 Research Questions

The study sought to answer the following questions:

- Is there any relationship between frequency of ANC utilization and place of delivery?
- What is the relationship between timing of ANC utilization and place of delivery?
- Is there any relationship between socio-demographic and economic variables and place of delivery?

1.4 Objectives

1.4.1 General objectives

Generally, the study sought to examine the relationship between antenatal care utilization and type of place of delivery.

1.4.2 Specific objective:

- To determine the relationship between timing of first ANC and type of place of delivery.
- To determine the relationship between frequency of ANC utilization and type of delivery.
- To examine the relationship between socio-demographic and economic variables and place of delivery.

1.5 Rationale of the study

Maternal health is a crucial component of Government of Ghana policy. One of the ways to increase maternal health is to reduce maternal mortality ratio by paying much attention to antenatal care with much emphasis on timing and frequency of ANC and Facility Based Delivery. A lot of literature points to the fact that most Ghanaian women especially those in the rural setting do not still use skilled delivery although they attend ANC. Most women in sub Saharan Africa for that matter Ghana attend ANC at least once. Although 71% of pregnant women attend formal ANC at least once, only 44% attend ANC four or more times (Pell et al, 2013).

This study is timely in seeking to understand if timing and frequency of ANC enhance facility based delivery. A few studies have been done on this particular relationship in Ghana but most of these studies are usually based on socio-demographic factors associated with a woman's ability to seek health care during pregnancy.

The information obtained from this study will be useful for the country in planning, implementing and evaluating various interventions related to research findings to reduce maternal mortality ratio and help reduce maternal mortality to a minimum.

1.6 Organization of the study

The study consists of seven chapters in all. The first chapter covers of background of the study, statement of the problem and the justification of the study. In chapter two, relevant literature relating to the subject is reviewed. The chapter also includes the conceptual framework on which the variables in the study are based.

The third chapter gives a brief overview of the data set used in the study and measurement of all variables under study and questions that are asked during the collection of the data. It also discussed the methods used for the analysis of the data while chapter four analyses the

demographic characteristics of the respondents (univariate analysis). Chapter five is the bivariate level which explained the relationship between the dependent and each of the independent as well as the intermediate variables; discussion of the results would be done at this level. Chapter six covered the model- Binary Logistic Regression while chapter seven includes findings and recommendations of the findings of the study.

1.7 Definition of key terms.

1.7.1 Antenatal care (ANC)

It is used to describe the medical procedures and care that are carried out during pregnancy (Ekabua, et al; 2011). ANC serves as an opportunity to promote facility delivery.

1.7.2 Facility Based Delivery (FBD)

This refers to all births occurring in health facilities either public or private. This includes any type of building where health care is typically delivered by trained health providers, for example community health centres, clinics, regional hospitals, tertiary care centres, and where health care equipment and supplies are typically available. Akazali et al; (2011).

1.7.3 Maternal Mortality Ratio (MMRatio)

Maternal Mortality Ratio (MMR) is defined as the number of women dying due to pregnancy related causes, at delivery and within 28 days after delivery per 100, 000 live births in a given period per 100,000 live births of reproductive age during the same time period. (WHO, 2012).

1.7.4 Maternal Mortality Rate (MMR)

Maternal mortality rate is defined as the number of maternal deaths in a given time period due to maternal cause per 1, 000 women of reproductive age.

1.7.5 Skilled Birth Attendance

Bell et al; (2003) defined Skilled Birth Attendance as “The process through which a woman is provided with adequate care during labour, birth and the postpartum period, typically requiring both the presence of a skilled birth attendant and an enabling environment, including equipment, supplies, drugs and the availability of transport for referral”.

A skilled birth attendant (SBA) is a midwife, physician, obstetrician, nurse, or other health care professional who provides basic and emergency health care services to women and their new-borns during pregnancy, childbirth and the postpartum period.

1.7.6 Infant Mortality

This is defined as the probability of the death of an infant before reaching its first birthday GSS; (2008).

1.7.7 Importance of Facility Based Delivery

High-quality obstetric delivery in a health facility reduces maternal and prenatal morbidity and mortality. In attempt to reduce maternal mortality in developing countries, attention has been focused on two main interventions that have been shown to improve both infant and maternal health outcomes: training, deploying, and encouraging the use of health facility during delivery, and improving access to emergency obstetric care (EmOG) (WHO, 2004; Prata et al; 2011). Encouraging women to deliver in a health facility is one way to address both initiatives.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Care given to women during pregnancy, delivery just after giving birth and contraceptive counselling is termed maternal service. The use of these services reduces infant and maternal mortalities since skilled attendance is crucial for safe delivery (UNFPA 2010 and DHS, 2008). The benefits of these services are associated with the successes achieved by developing countries in the fight against maternal mortality where the use of skilled attendance or deliveries at health facilities brought about a reduction in maternal mortality but at a lower pace. In Ghana there has been an increase in skilled delivery from 46 percent to 57 percent from 2003 to 2008. This had risen to 65% by 2011 (GSS 2011).

In developing countries the use of maternal services varies within and between countries (Say and Raine; 2007). These disparities are due to several factors such as timing, the number of times of visits to ANC, age, educational level of the mother, place of residence, accessibility, parity and quality of care just to mention but a few.

In this chapter, I shall discuss some of these factors and how they affect the choice of type of place of delivery based on available related literature around the globe. This chapter also defined some terminologies related to the study.

2.1 Frequency of ANC and place of delivery

Frequency of antenatal care refers to the number of times a pregnant woman attends or visits ANC or how often a woman receives health care during pregnancy. It is therefore important that every pregnant woman receives ANC at least four times and more than four for complicated pregnancies as recommended by the World Health Organisation. But most women ignore this directive even in countries where there are free maternal healthcare

services like Ghana. This emphasised the fact that in sub Saharan Africa, most women are not likely to make the recommend number of ANC (Magadi et al. 2000).

According to Bloom et al (1999), women who have access to more care are four times likely to have Facility Based Delivery at birth compared to women who receive less care. This thus confirms a study by Ajiwanou and LeGrand; (2013) in four African countries: Ghana, Uganda, Kenya and Tanzania. The study confirmed that there is a positive effect of ANC on Facility Based Delivery and the effects are highly remarkable in all four counties except Tanzania.

For an effective use of ANC visit during pregnancy, several studies have identified wealth and education as mostly significant. A study by Shrestha and Shrestha; (2011) revealed that women with low educational levels, those residing in rural areas with low socio economic status were less likely to use ANC visits in Nepal. The study concurs with the findings of Kulkani and Nimbalkar (2008) that education and wealth are the most significant determinants for increasing the number of utilisation of ANC.

However, other schools of thoughts are of view that quality of care is rather significant. For instance study by Bloom et al (1999) revealed that there is a strong positive association between level of care obtained during ANC visit and the use of Facility Based Delivery. Again, a study by Iyaniwura and Yussuf, (2009), established that perceived quality of service was the most important factor which influenced the choice of facility for obstetric care. Finally, ANC can serve as a platform for a hospital birth should the need arise because women use the opportunity to register in the health system (Myer and Harrison, 2003).

According to Stephenson et al. (2008) as well as Magadi et al (2000) frequency of ANC visits is a strong predictor of delivery attended by a skilled attendant in a health facility except studies that did not look at the variable at all (Aremu et al, 2011 and Babalola et al, (2009). Despite all these revelations and links between frequency of ANC and Facility Based

Delivery, a study by Adadow Yidana et al; (2014) revealed that women who attend ANC three or four times are more likely to deliver at home than women who attend ANC only once or twice. The reason alluded to this is that, the women who made four or more visits feel convinced that attending ANC thrice without any warning signs means that they have no complications and can therefore deliver at home with less difficulty relative to those who attended once. This result appeared to be consistent with the study of Akazili et al; (2011) in rural Northern Ghana. These two studies defuse the argument that a higher frequency of ANC is necessarily followed by Facility Based delivery. It also confirms why there were higher records of ANC attendance but lower FBDs.

2.2 Timing of antenatal care and place of delivery

A visit to ANC by a woman during the first three months (first trimester) of pregnancy is termed early initiation while a visit anytime beyond this time is termed late initiation. In sub-Saharan Africa, despite the widespread availability of ANC services most women are likely to initiate first ANC late and some do not return for follow-ups at all. A study by Wang et al; (2011) revealed that majority of women receive antenatal care during pregnancy even though most of these visits are done after the first three months. While Ghanaian women do well in reporting in the first three months (57 percent) in contrast, it was established that in Malawi even though 95 percent of women reported for ANC only close to 10 percent reported in the first trimester. This may be so because education on the importance of early initiation of first antenatal care is not clear though they however know that they must attend. Late ANC initiation has been associated with poor pregnancy outcomes such as prematurity and low birth weights (Heaman 2008).

A study (Rhoune et al. 2003) in Kenya among young women revealed a significant relationship between timing of first ANC and Facility Based Delivery. It was established that

early timing of ANC precipitates health facility delivery in a health facility since SBAs are only found in a health facility. This is in agreement with the findings of Magadi et al. in their 1999 study.

Timing of first pregnancy and ANC utilization also proved to have a positive significance on Facility Based Delivery (Ochako et al. 2011).

2.3 Marital status and place of delivery

The basic factor that exposes women to the risk of pregnancy is marriage and so it is vital for the understanding of the concept of fertility. However, in SSA countries like Ghana, ability of a woman to get pregnant is not necessarily a matter of marriage since some women get pregnant outside union (DHS 2008).

Marital status according to Breen; (2011) a study in Zambia showed a positive impact on access to skilled health care. It was established that married women are more likely to deliver at a health facility compared to unmarried women. Similarly, unmarried women in Kenya, who started childbearing before 20 years of age, had fewer antenatal visits than married women who started at a later age (Magadi et al. 2000. Similarly, (Mpembeni et al; 2007) established that single women were more likely to deliver at a health facility compared to their counterparts who are married. The proportion of single women who delivered at a health facility is 57.2 percent against 42.8 percent who were married. Single women with high socio economic background are able to make informed decisions about their health compared to their counterparts who are married but might belong to low socio economic background. While some other studies established statistical significant relationship between marital status and place of delivery, Stephenson et al; (2006) found no statistical significant relationship between the two variables.

This concludes that marital status alone does not in itself guarantee ability to seek health care but it is linked to other variables like maternal education and income.

2.4 Age of a mother and type place of delivery

Age refers to women in their reproductive ages 15-49. Comparing the two extremes of age categories, MMR is higher for women between 45-49 relative to women 15-19 irrespective of type of place of residence (990.4 and 565.7) respectively (GSS, 2010). Magadi et al; (1999) found out in their study that younger women are more likely to use facility delivery while Rhoune et al; (2003) have a contrary view. Based on their study, they disclosed that younger women giving birth for the first time in Kenya are more likely to use facility delivery considering themselves to be at a higher risk as compared to their older counterparts who have undergone the process once or more and therefore have much experience even though the study did not look at women as a whole. The findings of Magadi's study is a true representation of age and Facility Based Delivery since the study covered the whole of sub Saharan Africa, that older women do prefer attending ANC during pregnancy hence the type of place of delivery during delivery. Other researches argue that adolescents shy away from receiving ANC due to the age at which they got pregnant which finally has effect on the type of place of delivery. According to the 2006 Multiple Cluster Indicator Survey (MICS) report on Ghana, both adolescents and women between ages 40-44 are less likely to have ANC during pregnancy provided by a health professional unlike their counterpart ages 45-49 years. While most researchers found a statistical significance between maternal age and FBD (Hong et al 2011 Magadi 2000; Letamo et al, 2003; Babalola et al, 2009; Aremu et al, 2011) and the study of Smith Sulzbach; (2008) did not find any relationship.

2.5 Mother's level of education and type of place of delivery

Education is one of the factors that are likely to influence whether a woman will be helped by a skilled professional or not. Women with higher education at least to a secondary level are more likely to be assisted by skilled attendants in a health facility than women who schooled to the primary level or have no education at all (GSS,GHS and ICF Macro, 2008). A study conducted in Nepal showed that there is a relationship between education and place of delivery; as those with poor education are more likely to deliver at home compared to educated women who tend to deliver at health facilities (Stephenson et al 2006). Again, a study from Cambodia noted that women who attend at least seven years of school (basic education) are six times more likely to deliver in health facilities compared to those who did not attend (Yanagasawa et al 2006). In contrast, better awareness of poor quality in many facilities and higher confidence in self-care may delay care seeking among educated women. Education is likely to be associated with wealth and even residence. (Bolam et al 2006).

A study by Daniels (2013) among rural Ghanaian women using Akwapim North District as a case study did not establish any relationship between mother's education and facility delivery. It states that education of a mother did not have any significant effect on skilled assistance at delivery. This may be due to the inability of women to access vehicles to a health facility and getting assistance from skilled personnel. Most women in the sample did not attain high levels of education at least to the secondary level.

Several studies have established that level of education is strongly associated with delivery in health facilities where by more educated women tend to deliver in health facilities compared to non-educated. (Mekonnen and Mekonnen et al., 2003; Aremu et al., 2011; Babalola andFatusi, 2009; Bazant et al., 2009; Fotso et al., 2008; Addai, 2000 and Ahmed et al., 2010) .

Overbosch et al. (2004) concluded that, in Ghana “Women’s attitude to antenatal care seems to be influenced by their schooling, since more years of education of a pregnant woman is associated with a choice for sufficient antenatal care”. Therefore increased enrolment of girls to secondary education and above could help to improve delivery in health facility.

2.6 Household Wealth and type of place of delivery

Household wealth has been identified in several studies to have both positive and negative effects on the type of place of delivery and the kind of assistance a woman would receive at delivery; that is whether a woman would deliver at a health facility or at home. The (GSS; 2008) identified poverty as one of the topmost problems that prevents women from accessing facility care during delivery. The survey indicated that births to women within the poorest wealth quintile were three times less access to facility delivery relative to their richest counterparts.

Ortiz (2007) cited in Authur (2012) revealed that affluent women have more chance of delivering in a health facility compared to the impoverished women while Authur’s study in Ghana using the 2008 DHS which aims to verify if wealth still has effect on SBA with the introduction of NHIS; the result was also positive. This means that the introduction of free maternal services does not totally rule out the effect of wealth on SBA in Ghana. The study agrees with Mayhew et al (2008) that, financial barriers are reasons why women do not use skilled attendance at delivery in Afghanistan. From a comparative study in four regions by Wang et al (2011), it is evident that there is a strong relationship between household wealth and use of skilled birth care at delivery. However, it was also discovered that several countries in sub-Saharan Africa Namibia, Benin, Zimbabwe, Malawi, Rwanda and Vietnam in Southeast Asia, on average women still deliver at a health facility even among women in the poorest wealth quintile. More than 40 percent of women in these countries that fall in the

poorest group use skilled delivery care. The common users of skilled birth care are women who belong to the wealthiest group in almost all the countries studied in SSA with 90 percent of women in the wealthiest group having skilled birth assistance.

2.7 Type of place of residence and type of place of delivery

Disparities exist in rural and urban settings due to accessibility and availability of health facilities. These disparities put rural dwellers at a great disadvantage including the women who need the services of a skilled professional at during pregnancy and at delivery in contrast to their urban counterparts who have at their disposal quality health facilities both public and private. Gabrysch and Campbell; (2009) asserted that these disparities may be due to differences in infrastructure, health facility economic and cultural factors. Comparing the urban and the rural woman, the former is more likely to use skilled attendance at birth. Many studies have confirmed this assertion. Babalola et al.2009, Hong et al. 2011, Letamo et al. 2003, Magadi et al; 2000. According to GSS; (2008), in 2008 only 43 percent of rural women had skilled attendants at their birth, while 84 percent of births to urban women were attended by skilled health personnel. A couple of studies however did not find any link between place of residence and facility based Delivery (Aremu et al. 2011,Smith Sulzbach 2008, Stephenson et al. 2006).

2.8 National Health Insurance and type of place of delivery

Health care user fee is one of the proximate determinants to utilisation of skilled delivery services. In resource poor communities, the cost of user fees at deliveries limits access to skilled attendance and contributes to both neonatal and maternal mortality in especially poor households (Witter et al;2007).

In September 2003, the Government of Ghana introduced the National Health Insurance policy to ameliorate the burden of cash and carry in seeking health care and most importantly to exempt women from delivery fees in both public and private facilities. The policy first took off in four deprived regions of Ghana and then expanded to the remaining six regions in April 2005 (USAID, 2009). With this policy in place, it is expected that women will seek health care from professionals and use skilled delivery but this is not always the case. According to Authur; (2012) insured women were more likely to attend at least four visits hence seek SBA (88 percent) as against (73percent) non-insured. Contrary to that finding, a qualitative study by Ngula; (2005) in two rural clinics of Okakarara district in Namibia which sought the views of women on the benefits of delivery at a health facility and skilled delivery revealed that, pregnant women knew about the benefits of NHIS on skilled delivery but complained about socio economic, cultural and service related factors that makes it difficult for them to use the services. Documented research suggest that, even though the women know all the benefits associated with Facility Based Delivery, they still prefer to deliver with TBAs which they said are more tolerable, caring and supportive (Moore et al 2002; Geuts,1997).

2.9 Birth order and type of place of delivery

Birth order is simply the rank of siblings by age. According to Overbosch et al; (2004), “Pregnancy is a natural process and women with delivery experiences might consider antenatal care less necessary”. In study by Wang et al; (2011) in 38 countries using the DHS, it was discovered that birth order has an inverse relationship with the use of FBD. Consistently across all the four regions in the study, the proportion of births delivered in health facility declines with birth order. A large proportion of women with one birth were attended by SBAs in a health facility as compared to women with more than four births.

While many established that birth order has an association with FBA or SBA some other studies did not find any relationship between birth order and facility delivery: (Hong et al, 2011; Avenu et al,2011; Letamo et al, 2003; Magadi et al, 2000; Stepheson et al, 2006), (Babalola et al, 2009;Smith Sulzbach 2008 in Mali and Ghana) respectively.

2.10 CONCEPTUAL FRAMEWORK

This framework in figure 1.1 is the modified version of the Anderson's Health Seeking Behavioural Model (2005) and it is ideal for explaining timing and frequency of ANC utilization and type of place of delivery, that is a health facility or outside (home). The model has been grouped under headings that predict the use of health facility; these are socio-demographic and enabling factors, (marital status of a mother, age of a mother, educational attainment of a mother, parity and birth order of a mother, place of residence of a mother) and enabling factors (household wealth and insurance coverage) and perceived benefits.

Individual characteristics determine how two individuals will use health care services; that is, those characteristics that exist prior to the onset of specific episode of illness Anderson and Newman; (2005). People with certain attributes are more likely to patronise health care services although these attributes are directly responsible the use for health care services.

A woman's marital status is another important factor that affects utilization of ANC and place of delivery. There is enough fact to show that married women are more likely to use health facility during delivery relative to non-married women.

There is again enough empirical evidence to show that more education is connected to the tendency to seek and use better antenatal and delivery care services. Education also has an association with household wealth; it is argued that, the more educated a person is the more wealth they acquire relative to those with less education or those without any form of education; education is thus an important premise for health care use especially seeking ANC

care and facility delivery as well as the use of Skilled Birth Attendants who are only located in the premises of the facility be it a public or private facility.

Place of residence, parity and birth order have all been recognised as predisposing factors in antenatal and delivery care utilization.

Considering all these elements that influences ANC and delivery care utilization, there are other elements that serve as a bridge between the factors mentioned above and ANC utilization and the type of place of delivery. Anderson and Newman (2005) referred to these factors as enabling factors. Enabling conditions can be measured by family resources such as income or wealth, level of health insurance coverage, perceived benefits used as intermediary variables.

Household wealth tends to influence the use or non-use of health services even if the person is covered by a health insurance. Empirically, available studies indicate that wealth or income is positively associated with the use of formal health services including antenatal and delivery care.

Similarly, the extent of health insurance coverage which addresses partly financial accessibility issues particularly out of pocket settlement at the point of service determines health care utilisation. Evidence abound to the effect that when women are health insured they are more likely to use antenatal and delivery care services than non-insured women.

Better comprehension of foetal growth and development and its relationship with the mother's health has resulted in increased attention to the potential of antenatal care as an intervention to improve both maternal and neonatal health.

Figure 2.1: Andersen and Newman Framework of Health Services Utilization

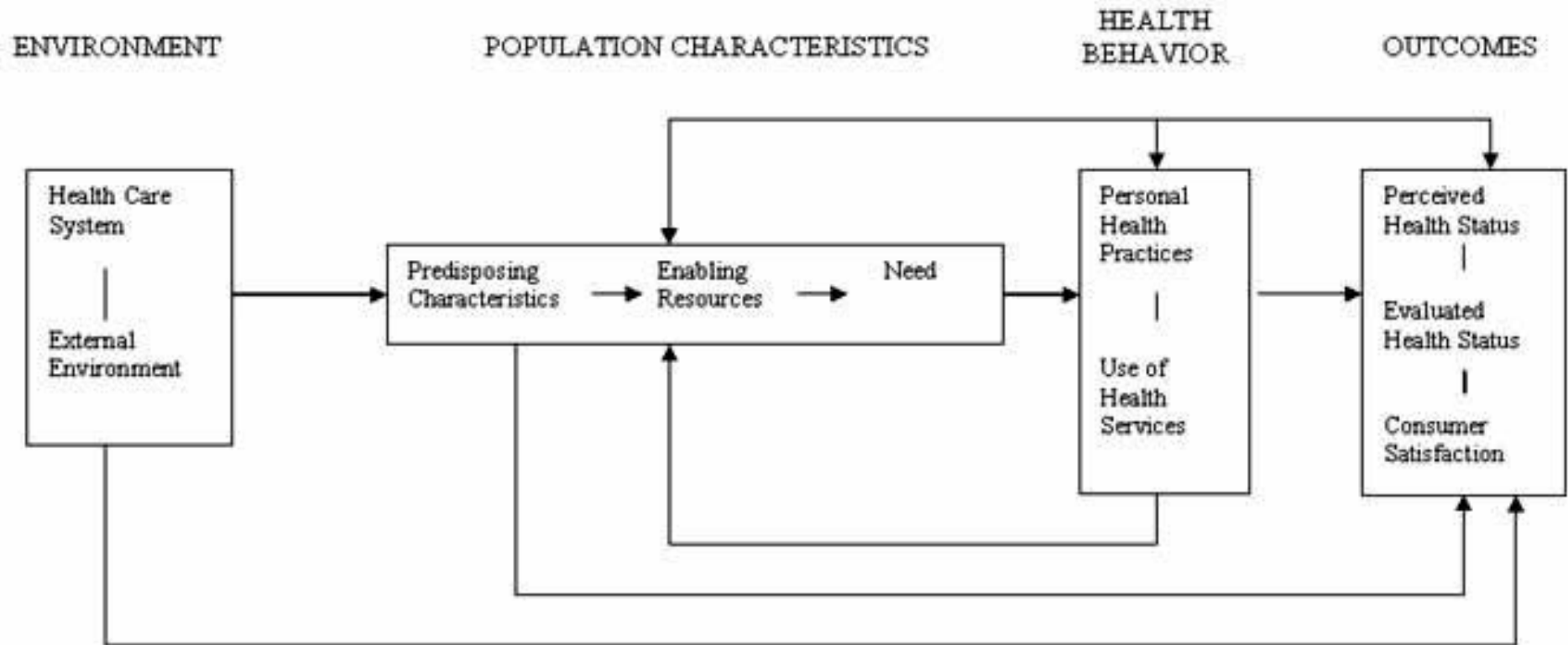
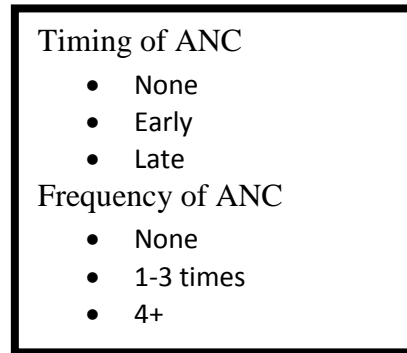
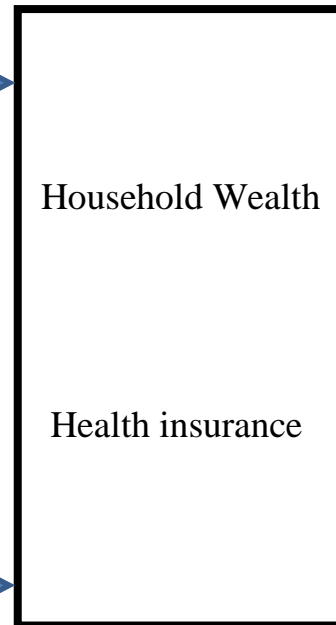
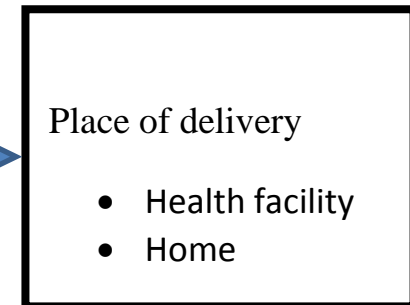
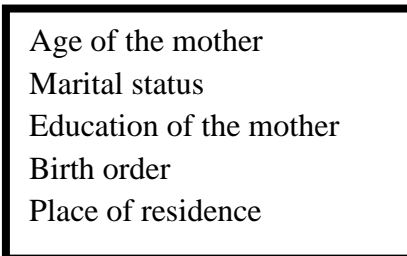


Figure 2.2: A conceptual framework for timing and frequency of ANC utilization and place of delivery

INDEPENDENT VARIABLE**INTERMEDIATE VARIABLES****DEPENDENT VARIABLES****CONTROL VARIABLES**

Andersen's Modified Health Seeking Behavioural model (2005)

2.11 HYPOTHESIS

The following statements have been hypothesized for the study to guide in drawing conclusions.

- Women who attend antenatal care sessions early are more likely to deliver at a health facility as compared to women who do not attend antenatal care sessions.
- Women who attend four or more antenatal care sessions are more likely to deliver at health facility compared to women who do not attend antenatal care sessions.
- Currently married women are more likely to deliver at health facility compared to never married women.

In conclusion, this section of the study highlights available knowledge in the study and how this current research intends to add to existing knowledge using the modified conceptual framework as a brain for the analysis.

CHAPTER THREE

METHODOLOGY

3.0 Research method

This chapter will give a brief preview of the data set used and explain the outcome variables and the explanatory variables of the study. In addition, the chapter will briefly outline the intended method to be used for the analysis of the data and the organization of plan of the various chapters would also be outlined.

3.1 Sources of data

The data for this study was derived from the 2008 Ghana Demographic and Health Surveys (GDHS). The objective of the 2008 GDHS is to provide data to monitor the population and health situation in Ghana, for instance fertility and mortality. These data were collected from all the ten regions of Ghana to ensure a nationwide representativeness. The survey is carried out every five years. In Ghana, the study was carried out in (1988, 1993, 1998, 2003 and in 2008). A special survey on maternal health was carried out in 2007. The sample contains women within the ages of 15-49 with a live birth in the five years preceding the survey. The questionnaire consists of questions on demographic indicators, health status, illnesses, and visits to a doctor, health behaviour such as questions on smoking, drinking alcohol, physical activity, and eating habits.

To measure demand for ANC, the number of visits to a modern health facility namely public/government hospitals, mission hospitals and private hospitals is used. This has however been ordered according to the WHO protocol of a minimum of four visits before delivery, which is seen as sufficient to ensure safe delivery. Further visits are however recommended when any complications are detected by the physician. The cost of ANC is not

included in the estimation equations, because ANC services are provided free of charge in all public hospitals, and some private and religious hospitals for all pregnant women in Ghana. The data were also subjected to quality control test through pre-testing, training and actual field work. The processing of the GDHS results began shortly after the fieldwork commenced. Completed questionnaires were returned periodically from the field to GSS in Accra, where they were entered using CSPro, a programme especially developed for using in DHS survey. All data were entered twice for a (100 percent verification). The concurrent processing of the data was a distinct advantage for the data quality because GSS had the opportunity to advise field teams of problems detected during data entry. These rigorous processes added to the quality of the data and make it suitable for the current study.

3.2 Sample Size

In all, 2099 women within the ages 15-49 were used as the sample size which was drawn from the women's file. The sample was conducted on the data adjusted by sample weight to account for the stratified sampling design for representativeness. This was then filtered to get the correct sample for this study which includes all missing values and women who did not use ANC and did not have facility based delivery. This is because the main goal of this study is to examine the relationship between timing and frequency antenatal care utilization and place of delivery.

3.3 Measurement of variables

3.3.1 Dependent variables

The dependent variable in this study is type of place of delivery which is divided into two (health facility or Facility Based Delivery and delivery at home). This makes the dependent

variable dichotomous in nature. The assumption is that deliveries that occur in health facilities are skilled attended compared to those delivered in homes. This was ascertained by responses to the question “where did you give birth”? Based on these questions, places of birth of the respondents were recorded and coded. For the purposes of this study these responses to type of place of delivery was categorized into home delivery and health facility delivery. However, there are some few cases where home deliveries are attended to by skilled attendants. For example, some women who have personal doctors and would not want to go to the health facility for one reason or the other.

3.3.2 Independent variables

The independent variables are basically two variables: Timing and Frequency of ANC attendance. These will be tested against the dependent variable, together with some control variables, in order to account for some foreseen confounding factors like age and education of mother. It is also foreseen that some proximate factors like wealth and access to benefits of the health insurance scheme can have direct impact on choice of place of delivery. These two intermediate variables would be used to mediate the independent and dependent variables.

- I. The World Health Organization (WHO) recommends that for the majority of normal pregnancies, ANC should consist of at least four visits during the course of the pregnancy, the first of which should occur within the first trimester. Timing of first ANC visit was thus recoded as “none” for women who did not initiate ANC at all, “early “ when it occurred during the first trimester and “Late” when the visit took place during the second or third trimester.

- II. Frequency of ANC is categorized for the purpose of this study as None (0), (1-3) and (4-11) visits. In the GDHS respondents were asked about how many times they had received antenatal care for their most recent births in the five years preceding the survey. Under normal circumstances, the World Health Organisation (WHO) recommends that a woman without complications have at least four antenatal care visits, the first of which should take place during the first trimester.
- III. From the data collected, the respondent's age was recorded against the questions "in what month and year were you born?" the latter was chosen and used. The ages were then categorized as: respondents aged 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, and 45-49 years old. Since the study is about women in their reproductive ages, this categorization has been maintained for a better analysis.
- IV. "What is your current marital status?" This question was asked the respondents to ascertain whether a particular respondent is currently married or not married. The responses were recorded as "married or living together", "never married" and "never lived together". For the purposes of this study, these classifications are categorized into two groups. These are "currently married" and "currently not married".
- V. Educational levels of the respondents considered relevant were the educational attainment and literacy level. Educational attainment was measured by the level of school completed by the respondents and had the following response categories: "no education" "incomplete primary", "complete primary", "incomplete complete", "secondary" and "higher". These categories were regrouped and coded in the following: no education, primary, secondary and higher.

- VI. Type of place of residence was coded as the rural or urban DHS and this would be maintained for the study.

3.3.3 Intermediate variables

- I. Wealth index (intermediary variable) has been divided into five quintiles in the data set; the lowest quintile (poorest), 2nd quintile (poorer), 3rd quintile (middle), 4th quintile (wealthier) and the 5th quintile (wealthiest). The variables that were included in the calculation of the index include: ownership of house- whether the house is owned by the household head or rented, whether there is electricity in the house or not, source of drinking water- pipe borne or well, ownership of a car, the type of cooking fuel used firewood or others, location of kitchen- whether indoors or outside and the number of rooms in the house. However for the purposes of this study, wealth has been grouped as follows: (poor, middle and rich).
- II. The second intermediate variable is health insurance coverage. Women were asked whether they were covered by a Health Insurance Scheme; with options of 0=No and 1=Yes. A dummy variable was created to maintain the original coding [0= No; 1=Yes].

3.4 Method of Analysis

The study employs both univariate, bivariate and multivariate analysis to investigate the effect of timing and frequency of ANC and other socio-demographic variables on place of delivery use in Ghana.

3.4.1 Univariate analysis

The univariate analysis: Percentages, tables and figures. The univariate analysis was conducted for the purpose of describing the background characteristics of the mother. Tabulation of each independent variable resulted in an output of frequencies and percentages of the characteristic of the mother in the study area. This is the method of summarizing the variables used in the study.

3.4.2 Bivariate analysis: Cross tabulations and chi square

The bivariate analysis is the second level of analysis which was under taken in the study. This was performed on each independent and biological variable against the dependent variable.

This then indicated the extent to which each variable was associated with each other. Pearson Chi-square test was at 5 % confidence level. This test, reports Chi square value, indicating the nature of relationship between each independent variable and dependent variable.

3.4.3 Multivariate analysis: binary logistic regression.

The third stage of the analysis was the multivariate logistic regression test. There would be three different models at this level: model one would look at the impact of the main independent variables (timing and frequency of ANC) on place of delivery, the second one would also look at the impact of the intermediate variables on the dependent variable and the final model would include all the independent and intermediate variable against the dependent variable. This was done to determine the extent to which all the background variables have an impact on the dependent variable at the different levels.

3.5 Limitations

During surveys such as the DHS, there are technical problems associated with the information on timing and frequency and place of delivery since the data collected was a cross sectional.

The third limitation is that some of the observed covariates relating to the characteristics of the woman refer to the time of the survey but not the time when a particular birth took place. The relationships should not therefore be considered causal but rather mere associations. These limitations notwithstanding the study provide results that are relevant for future research and policy as indicated in the conclusion.

CHAPTER FOUR

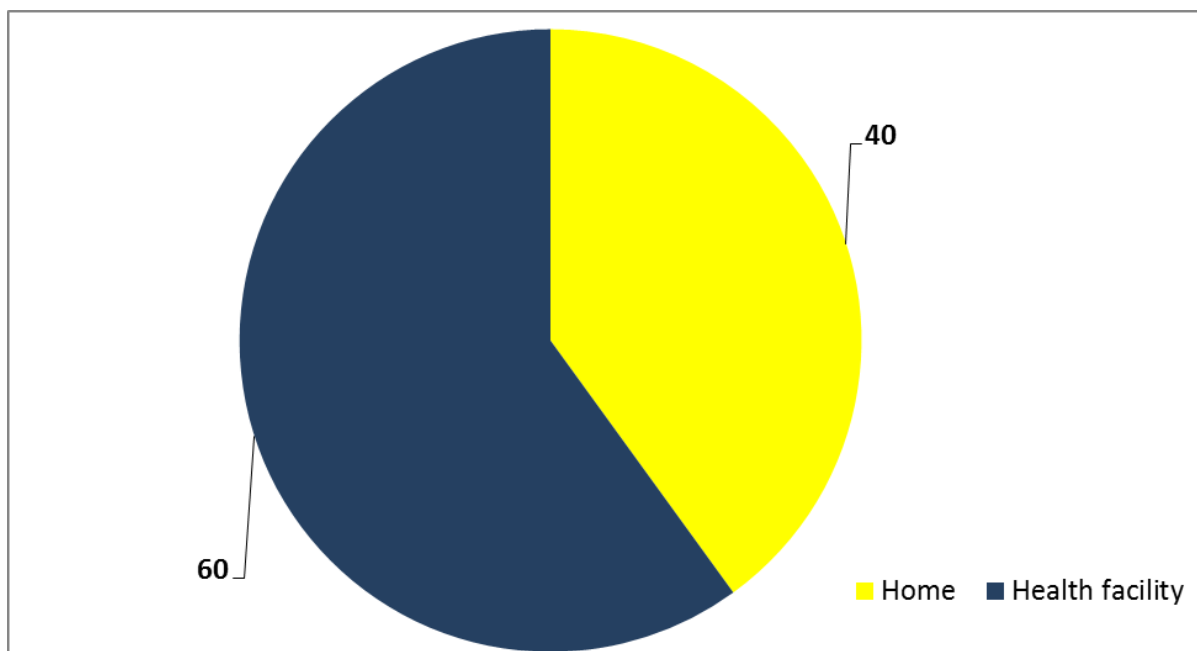
SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

4.0 Introduction

This section is based primarily on data analysed from the 2008 Ghana Demographic Health Survey. The chapter provides a description of the socio-demographic profile of the survey respondents as contained in the data. The basic information of the sample respondents is critical for the interpretation of the findings within the context of this study, which seeks to investigate the timing and frequency of ANC utilization and type of place of delivery in Ghana. The main variables described in details that are used in the subsequent chapters dealing with the bivariate and multiple regression analyses are: timing of ANC and frequency of ANC. Other independent variables serving as control are: age of a mother at the time of the survey, marital status, and educational attainment of the mother, place of residence and birth order. This chapter also includes information on two intermediate variables: wealth quintile and insurance coverage.

4.1 Place of delivery

Place of delivery refers to where a woman had her last child preceding the survey. The study sought to look at whether women are delivering in homes or at health facilities. From figure 4.1 above, sixty percent of deliveries took place at health facilities compared to forty percent that occurred in home. Even though this is good it is not encouraging enough to meet MDGs 4 and 5.

Figure 4.1 Percentage distributions of respondents by place of delivery

Source: *Generated from the Ghana Demographic and Health Survey 2008*

4.2 Timing of antenatal care

It is very important that pregnant women initiate their first ANC in the first trimester as recommended by the World Health Organisation. This is to allow sufficient time to enable early detection of problems like anaemia and infections.

From the table 4.1, more pregnant women in Ghana initiate antenatal care early according to the classification of this study compared to late initiators, which is 55.4 percent against 41.1 percent. About 4 percent did not either initiate early or late, this could be due to the fact that these women did not attend ANC at all.

Table 4.1 Percentage distribution of respondent by timing of ANC

Timing of ANC	Frequency	Percentage
No visits	72	3.5
Early initiation	1164	55.4
Late initiation	863	41.1
Total	2099	100.0

Source: *Generated from the Ghana Demographic and Health Survey 2008*

It is also clear from the data that there is an improvement in early initiation of ANC in Ghana compared to other countries in sub-Saharan Africa. It was clear from the study that 57percent women who reported to ANC did so in their first trimester.

4.3 Frequency of ANC

Higher frequency of antenatal care attendance is necessary for pregnant women throughout the period of pregnancy. Pregnant women who attend ANC more than four times are very likely to have facility based delivery relative to those that have only one visit or no visit at all. Indicated in table 4.2 most (78.2 percent) Ghanaian women at make at least four or more visits per the recommendation of the World Health Organisation. However, at least 3.7 percent of Ghanaian women did not attend ANC during pregnancy.

Table 4.2 Percentage distribution of respondents by frequency of antenatal care

Frequency of ANC	Frequency	Percentage
No visits	79	3.7
1-3	380	18.1
4/ more	1640	78.2
Total	2099	100.0

Source: *Generated from the Ghana Demographic and Health Survey 2008*

4.4 Age of a mother

Averagely, the respondent age in this study is 29 years. The univariate result shows that a quarter of the respondents are within ages 25-29 representing 26.3 percent and the least age category as 44-49 representing 3.7 percent. The results shown in table 4.3 revealed that the proportion of respondents above age twenty four decreases as age increases which reflects the youthful age structure of the nation. Again the 2010 Population and Housing Census and the 2008 Demographic Health Survey confirm this finding.

Table 4.3 Percentage distribution of age of respondents

Age 5-year groups		
Age	Frequency	Percent
15-19	100	4.8
20-24	405	19.3
25-29	552	26.3
30-34	430	20.5
35-39	361	17.2
40-44	173	8.3
45-49	78	3.7
Total	2099	100.0

Source: *Generated from the Ghana Demographic and Health Survey 2008*

4.5 Marital status of mother

Table 4.4 below showed that majority of the respondents in the study are currently married - 87.5 percent. Never married and formerly married women are only 6.1 percent and 6.3 percent respectively. This is an indication that Ghanaian women are likely to marry early and it also confirms the finding of the 2008 DHS that women are more likely to marry earlier than men.

Table 4.4 Percentage distributions of respondents by marital status

Marital status	Frequency	Percentage
Never married	129	6.1
Currently married	1837	87.5
Formerly married	133	6.3
Total	2099	100.0

Source: *Generated from the Ghana Demographic and Health Survey*

4.6 Educational attainment of a mother

In the figure above, 42.4 percent of respondents had at least a secondary education followed by 30.9 percent who had without any education. Women in the sample are less likely to attained higher education. Education provides the requisite knowledge and skills for a better understanding of the concept of maternal health. Women education comes with a lot of benefits like good nutrition, proper care for children and health facility delivery just to mention a few.

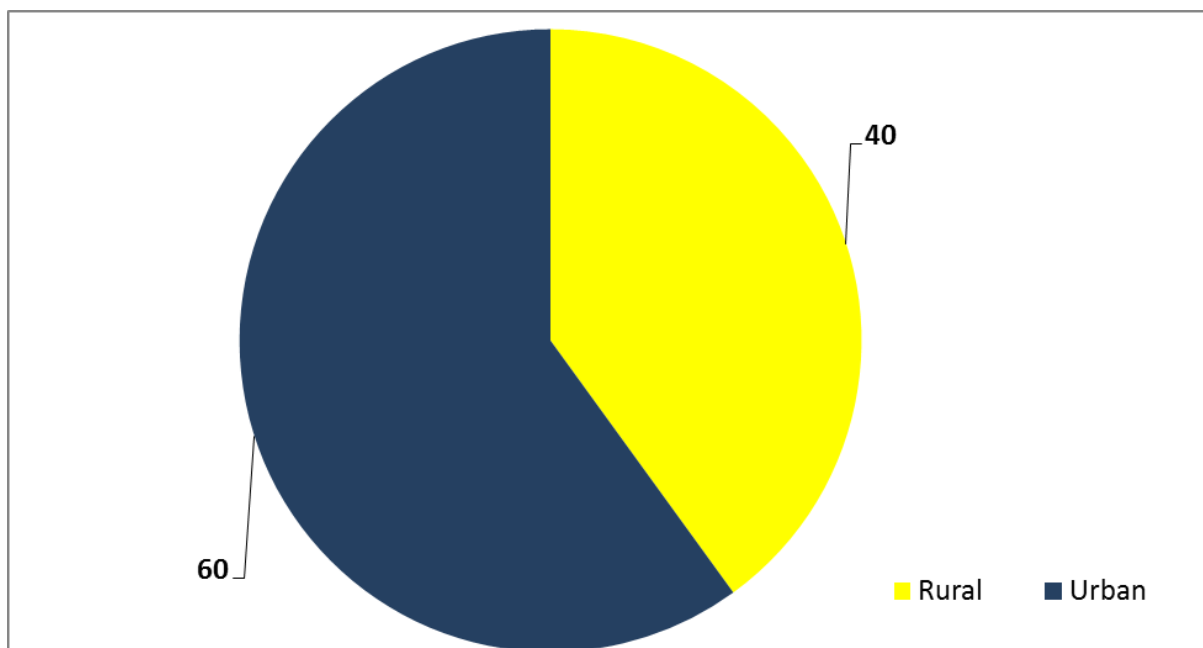
Table 4.5 Percentage distributions of respondents by educational attainment

Educational attainment	Frequency	Percentage
No education	648	30.9
Primary	511	24.3
Secondary	890	42.4
Higher	49	2.3
Total	2099	100.0

Source: *Generated from the Ghana Demographic and Health Survey 2008*

4.7 Place of residence of mother

Place of residence of the respondent in the study is classified as rural or urban. In figure 4.2 sixty percent of the women in the sample are rural dwellers and the rest are urban dwellers. Place of residence of a mother plays a very critical role in the woman's ability to deliver at a health facility or not. There exist disparities between place of residence in terms of health facility availability and accessibility.

Figure 4.2 Percentage distributions of respondents by place of residence

Source: *Generated from the Ghana Demographic and Health Survey 2008*

4.8 Birth order

Birth order tells the order in which children are born. It is assumed that first births get more attention than the subsequent ones.

Table 4.6 Percentage distributions of respondents by birth order

Birth order	Frequency	Percentages
1 st	467	22.3
2 nd -3 rd	786	37.4
4 th -5 th	498	23.7
6/more	348	16.6
Total	2099	100.0

Source: *Generated from the Ghana Demographic and Health Survey 2008*

While a mother giving birth for the first time would like to deliver at a health facility, the same mother delivering her sixth child might feel reluctant to have facility based delivery.

Again, birth order can affect the wealth of a mother to reduce or increase. From the table 4.6, respondents who were having their sixth child at the time of the survey were only 16.6 percent compared to 22.3 percent those having their first child.

4.9 Household wealth or wealth quantile

Another variable under consideration in this study is household wealth of the respondents.

Table 4.7 Percentage distributions of respondents by wealth index

Wealth index	Frequency	Percentage
Poorest	480	22.9
Poorer	461	22.0
Rich	400	19.1
Richer	436	20.8
Richest	322	15.3
Total	2099	100.0

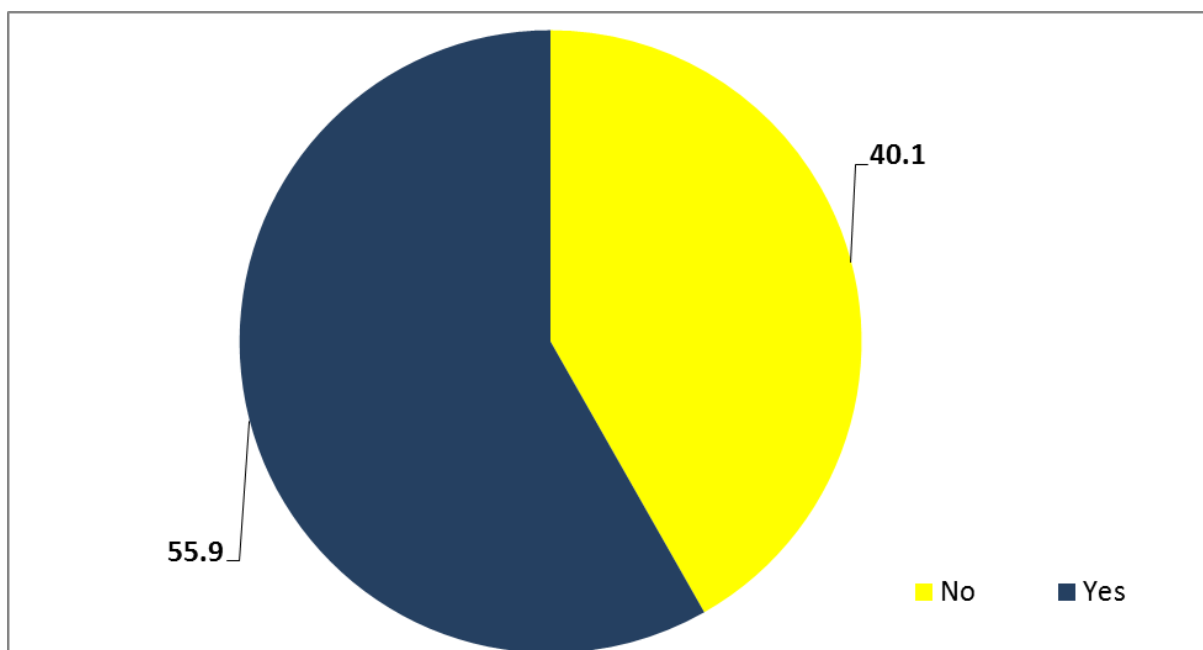
Source: *Generated from the Ghana Demographic and Health Survey 2008*

The results indicate that less than a quarter of the women in the study fall within the poorest wealth quintile (22.9 percent) as against those in the richest wealth quintile (15.3 percent). There is not much difference between the poorest and the poorer wealth quintiles hence almost half of the respondents fall below the lower half of the wealth quintile as indicated by the GDHS 2008.

4.10 Health insurance coverage

The variable Health Insurance Coverage of the respondent was considered as an intermediate variable in the use in the study. This in conformity to the 2003 Health Insurance Scheme (Act 650) with the aim of making health care accessible to all especially the vulnerable segment of the population.

Figure 4.3 Percentage distributions of respondents by health insurance coverage



Source: *Generated from the Ghana Demographic and Health Survey 2008*

From the univariate, the finding is that 1257 respondents representing (59.9 percent) are covered by Health Insurance against 842 representing (40.1 percent) of the total sample. It is

interesting to note that more than half of women are covered by health insurance. This observation is very similar to the findings of the Ghana Health Service (GHS 2011). The GHS reported that most attendance at the OPD is covered by some form of Health Insurance.

In a nutshell, this unit examined the individual socio-demographic characteristics of the respondents and how these characteristics relate to similar studies and how it can potentially influence timing and frequency of antenatal utilisation and place of delivery Ghana.

CHAPTER FIVE

ANALYSIS OF RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC VARIABLES AND PLACE OF DELIVERY.

5.0 Introduction

This chapter analyses the results at the bivariate level. The aim of bivariate analysis is to find if there exists any relationship between each of the independent and the dependent variables.

5.1 Timing of antenatal care and place of delivery

The main purpose of this study is to establish if there is any link between timing and frequency of ANC and health facility delivery.

Table 5.1 Percentage distributions between timing of ANC and place of delivery in Ghana.

Place of delivery

Timing of ANC	Home	Health facility	Total
No visit	86.3	13.7	100.0
Early initiation	33.0	67.0	100.0
Late	45.2	54.8	100.0
Total	39.9	60.1	100.0

Chi square =98.834, N =2099 and p-value = 0.000

Source: Generated from the Ghana Demographic and Health Survey 2008

ANC serves as an official entry point to health facility delivery; therefore women must make it a point to report at the nearest health facility immediately they suspect signs of pregnancy.

This must be done in the first trimester.

From table 5.1, women who reported to ANC in the first trimester were more likely to deliver at a health facility compared to women who reported late.

Early and late initiation of ANC recorded (67.0percent) and (54.8percent) respectively. However, women who did not initiate ANC at all had only (13.7 percent). Timing of first ANC is statistically significant with Facility Based Delivery. This study is consistent with the study of Ochako et al. (2011) which explained that there is a relationship between timing of first ANC and health facility delivery.

5.2 Frequency of antenatal care and place of delivery

The number of times a woman visit ANC explains whether the woman delivers at a health facility or not.

Table 5.2 Percentage distributions between frequency of ANC and place of delivery in Ghana.

Place of delivery

Frequency of ANC	Home	Health facility	Total
No visit	86.1	13.9	100.0
1-3	62.2	36.8	100.0
4/ more	32.2	67.8	100.0
Total	39.8	60.2	100.0

Chi square =196.678, p-value =0.000 N =2099

Source: Generated from the Ghana Demographic and Health Survey 2008

Frequency of ANC and place of delivery is another focus of the study. With a p-value of 0.000 frequency of ANC have statistically significant association with Facility Based

Delivery. From table 5.2 respondents who had more than four visits are more likely to deliver in a health facility compared to respondents who had no visits at all: that is (67.8 percent) against (13.9 percent). Most often than not, frequency of ANC has a relationship with place of delivery and this finding confirms that. This finding is consistent with other studies for example Aremu et al: (2011).

5.3 Age of a mother and place of delivery

One of the predisposing factors to health facility use according to the Anderson's Behaviour Seeking model is age. This factor highly predicts the need to seek healthcare at a particular time and that is depicted in the table 5.3 below.

Table 5.3 Percentage distributions of relationship between age and place of delivery in Ghana.

Place of delivery			
Age	Home	Health facility	Total
15-19	46.0	54.0	100.0
20-24	41.7	58.3	100.0
25-29	37.1	62.9	100.0
30-34	35.1	64.9	100.0
35-39	39.9	60.1	100.0
40-44	39.9	60.1	100.0
45-49	61.5	39.5	100.0
Total	39.8	60.2	100.0

Source: Generated from the Ghana Demographic and Health Survey 2008

Chi square = 22.415, p-value = 0.001, N = 2099

Women aged 30-34 years are most likely to deliver at a health facility (64.9 percent) followed by 25-29 years (62.1 percent). Respondents who were less likely to deliver in a health facility were within ages 45-49 years (38.5 percent).

Comparing the two extremes, younger women were more likely to have facility delivery compared to older women in Ghana. This could be due to complacency on the part of the older women since they might have gone through the experience over and over again compared to the younger women who might be having their first child and for that reason might be more cautious. Increase in women's education in Ghana could also explain why majority of women are delivering in health facilities within ages 30-34. In Ghana most women have at least secondary education (GDHS 2008).

However, some women intentionally or unintentionally delay marriage due to many other reasons. Finally, age of a mother has a relationship with Facility Based Delivery in this study at the bivariate level where ($p < 0.001$). On one hand, this finding confirms the findings of (Rhoune; 2003) that young women giving birth for the first time are more likely to deliver at a health facility. On the other hand, this result at the bivariate level contradicts the findings of (Magadi; 1999) which established that older women prefer Facility Based Delivery.

5.4 Educational status of a mother and place of delivery

Education is very crucial in reducing both infant and maternal mortality. When women are educated, it helps create awareness on good nutrition and increases health facility delivery and as educational level improves decision to seek health care increases. From table 5.3, close to hundred percent (96.0 percent) of respondents with higher education had FBD. This study is consistent with many other findings that there is a positive relationship between educational attainment and Facility Based Delivery. For instance, women with higher education at least to a secondary level are more likely to be assisted by skilled attendance in a health facility than women who schooled to the primary level or have no education at all (GSS,GHS and ICF Macro, 2008). However a study by Daniels (2013) among rural Ghanaian

women using Akwapim North District as a case study did not establish any relationship between mother's education and health facility delivery.

Table 5.4 Percentages distribution of educational attainment of mothers by place of delivery

Place of delivery			
Educational attainment	Home	Health facility	Total
No education	62.2	37.8	100.0
Secondary	23.6	76.4	100.0
Higher	4.0	96.0	100.0
Total	36.8	60.2	100.0

Source: Generated from the Ghana Demographic and Health Survey 2008

Chi square 262.828, p-value = 0.000 and N =2099

5.5 Marital status of the mother and place of delivery

Marital status has long been known to have a relationship with health seeking behaviour. From the literature, married women are more likely to seek delivery care at a health facility compared to unmarried and formerly married women. On the contrary, this study found that 68.2 percent of women who never married rather had FBD followed by 63.2 percent formerly married women with 59.4 percent of married women.

Table 5.5 Percentages distribution of marital status by place of delivery in Ghana.

Place of delivery			
Marital status	Home (%)	Health facility (%)	Total (%)
Never married	31.8	68.2	100
currently married	40.6	59.4	100
Formerly married	36.8	63.2	100
Total	39.8	60.2	100

Source: Generated from the Ghana Demographic and Health Survey 2008

Chi square = 4.422 p-value =0.110

It is therefore not surprising that marital status of the respondent is not statistically linked with place of delivery at this level. This finding is contrary to the findings of (Breen; 2011) in Zambia which established that there is a positive relationship between marital status and health facility delivery. Women's education could again expound why this is so. When women are educated, it enhances their understanding on the need to seek professional health care during delivery to avoid preventable deaths. Surprisingly, this study found that single women are more likely to deliver at a health facility compared to married women.

5.6 Birth order and place of delivery

Just like parity or children ever born, birth order is very essential in predicting health facility use. The urgency attached to the first birth is not the same as the subsequent ones all things being equal. However, if things go contrary to what is expected they become more cautious. The result in this study revealed that 71.7 percent of women giving birth for the first time are more likely to have FBD relative to those having their sixth child. Birth order proved to have an inverse association with facility based of delivery with a (p-value of .000). Larger proportion of women with one birth delivered at a health facility relative to women who had four children. Again, as birth order increases, the choice of FBD reduces.

Table 5.6 Percentages distribution of birth order and place of delivery in Ghana.

Place of delivery			
Birth order	Home	Health facility	Total
1 st	28.3	71.7	100.0
2 nd – 3 rd	35.8	64.2	100.0
4 th – 5 th	44.2	55.8	100.0
6 th / more	58.8	41.2	100.0
Total	998	908	100.0

Source: Generated from the Demographic and Health Survey 2008Ghana

Chi square =85.160, N=2099 and p-value = 0.000

Overbosch (2004) established that, pregnancy is a natural experience hence women with much experience are less likely to care about seeking health care during delivery. The finding however, contradicts the results of (Aremu et al; 2011) which says that there is an inverse relationship between higher births and facility based delivery. The study established that higher births lower the likelihood of facility based delivery.

5.7 Place of residence and place of delivery

The choice of place of delivery is highly associated with place of residence that is rural or urban. From Table 5.7, the relationship between place of delivery and place of residence cannot be ruled out: 83.4 percent in urban areas against 44.5 percent in rural areas. Majority of respondents that had Facility Based Delivery were urban dwellers relative to rural dwellers even though majority of the respondents are rural dwellers.

Table 5.7 Percentages distribution of place of residence and place of delivery in Ghana.

Place of delivery			
Place of residence	Home	Health facility	Total
Rural	55.5	44.5	100.0
Urban	16.6	83.4	100.0
Total	39.8	60.2	100.0

Source: Generated from the Demographic and Health Survey 2008 Ghana

Chi square = 318.148, p-value =0.000 and N =2099

Reasons are that health facilities are less accessible in the rural area compared to urban. Contrary to this explanation, there are a few cases in the rural areas where there are well built health facilities but some women feel reluctant to go because they lack the knowledge on the importance of FBD or again, some husbands are against facility delivery relative home delivery. Consistently, (Wang, 2011) found that in most sub-Saharan African countries

facility based delivery is higher in urban areas compared to rural areas. The higher levels of health facility births in the urban areas can be attributed to women's education and wealth as well as high density of health facilities in the urban areas.

5.8 Wealth index or household wealth

Generally, an individual's income which is an enabling factor in seeking health care is very important in studying this relationship. The variable considered which serves as a proxy to an individual's income is household wealth. The results indicate that 92.2 percent of those who had FBD are respondents who belong to the richest wealth quintile compared to 23.6 percent, representing respondents in the poorest wealth quintile.

Table 5.8 Relationship between wealth index and place of delivery in Ghana. (in percentage)

Place of delivery			
Wealth index	Home	Health facility	Total
Poorest	76.7	23.6	100.0
Poorer	48.4	51.6	100.0
Rich	35.0	65.5	100.0
Richer	18.6	81.4	100.0
Richest	7.8	92.2	100.0
Total	39.8	60.2	100.0

Source: Generated from the Demographic and Health Survey 2008 Ghana
Chi square =505.812, p-value = 0.000 and N = 2099

It is very clear from figure 5.8 that, as wealth of a household increases the need to seek professional health care increases. This indicates a positive relationship between wealth index and facility delivery at a ninety nine percent confidence interval even though majority of the respondents were covered by some form of health insurance. This finding is equally in agreement with the findings of (Arthur; 2012) in Ghana. The study found a positive relationship between wealth and FBA even after the introduction of the National Health Insurance.

Therefore enabling factors cannot be overemphasized in an individual's ability to seek health care. This is because there are other embedded costs in FBD such as transportation fee and things like sanitary pad which are required before facility delivery compared to home delivery.

5.9 Health insurance coverage and place of delivery

The aim of health insurance schemes is to reduce the burden of cost during health care seeking. The variable is an enabling factor to health seeking behaviour. This result indicates

that relatively high proportion of the respondents who delivered at the health facility had some form of health insurance coverage 74.3 percent compared to 49.3 percent who delivered at home. It is clear from figure 5.9 that health insurance coverage is statistically linked to Facility Based Delivery.

Table 5.9 Relationship between health insurance coverage and place of delivery in Ghana (in percentages)

Place of delivery			
Health insurance coverage	Home	Health facility	Total
Yes	25.7	74.3	100.0
No	49.3	50.7	100.0
Total	39.8	60.2	100.0

Source: Generated from the Demographic and Health Survey 2008 Ghana
Chi square =117.481, p-value 0.000 and N =2099

The finding is almost similar to (Arther, 2012) insured women were more likely to make at least four visits of ANC and proceed to facility based deliveries. In that study, it was found that 88 percent of those who had skilled deliveries were insured as against 73percent non-insured mothers.

5.10 Conclusion

In summary, most variables used in this study have statistically significant associations with the dependent variable. Frequency of ANC, age, educational attainment, birth order, health insurance coverage, place of residence and wealth index were observed to have statistical relationship with place of place of delivery. On the contrary, timing of ANC and marital status are not related to the dependent variable at this level of the analysis.

It is evident at this level that, there is a positive relationship between educational attainment, wealth quintile and the dependent variable while the relationship between birth order and the dependent variable is an inverse one.

CHAPTER SIX

Timing And Frequency Of Antenatal Care Utilization And Place Of Delivery In Ghana.

6.0 Introduction

The statistical tool used for the analysis at the multivariate stage is the Binary Logistic Regression model. This model is used when the outcome variables are dichotomous. In this study, the outcome variable is dichotomous which means the study sought to know whether respondents deliver at health facility or home. As probability, it ranges from 0 to 1.

The logit of the transformation model is and stated in its standard form as:

$$\text{Log} (P_i / 1-P_i) = X_i P_i$$

Where P_i is the logit transformation of place of delivery and X_i is the independent and intermediate variables. In principle, logistic regression estimates the log of odds of the outcome occurring in terms of a vector of the independent variables and an error term (Ghamfi; 2003).

The resulting odds ratios (OR) indicate the nature of the net impact of independent variable on the probability of the outcome occurring. Odds ratio (OR) less than one ($OR < 1$) signifies a decreased chance of outcome occurring: odds ratio greater than one ($OR > 1$) suggests an increase in the chances of occurring while OR equal one ($OR = 1$) indicates lack or absence of relationship between the independent and the dependent variables. In the logistic regression analysis, predisposing and enabling factors were used as independent and intermediate variables respectively against the need to use a health facility.

The findings are presented in the odds ratio which expresses the magnitude of the effect of each category or alternative choice of place of delivery relative to the reference category. In analysing the results of the Binary Logistic Regression, the odds ratios (B-exponent) were

used to explain how the independent and intermediate variables deviate from the dependent variables and the other way round. The variables were tested at 5percent confidence interval (0.005) suggesting that any variable being considered is significant if its significant value (p-value) is less than 5 percent (0.005) or not significant if its (p-value) is more than 5 per cent.

6.1 Impact of timing and frequency of ANC on place of delivery.

In the first model, the variations in the dependent and independent variables are explained by 12.6 percent (R square = 0.126) However, only frequency of ANC attendance was significant (p-value of 0.040). women who made four or more visits for ANC during pregnancy are 7.959 times likely to have health facility delivery compared to the reference category, odd ratio = 7.959 (CI = 1.105, 57.337).

Table 6.1 (Model 1) Results of Binary Logistic Regression of timing and frequency of ANC utilization and place of delivery in Ghana.

Variable	Exp B	C I	p-value
Timing of ANC (RC)	1.000		
No visit (RC)			
Early initiation	1.903	0.236, 15.374	0.546
Late initiation	1.512	0.187, 12.199	0.698
Frequency of ANC visit			
No visit (RC)	1.000		
1-3	2.388	0.329, 17.374	0.390
4+	7.959	1.105, 57337	0.040*

Nagelkerke = 0.126 p-value 0.005 and * = p < 0.005

6.2 Impact of the intermediate variables on place of delivery.

The second model looked at the impact of the wealth index and health insurance coverage on the dependent variable (place of delivery). After the analysis, it was observed 33.8 percent (R square = 0.338) explains the variations in the independent variables. At this level, all the two

variables were significant at 99 percent confidence interval. This indicates that both variables remain important variables as far as health facility delivery is concerned.

Table 6.2 (Model 2) Results of Binary Logistic Regression of the intermediate variables and place of delivery in Ghana.

Variable	Exp B	CI	p-value
Wealth index			
Poorest (RC)	1.000		
Poorer	3.392	2.555, 4.503	0.000*
Rich	5.764	4.275, 7.771	0.000*
Richer	12.995	9.380, 17.948	0.000*
Richest	33.754	21.257, 53.598	0.000*
Health insurance coverage			
No (RC)	1.000		
Yes	2.268	1.831, 2.811	0.000*

Nagelkerke = 0.338, p-value = 0.005 and * = $p < 0.005$

There is a positive relationship between household wealth and place of delivery (health facility delivery). Poorer women are 3.392 times more likely to deliver in a health facility relative to poorest women, OR= 5.764 (CI = 2.555, 4.503). With odds ratio of 5.764 and (CI = 4.275, 7.771), women within the rich wealth quintile are 5.764 times more likely to deliver at a health facility delivery. Again, respondents falling within the richer and the richest wealth quintiles with OR= 12.995 (CI = 9.380, 17.948), OR = 33.754 (CI = 21.257, 53.598) are 12.995 and 33.754 times more likely to deliver at health facility compared to the reference categories respectively. The second variable (health insurance coverage) was equally significant in the model. Respondents who had health insurance coverage with OR = 2.268 (CI = 1.831, 2.811) were 2.268 more times more likely to deliver at a health facility compared to the reference category.

6.3 Impact of independent and intermediate variables on the dependent variables.

The final model explores all the independent and the intermediate variables against the dependent variable which were already discussed at both the univariate and the bivariate stages of the study. Results from the analysis show that ($R^2 = 0.412$) indicating a 41.2 percent of the variations of the independent variable. However, 58.8 percent of the variations are explained by other variables that are not accounted for in this study. The results from table 6.3 below indicate that six variables out of nine are significant in relation to place of delivery. The variables include age of a mother, place of residence, education of the mother, health insurance coverage, birth order and household wealth. It implies that more research has to be done on those other variables that are significant with place of delivery.

Frequency of ANC attendance was statistically significant in the model with OR =16.754 (CI=1.480, 189.647) and p-value of 0.000, indicating that women who make four or more visits of ANC during pregnancy are 16.754 times more likely to deliver at a health facility relative to the reference category. Again, women who made one to three visits are recorded OR = 8.556 (CI = 0.748, 97.854) where p value is less than 0.005. The findings confirm women who make the recommended visits are more likely to have their birth attended by professionals at health facilities (Kulkani and Nimbalkar 2008). One plausible reason they gave was education and wealth are the most significant determinants for increasing the number of utilisation of ANC.

Age of a mother was highly statistically significant with place of delivery. Women aged 40-44 had OR=4.057 (CI=1.963, 8.384) and *p-value* = 0.000. This means women within this category are 4.057 times more likely to have institutional delivery relative to the reference category. It also indicates that child bearing within these ages is very critical. Similarly, women within the age category 30-34 and 35-39, had recorded close odds ratio of OR =

2.307 (CI= 1.23, 4.31) and OR = 2.54 (1.33, 4.89) respectively. It implies women aged 30-34, 35-39 are 2.307 and 2.549 more likely to use health facilities during delivery.

Women education is another variable that is positively significant in the model. The more education a woman has the more she becomes conscious on health issues. Education enhances female autonomy: women therefore develop confidence and capabilities regarding their health. This explains the positive trend of significance among education and the other variables in the model and why girl child education is of much importance to all governments. Women with primary education are 1.496 more times likely to give birth at health facilities compared to the reference category (no education). Also, women with at least secondary school education with an odds ratio of 1.921 are 1.921 times more likely to have FBD compared to women with no education. Again, highly educated women with OR = 5.529 (CI = 1.112, 27.484) are 5.529 more likely to give birth at health facilities compared to women without any education. This finding is consistent with (Belam et al 2006) and (Gwamaka; 2012).

Marital status may influence a woman's choice of delivery place probably as a result of female autonomy. However, even though single and divorced women may be deficient financially they are more likely to enjoy greater autonomy which helps them to make decisions without necessarily consulting their husbands. At the bivariate level, it was discovered that women with higher education are more likely to deliver at health facility than the other categories. Women with higher education spend more years in school and are more likely to be single mothers explaining why marital status is not statistically significant at the multivariate level. According to (Lemato et al; 2003) on factors associated with non-use of maternal health services, married women were less likely to utilise health facility during delivery compared to single women. The assumption is that single women having their first

child may be taken care of by their family members hence the likelihood of delivering in health facility, again, single women with good jobs can also decide with ease to deliver at health facility compared to married women who might need the permission of their husbands before making such decisions.

Likewise, place of residence is highly significant with place of delivery at 99 percent CI. Rural dwellers are 55.0 percent less likely to have facility based delivery in relation to the reference category (urban) with OR = 0.450 (CI = 0.338, 0.601) and p-value less than 0.005. (Babalola et al; 2009, Hong et al. 2011, Letamo et al. 2003, Magadi et al. 2000) all find statistical significance in place of residence and health facility delivery. Again, (GSS 2008), in 2008 only 43 percent of rural women had skilled attendants at their birth, while 84 percent of births to urban women were attended by skilled health personnel.

Another finding is that birth order is statistically significant in the model. Women having their second and third births with odds ratio 0.722 are 27.8 percent less likely to deliver at a health facility. This finding is confirmed by (Moyer and Mustafa; 2013) that birth order is significant with place of delivery at the multivariate level. A plausible reason could be that women are careful with the first two births compared to the subsequent ones.

Further evidence from Table 6.3 indicates that household wealth is a significant contributory factor to facility based delivery. Women in richest and richer wealth quintile are 8.052 and 4.791 times more likely to have birth at health facility relative to those in the poorest. More so, women with the poorer and rich wealth quintile with odds ratios 2.483 and 2.925 are 2.483 and 2.925 times more likely to experience health facility delivery relative to the reference category.

Just as we saw in model 2, health insurance coverage is also significant predictor of facility deliver. The finding indicates that the cohorts who responded “yes” recorded an odds ratio of

2.009 which implies women covered by one health insurance or the other are 2.009 times more likely to have deliveries at a health facility compared to the reference category.

Table 6.3 (Model 3) Results of Binary Logistic Regression of independent and intermediate variables and place of delivery in Ghana.

Variables	Exp (B)	95% C.I. for EXP(B)	Sig
Age of a mother			
15-19 (RC)	1.000		
20-24	1.522	0.888, 2.607	0.127
25-29	1.797	1.012, 3.192	0.046*
30-34	2.307	1.234, 4.311	0.009*
35-39	2.549	1.326, 4.898	0.005*
40-44	4.057	1.963, 8.384	0.000*
45-49	2.078	0.886, 4.876	0.093*
Place of residence			
Urban(RC)	1.000		
Rural	0.450	0.338, 0.601	0.000*
Wealth index			
Poorest (RC)	1.000		
Poorer	2.483	1.823, 3.383	0.000*
Rich	2.925	2.062, 4.15	0.000*
Richer	4.791	3.224, 7.119	0.000*
Richest	8.052	4.533, 14.302	0.000*
Education			
No education (RC)	1.000		
Primary	1.496	1.121, 1.997	0.006*
Secondary	1.921	1.440, 2.563	0.000*
Higher	5.529	1.112, 27.484	0.037*
Health insurance coverage			
No (RC)	1.000		
Yes	2.009	1.602, 2.521	0.000*
Timing of ANC			
No visits (RC)	1.000		
Early	0.502	0.040, 6.356	0.595
Late	0.513	0.041, 6.467	0.605
Frequency of ANC			
No visits (fc)	1.000		

1-3 visits	8.556	0.748, 97.854	0.084
4-plus	16.754	1.480, 189.647	0.023*
Birth order			
1 st (RC)	1.000		
2 nd -3 rd	0.722	0.509, 1.023	0.067*
4th-5 th	0.498	0.321, 0.774	0.002*
6/more	0.420	0.248, 0.711	0.001*
Marital status			
Never married (RC)	1.000		
Currently married	0.899	0.546, 1.480	0.676
Formerly married	0.937	0.496, 1.767	0.840
Constant	0.062		0.000

Nergalkerke = 0.142, p-value < 0.005

CHAPTER SEVEN

7.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This chapter is a summary of the results of the study which looked at the timing and frequency of ANC and type of place of delivery in Ghana. The chapter also provides recommendations for policy and programme action to increase facility based deliveries to help achieve MDGs four and five.

7.2 Summary

As a general objective, the study sought to examine whether timing and frequency of antenatal care utilization determines facility based delivery in Ghana. Specifically, it also aimed at examining the influence of marital status on type of place of delivery and finally, making recommendations based on findings from the study.

In addition to timing and frequency of ANC, some background information on the mother was also considered. The socio-economic variables examined in this study which serve as control variables include age of the mother, educational attainment, type of place of residence, marital status and birth order. The intermediate variables examined were; wealth index and health insurance coverage.

The hypotheses proposed for this study were: (a) Women who initiate antenatal care visit during the first trimester are more likely to deliver at a health facility as compared to women who initiate ANC visits after the first trimester, (b) Women who attend the required number of antenatal care visit are more likely to be delivered by a SBA than women who do not make the required number and (c) Married women are more likely to deliver in a health facility compared to single women.

To meet the objectives of the study and test the proposed hypotheses, data from 2008 Ghana Demographic Health was used. The study focused on 2099 women aged 15-49 who had their last deliveries prior to the survey.

To verify the relationship between the dependent and independent variables, the study employed univariate, bivariate and multivariate to analyse the data. These were done in chapters four, five and six respectively.

The univariate analysis was used to examine the distribution of respondents' background characteristics. At the bivariate stage, the study employed Pearson Chi-square test+++ to test for association between the independent and intermediate variables against the dependent variable. Finally binary logistic regression was employed to examine the impact of the independent and the intermediate variables on the dependent variable using three different models.

The results of the bivariate and multivariate analysis showed similar findings, with few variations. The results indicated that, in general age of a mother, education birth order, household wealth, health insurance coverage and place of residence are the major drivers of health facility delivery.

Moreover, at the bivariate level where Pearson Chi-square test was used, frequency of ANC, age of the mother, educational attainment, household wealth, place of residence and birth order were all found to be significantly associated with place of delivery at 5 percent confidence level.

Multivariate analysis through binary regression model was conducted at 95% confidence level at four different stages, based on three models. Model I showed the impact of the main independent variables which the first-two hypotheses sought to examine. However, only frequency of ANC was significant at 95 percent confidence interval. The variations in the

model were explained by only 12.3 percent of the independent variables. In model 2, the intermediate variables were tested against the dependent variable to check its impact without the independent variables. At this level, all the two variables were statistically significant at 99 percent confidence interval with R^2 of 0.338 explaining 33.8 percent variations in the model. This indicates wealth index and health insurance coverage as strong predictors of health facility based delivery. In the final model, the variations in the independent variables were explained by 41.2 percent ($R^2 = 0.412$).

7.3 Conclusion

On the whole, maternal age, frequency of ANC visits, birth order, and place of residence, household wealth and health insurance coverage are statistically significant in the model. The relationship between timing of first ANC health facility delivery is inconclusive. However, timing of first ANC is still a sine qua non to facility based delivery.

Even though marriage is a predisposing factor to child birth, it is not an indicator to health facility delivery per this study.

There is also an inverse relationship between education and FBD. Household wealth as a socio-economic indicator is a strong predictor of facility based delivery even where respondents were covered by health insurance.

7.4 Recommendations

Based on the findings from this study, the following recommendations are made:

- To bridge the gap between the low and high patronage in the rural and urban areas respectively, more health facilities should be built in the rural areas.
- The inverse relationship between education and FBD and other aspects of the analysis point to the need to make FBD more friendly and accessible to some

segments of the population. Also the poor, illiterate rural dweller sometimes feels intimidated or humiliated by the attitude of the professional attendants by such apparently innocuous things such as the use of English as a medium of communication and filling of numerous forms. A “Save the Children Report” (1999) this, it states “many women are said to attend antenatal care defensively... they feel that nothing occurs at such visits and unless unwell, there is little need to attend”. The report goes on to state however that “remote areas are reported to be deprived of orthodox health services because there is often no suitable accommodation for the staff... the low morale of nurses due to their conditions of services, limited supervision... are all therefore major obstacles to the success of ANC and FBD.

- It is therefore important for the Government of Ghana and the Ministry of Health (MOH) specifically to invest more in the training and supervision of professional staff and also to ensure that they are given the necessary motivation or incentives to achieve their full potentials for the success of both ANC and FBD most importantly to reduce infant and maternal mortality to the barest minimum.
- Finally, further studies should be conducted to assess the relationship between timing of first ANC and facility delivery to arrive at a better conclusion.

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