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QUALITY OF MATERNAL HEALTH-SEEKING BEHAVIOUR AND PREGNANCY OUTCOMES AMONG YOUNG WOMEN IN GHANA

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ACCEPTANCE

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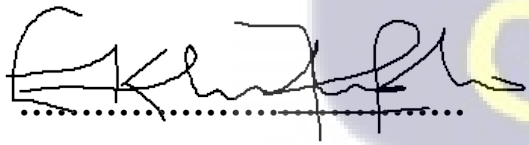
DECLARATION

I, ERNEST KEKELI BOBO, hereby declare that, except for references to other people's work, which have been duly acknowledged, this is the result of my research and it has neither in part nor in whole been presented for another degree.



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ABSTRACT

Pregnancy among young women is a concern worldwide, especially in low- and middle-income countries (LMICs), as they often have a higher incidence of adverse pregnancy outcomes. The utilization of maternal health care services is imperative to reducing the number of perinatal deaths and postnatal complications amongst pregnant women. Attempts to explain this situation have focused on individual and household level determinants, but the role of neighbourhood factors has not received much attention. Understanding neighbourhood factors associated with maternal health-seeking behaviour is important. This is because individuals reside within neighbourhoods and their health-related behaviour can be influenced by the characteristics or conditions of the neighbourhood in which they live.

This study posits that quality of care and neighbourhood-level characteristics are very critical predictors of young women's utilization of maternal health care and pregnancy outcomes among young women in Ghana, in addition to other individual and household characteristics. Drawing on theories of behavioural model of health service use, the three delays, and Donabedian's quality of care model, the study used a modified Behavioural Model of Health Service Use and Quality of care model to understand individual and neighbourhood-level factors on the utilization of maternal healthcare services and pregnancy outcomes among young women in Ghana.

Data from the 2017 Ghana Maternal Health Survey was used to conduct a quantitative study to understand the effects of individual and neighbourhood-level factors on the quality of antenatal care, skilled birth attendance, and pregnancy outcomes. The quantitative study used a sample of 2,669 young women between the ages of 15 to 24 years nested within 900 clusters across Ghana. Multilevel logistic regression models were employed to examine the effects of individual and neighbourhood-level factors on the quality of antenatal care, skilled birth attendance, and pregnancy outcomes. The quantitative analysis revealed both individual and community-level factors as significant predictors of maternal health outcomes in Ghana. For instance, wealthier women and those with higher education were significantly more likely to utilize the quality of antenatal care and delivery services.

The analysis also revealed that after controlling for other factors, place of residence, a neighbourhood variable has no direct association with the quality of ANC, however, it has a direct contribution to skilled birth attendance and pregnancy outcomes. Neighbourhood-level random effects were also significant and there was confirmation of nesting at the neighbourhood level even after controlling for individual and neighbourhood-level variables.

This study provides further empirical evidence that, to improve the strides towards reducing the risk of adverse pregnancy outcomes among women in Ghana, interventions should be targeted at women in poor households living in poor socioeconomic conditions with no access to quality maternal care services. This would have a significant influence on the living conditions of the women and thus, reduce their risk of having a negative outcome of pregnancy.

LIST OF ACRONYMS

ANC – Antenatal Care

ANCV – Antenatal Care Visit

CHPS – Community-based Health and Planning Services

DHS – Demographic and Heath Survey

EAs – Enumeration Areas

EmONC – Emergency Obstetric and Neonatal Care

GHS – Ghana Health Service

GMHS – Ghana Maternal Health Survey

GSS – Ghana Statistical Service

HWI – Household Wealth Index

ICC – Intra-class Correlation Coefficient

ICPD – International Conference on Population and Development

KMO – Kaiser-Meyer-Olkin

LMICs – Low- and Middle-Income Countries

MDGs – Millennium Development Goals

MH – Maternal Health

MMR – Maternal Mortality Ratio

NHIS – National Health Insurance Scheme

NPC – National Population Council

PCA – Principal Component Analysis

PHC – Population and Housing Census

PSU - Primary Sampling Unit

QoC – Quality of Care

SBA – Skilled Birth Attendance

SDGs – Sustainable Development Goals

SES – Socioeconomic Status

SSA – sub-Saharan Africa

TBAs – Traditional Birth Attendance

UNFPA – United Nations Population Fund

UNICEF – United Nations Children's Fund

VAQ – Verbal Autopsy Questionnaire

WHO –World Health Organization

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CHAPTER ONE

BACKGROUND

1.1 Introduction

Pregnancy is one of the major events in the life of a woman. Generally, pregnancy has implications of good tidings and fortune. When a woman becomes pregnant, the woman, her family, and the society or community rejoice greatly and consider it a symbol of happiness. Becoming a mother is associated with high social status and is accorded respect. However, in societies like Ghana where being pregnant out of wedlock is frowned upon, being pregnant at a young age becomes an irreconcilable insult that the family, the community, or the whole of society does not generally welcome. Such pregnancy is usually shrouded in secrecy within the family due to their perceived and manifested social and other associated problems which pose a lot risks such as stillbirth or even death of the young woman during pregnancy or delivery (Gyesaw, & Ankomah, 2013; Yussif et al., 2017). This thesis, therefore, investigates the quality of maternal health-seeking behaviour among young women aged 15 - 24 years in Ghana and how the quality of care affects pregnancy outcomes.

Pregnancy-related problems faced by women, especially young women less than 20 years are a focus of attention globally, mainly due to the high levels of pregnancy and childbearing among these women. In comparison to the developed world, pregnancy and childbearing among young women in developing countries are very common (Banke-Thomas et al., 2017). Globally, about 16 million young women aged 15 to 19 years give birth annually and this constitutes 12 percent of all global births and also makes up 10 percent of global annual maternal deaths (Loaiza & Liang, 2013; UNFPA, 2013). The developing world contributes 95 percent of all births by young women

(UNFPA, 2013). Regional estimates of young women's birth rate per 1000 women vary considerably (UNFPA, 2013). Africa has the highest birth rate per 1000 women less than 20 years at 115, compared to the world's average of 54 births (UNFPA, 2013). Young women's birth rate is higher for sub-Saharan Africa (SSA) at 120 per 1000 but varies within the sub-region with the lowest birth rate of 41 per 1000 reported in Rwanda and the highest of 203 per 1000 reported in Chad (UNFPA, 2013). The birth rate among young women less than 20 years in Ghana was reported at 75 per 1000 (GSS, GHS, & ICF, 2018).

In Ghana, early pregnancy and motherhood have been major health concerns for some time now. Pregnancy among young women aged 15 to 19 declined from 23 percent in 1988 to 14 percent in 2003 and has remained roughly the same since (GSS, GHS, & ICF, 2018). Poverty, gender inequality, and inadequate access to health services have compounded the problem (GSS, GHS & ICF, 2015).

In low-income countries, pregnancy and childbirth are the main causes of death among young women between the ages of 15 and 19 years (Mombo-Ngoma et al., 2016; Sedgh et al., 2015), and of all maternal deaths, 15 percent are amongst young women of age 10 – 24 years (Neal et al., 2016). Moreover, in developing countries, young women 15 to 19 years are twice as likely to die during pregnancy and childbirth as women in their twenties, and the risk of SSA is even greater (Nove et al., 2014). Such deaths contribute to the burden on maternal health. In addition to maternal deaths, studies have found a positive relationship between pregnancy among young women and poor pregnancy outcomes, such as low birth weight, perinatal deaths, and obstructed labour (Althabe et al., 2015; Chen et al., 2010; Ganchimeg et al., 2014; Neal et al., 2016). This is

heightened due to the high incidence of unsafe induced abortion attempts and poor maternal health care, especially amongst young women (Asamoah Oppong & Agardh, 2017; Ushie et al., 2018). Maternal health care service utilization has been identified as a practical intervention that can address this problem.

The utilization of maternal health services contributes to reducing risky pregnancies and premature death. Maternal health services, such as the use of antenatal care (ANC) and institutionalized childbirth are associated with improved maternal health outcomes (Akeju et al., 2016; Asundep et al., 2013; Onwuhafua et al., 2016; Yeoh et al., 2018). Such services are crucial public health responses to reducing morbidity and mortality associated with young women's maternal health. While maternal health services are important for young women, their use is low in sub-Saharan Africa. Understanding the factors that contribute to the use of maternal health care services by young women would promote informed policy development and efficient maternal health programme interventions.

In Ghana, the maternal mortality ratio was estimated at 310 deaths per 100,000 live births during the 2017 Ghana Maternal Health Survey (GMHS), which is indicative of an improvement from the 2007 situation (343 deaths per 100,000 live births) but still high compared to other SSA countries. This high maternal mortality ratio in Ghana indicates that for Ghana to meet Sustainable Development Goal 3.1 of improving maternal health by reducing the maternal mortality ratio to less than 70 per 100,000 live births by 2030, much work needs to be done. Of the maternal deaths used to directly estimate the maternal mortality ratio in Ghana for the seven years preceding the 2017 GMHS, about 23 percent were deaths that occurred among women 15 - 24 years. There has

been no change in the rate of deaths among young women aged 15 – 24 years of about 23 percent compared with the GMHS in 2007 (GSS et al., 2018; GSS et al., 2007). Despite the high-level utilization of antenatal care services, uptake of skilled birth delivery is relatively low among young women in Ghana in addition to its associated high maternal deaths.

The high maternal mortality in Ghana has been attributed to three delays: delays in families deciding to seek health care; delay in transportation of mothers when delivery complications arise; and poor quality of maternal health services (Adika et al., 2017; Thaddeus & Maine, 1994). Of all recorded maternal deaths, about 70 percent were considered preventable (GSS, GHS, & ICF, 2018).

There is an unequal utilization of maternal health services by young women in Ghana by type of service. The difference in the utilization of antenatal care and skilled birth attendance remains a public health challenge. Although utilization of ANC services is almost universal for young women (97.8%), skilled birth attendance at delivery remains much lower (72.2%). About two-thirds of young women below 20 years in Ghana had their deliveries attended to by skilled birth attendance (GSS, GHS, & ICF, 2015).

The high level of use of ANC services and the subsequent drop in the use of skilled birth attendance for childbirth by young women is a cause of concern due to their associated negative maternal health outcomes. According to GSS et al. (2015), mothers under the age of 20 years at the time of birth are more likely to report having a baby with low birth weight (less than 2.5 kilograms) than older mothers. Perinatal and post-neonatal mortality experiences among young mothers

below 20 years were reportedly higher than that of mothers 20 to 39 years (Neal et al., 2018). Inevitably, understanding the factors that either encourage or inhibit young women's use of these maternal health services becomes crucial.

Evidence has shown that early childbearing can have a negative impact on young women by impairing their health and that of their children (Ganchimeg et al., 2014). Research has revealed that early childbearing is related to higher risks of adverse pregnancy outcomes (Althabe et al., 2015; Conde-Agudelo et al., 2005). Complications during pregnancy and childbirth have been identified in developing countries as the leading cause of death among young women. In most cases, young women face challenges that include impaired growth, small pelvic bone, and poor nutrition, which often make them a high-risk group for pregnancy and childbirth (Mombo-Ngoma et al., 2016). Studies also reveal a negative impact of early childbearing on the survival of new-born babies (Loaiza & Liang, 2013; Selemani et al., 2014). Young mothers have high levels of adverse health behaviours, as well as existing health problems that affect maternal and child health outcomes compared to older mothers (Loaiza & Liang, 2013) of which some may be attributed to the lack of use of maternal health services, such as the use of antenatal care and skilled birth attendance (Magadi et al., 2006a).

The use of SBAs was also acknowledged as one of the maternal health interventions that would minimize maternal deaths (Bishwajit et al., 2017; Kohi et al., 2018). However, the use of skilled birth attendance in SSA remains low, with an estimated 60 percent of women using skilled birth attendance (Doctor et al., 2018). To make informed and effective maternal health interventions,

especially among young women, it is essential to understand the factors that determine the use of skilled birth attendance.

Notwithstanding the challenges of achieving the desired level of use of maternal health services, Ghana has developed a favourable strategic and policy ecosystem for the implementation of reproductive health programmes. As part of its mandate to give strategic direction to the improvement of reproductive health care, the Ghana Health Service developed Adolescent Health Service Policy and Strategy, 2016-2020, to provide the framework for achieving the relevant Sustainable Development Goals (SDGs). To address young women's reproductive health challenges, the 2000 Adolescent Reproductive Health Policy was reviewed to provide a framework for realigning and strengthening the existing adolescent sexual and reproductive health service delivery system and align it to the relevant Sustainable Development Goals (SDGs) (UNFPA & NPC, 2016). The aim of this thesis is therefore to explore the influence of quality of care on maternal health-seeking behaviour and pregnancy outcomes among young women in Ghana.

1.2 Statement of the Problem

The use of health care services (antenatal care, skilled birth attendance, and postnatal) is among the main global efforts to lessen maternal and infant fatalities (Titaley et al., 2010). Despite the introduction of strategic policy innovations such as Community-based Health and Planning Services (CHPS) in 1999, the National Health Insurance Scheme (NHIS) in 2004, Emergency Obstetric and Neonatal Care (EmONC), the introduction of the partograph tool in 2010 based on WHO Protocol (Floyd, 2013; Sakeah et al., 2014; Witter et al., 2009) and many more in Ghana,

maternal mortality has stayed high at around 310 per 100,000 live-births for almost a decade (GSS, GHS, & ICF, 2018) and estimates of stillbirth rates range from about 14 to 32 deaths per 1,000 births (Engmann et al., 2012; GSS, GHS, & ICF, 2015; Ha et al., 2012). Currently, Sustainable Development Goal 3 (SDG 3) aims at reducing the global maternal mortality ratio to less than 70 per 100,000 live births by 2030 (WHO, 2015). Consequently, achieving SDG 3 would require much attention and resources directed at young women (15 – 24 years) who will continue to be sexually active in the next decades and thus in continuous need of maternal health services.

The use of skilled birth attendance (SBA) is among the initiatives to minimize maternal morbidity and mortality. Though skill birth attendance in Ghana have witnessed an appreciable increase between 2008 and 2014, it is quite low especially among young women despite the high ANC attendance. In Ghana, skilled birth attendance are mainly found in health institutions including public and private hospitals, health centers, and clinics. The percentage of young women assisted by health professionals during childbirth improved from 52.2 percent in 2008 to 72.1 percent in 2014 (GSS, GHS, & ICF, 2015). Furthermore, the utilization of ANC services has become almost universal at least once during pregnancy. In 2014, 98 percent of young women in Ghana who gave birth to their last child during the five years preceding the survey received ANC services while 87 percent of women had four or more ANC uptake (GSS, GHS, & ICF, 2015).

Increasing coverage of the use of maternal health services is very important, but there is reason to believe that increasing coverage for utilization of maternal health services alone might not reduce maternal and foetal mortality. In Ghana, close to half of maternal deaths occur in health facilities. The institutional MMR (maternal deaths in health facilities) for Ghana was 216 per 100,000 live

births in 1990 (Ghana Health Service, 2017), declining slightly to 201 in 2008, then to 152 per 100,000 live births in 2012. Since 2012, it has been fluctuating: in 2013, it increased to 153 per 100,000 live births, then decreased to 144 per 100,000 live births in 2014, and then increased to about 164 per 100,000 live births in 2016 (Ghana Health Service, 2017). The high institutional MMR suggests that, perhaps the poor quality of care within institutions may be contributing to the high maternal mortality in the country.

Recent suggestions that poor quality of care in health institutions is contributing to the persistent poor maternal and neonatal outcomes in developing countries have increased interest in assessing the quality of maternal health care (Duysburgh et al., 2016; Graham et al., 2013; Graham & Varghese, 2012). However, the emphasis has been on human and physical resources and technical quality at the level of health facilities (Boulkedid et al., 2013; Twum-Danso et al., 2013). Such assessments are important, but the lack of data on the quality of care individual women receive limits our understanding of the quality and coverage link (Graham et al., 2013).

Moreover, factors such as age, education, marital status, and physical distance are known to be significant determinants of healthcare outcomes, especially among young women, but they do not necessarily explain their underlying influences (Asamoah & Agardh, 2017; Sakeah et al., 2014). Besides, much is not known about the specific service barriers that are also often identified in Ghana (Moyer & Mustafa, 2013a; Rominski et al., 2014; Sumankuuro et al., 2017). There is also limited understanding of the behavioural factors underpinning the decisions expectant mothers make concerning the utilization of health care services which literature suggests can pose greater

barriers than resource constraints (Koblinsky et al., 2016; Rishworth et al., 2016; Thaddeus & Maine, 1994).

One limitation of many of these analyses is that they identify what the "causes" of the morbidities and mortalities are, rather than establishing the underlying "enabling factors" or determinants, many of which are interdependent. This, in part, reflects how these studies were designed and implemented (Amzat, 2015; Moyer & Mustafa, 2013a; Murphy, 2016). Meanwhile, policy initiatives in Lower and Middle-Income Countries rely on such national surveys which may account for the slow progress of these countries in achieving global goals. Maternal health literature shows that it is unusual for a barrier to have a single cause; more commonly, there are several underlying factors, which are often interdependent. Attempts to overcome a given problem are less likely to be successful if stakeholders ignore other independent issues or factors.

In addition, there is evidence in the literature of characteristics related to maternal health-seeking behaviour at the individual level in developing countries (Asamoah & Agardh, 2017; Baafi et al., 2019; Manyeh et al., 2020; Sakeah et al., 2017), but associations with neighbourhood level characteristics, have largely been understudied especially among young women in Ghana. It has been noted that one of the major problems hindering investigations of the effects of socio-demographic variables on a wide range of pregnancy outcomes is the scarcity of well-structured multivariate techniques to determine the relative importance of the various socio-demographic factors that have an impact on pregnancy outcomes (Wildschut, 2011).

This study, therefore, aims to determine the extent and nature of the relationship of individual/household characteristics with maternal health-seeking behaviours by considering the

residential context of the woman. Thus, this research explores the effect of individual and neighbourhood level factors on ANC quality, skilled birth attendance, and pregnancy outcomes by applying a multi-level methodological approach. Consequently, two-level random effects models are adapted. The multilevel analysis enables the assessment of how maternal health services use and pregnancy outcomes differ across neighbourhoods and outlines characteristics associated with individuals which describe such variations.

1.3 Research Questions

The research seeks to answer the following questions:

i) What are the factors that affect the quality of antenatal care service utilization among young women in Ghana?

ii) What factors determine the utilization of skilled birth attendance among young women in Ghana?

iii) To what extent does the quality of care and skilled birth attendance affect pregnancy outcomes among young women in Ghana?

1.4 Research Objectives

The overarching goal of this study is to examine the individual/household and neighbourhood level factors which inform the utilization of maternal health care services by young women in Ghana and how the quality of care affects pregnancy outcomes.

The specific objectives are to:

i. examine the factors affecting the quality of antenatal care among young women in Ghana.

ii. determine the factors affecting the utilization of skilled birth attendance among young women in Ghana.

iii. establish the relationship between quality of antenatal care and pregnancy outcomes among young women in Ghana.

1.5 Rationale for the Study

The problems faced by young women especially in poor countries are multidimensional and therefore require a holistic approach to mitigate (Bhutta et al., 2012). Studies in the least and middle-income countries have accepted the fact that young pregnant women experience unique reproductive challenges in contrast to older pregnant women and have diverse maternal outcomes (Chaibva et al., 2013; Dawn et al., 2012; Weng et al., 2014). Various researches have also found a clear association between early childbirth and high negative pregnancy outcomes, increased maternal and child mortality, limited social mobility, and employment problems among young mothers (Minjares-Granillo et al., 2016; Mombo-Ngoma et al., 2016; Sedgh et al., 2015).

Maternal mortality in Ghana is still high and showing little signs of declining. For example, Institutional Maternal Mortality Ratio (IMMR) increased from 142 in 2015 to 164 per 100,000 births in 2016. The country has also witnessed a reversal of some reproductive health indicators, such as the infant mortality ratio, which is indicative of an inadequate health care system (Ghana Health Service, 2017b). The inadequate health care systems for young women compound their vulnerability to maternal morbidity and death, as well as that of their infants. Development of policies and programmes affecting young women's use of maternal health policies which are based on inadequate contextual-level evidence may hamper the enhancement of young women's maternal and reproductive health. It is imperative that such arrangements and programmes are based on a detailed assessment of the nature and multiplicity of the characteristics that determine young women's health-seeking behaviour, consequently bridging this research gap.

Moreover, while young women between the ages of 15 and 24 years have varying levels of maternal health care use compared to the general population (Banerjee et al., 2015; Geary et al., 2015), findings on inequalities in the utilization of maternal health services were carried out mainly in the general population with hardly any reference to the nuances and patterns of inequality that might occur among younger population (Pretorius et al., 2015).

This research significantly contributes to the literature regarding how the quality of care influences young women's utilization of health care services and pregnancy outcomes since such information is scarce in developing countries, and more specifically in Ghana. Young women make up a significant number of Ghana's population and addressing their needs for reproductive health is of public health importance when we consider the proportion of young women at risk of maternal deaths and reproductive morbidity, and the potential consequences both at the individual/household and neighbourhood levels. A specific focus on individual behaviour and personal responsibilities have a limited effect unless neighbourhood influences are also addressed.

Simultaneous investigation of the effects of both the individual-level and neighbourhood-level characteristics is expected to provide important outcomes. These findings will enable policymakers not to analyze the use of healthcare services by young women in isolation, but also to consider the significant role of neighbourhood factors that underlie the use of healthcare services by young women. The study provides an adequate understanding of the relevant mechanisms for designing intervention programmes in different settings on maternal health care.

1.6 Structure of the thesis

The thesis consists of seven chapters. Chapter one presents the introduction to the thesis. This comprises the study background, problem statement, research questions, study rationale, and objectives. Chapter Two focuses on the theoretical and conceptual framework for the study. The chapter also presents the literature review on the utilization of maternal healthcare. Chapter Three presents a description of the data and methodology used for the study. Chapter Four presents findings from the analysis of factors associated with quality antenatal care among young women in Ghana. This chapter used survey-based data from the GMHS. A 2-level multilevel logistic regression model was used to examine the interrelationships between the individual and neighbourhood factors on quality ANC among young women of the survey respondents. Chapter Five investigates the determinants of skilled birth attendance among young women in Ghana. The analysis of SBAs is based on being assisted by a trained health professional during delivery. A 2-level multilevel logistic regression model was used to determine the effect of both individual and neighbourhood characteristics on SBAs among young women. Chapter Six focuses on factors associated with pregnancy outcomes among young women in Ghana. Multilevel logistic regression models are used to identify factors associated with this outcome. Factors considered to be potentially important include various socio-demographic risk factors, maternal health care factors, and neighbourhood factors. Finally, Chapter Seven gives a summary of the main findings and the conclusions that are derived from these findings, including the policy implications and recommendations for future research.

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CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Introduction

There is substantial evidence that the use of maternal care services provides numerous maternal and infant health benefits (Alexander & Kotelchuck, 2001). This chapter focuses on a review of literature on maternal health care service utilization and pregnancy outcomes and identifies the gaps in the available literature. This chapter is segmented into two main parts. The first part of the literature review broadly examines the concept of maternal health and care utilization, quality of care, and maternal care utilization among young women. It narrows the focus down to knowledge of maternal health care attributes and personal characteristics associated with the quality of health care services and pregnancy outcomes. Studies pertinent to the quality of maternal care utilization and pregnancy outcomes are reviewed. Considering the theoretical framework of the study, approaches to quality assessment and measurement in maternal health care services are discussed. The second part deals with the theoretical approaches to measuring quality maternal health care services. It describes Andersen's (1973) health behavioural model, Thaddeus and Maine's (1994) Three Delays Model, and Donabedian's (1966) quality of care using structure, process, and outcome measures. A conceptual framework was developed by utilizing and synthesizing relevant components of the theories reviewed as well as the available literature. This was done to help explain interrelationships between the issues involved in the research problem.

2.2 Health System in Ghana

Public and private health facilities provide health care in Ghana. The public health facilities are mainly under the Ghana Health Service, the Teaching hospitals, and those established by quasi-government institutions such as the Police hospital, military, and public university hospitals. The private healthcare facilities consist of faith-based facilities, private-for-profit, and private not-for-profit health institutions, and the traditional health system. Health services in the public sector are organized into a three-tier health delivery system made up of the primary, secondary, and tertiary levels. The primary level includes health facilities located in the district, sub-district, and community level. At the primary level of the health care delivery system, the district hospitals serve as the main referral facility for the Community based Health Planning and Services (CHPS) compound, health centers, and clinics located at the sub-district level. A typical district with a population of 100,000 may have one hospital, five health centers, and a 10 - 15 CHPS zone (Nonvignon et al., 2018b).

In the second stage of the healthcare delivery system, the regional hospitals, act as the referral level for secondary healthcare and are run by general practitioners and specialists. There are ten regional hospitals receiving referrals from 216 districts and providing outreach support to the districts. Komfo Anokye Teaching Hospital, Korle-Bu Teaching Hospital, Cape Coast Teaching Hospital, and Tamale Teaching Hospital are the current teaching hospitals providing tertiary care and training for doctors. The primary, secondary, and tertiary health facilities provide different services and also form the hierarchy of referral systems in health service delivery in Ghana.

The health sector uses an integrated approach to the delivery of health services covering preventive and promotive services, clinical care, and emergency services. As of 2013, over 75 percent of all health facilities were government-owned, followed by private institutions (19%) and the Christian Health Association of Ghana (CHAG) constituting about six percent (Nonvignon et al., 2018b). Ghana successfully enacted and passed the National Health Insurance Act (Act 650) into law in 2003, paving way for the establishment of the National Health Insurance Authority (NHIA) as the regulatory body for all health insurance schemes (both public and private) in the country. This subsequently led to the establishment of the National Health Insurance Scheme (NHIS), a form of social insurance scheme under the NHIA, and the former commenced operations in 2004. With over 95 percent of all diseases afflicting Ghanaians covered, the basic package under the NHIS covers all costs, including in-patients, outpatient care, full payment for medicines included in an approved list, and payments for referrals that are in the approved list of NHIS (Kwarteng et al., 2019).

As of 2014, the NHIS enjoyed a total subscriber base of 10,550,000 (over 39.0 percent of the population), with 1,930 health care facilities accredited nationwide to provide services to these members including all government facilities and many privately-owned facilities such as private pharmacies, laboratories, and diagnostic centers (NHIA, 2011). In 2012, the annual premium was fixed between GH¢7.20 and GH¢47.70 (US$8.00–$53.00) whilst registration was GH¢2.00 (the US $2.20, with free coverage for elderly citizens older than 70 years and children below 18 years (Kwarteng et al., 2019; Nonvignon et al., 2018a).

Ghana has made significant progress toward bringing primary health care services closer to individuals and their families in their communities. The adoption of the CHPS in 2000, under which trained community health nurses serve as the first point of clinical contact and referral in addition to offering basic public health services such as immunization to local communities and individuals has since yielded a considerable improvement in health outcomes across the country (Lawson & Essuman, 2016). Nevertheless, Ghana's current population-to-doctor ratio of 10,032:1 and the population-to-nurse ratio of 1,240:1 as of 2011 (Lawson & Essuman, 2016) are far below the WHO's recommendation of 4.45 skilled health professionals per 1000 population (WHO, 2020). Compounding the lack of capacity to meet primary care needs by the mainstream health care workforce is the palpably skewed distribution of doctors in the country; in 2015, 74.4 percent of the 3,164 physicians in Ghana practiced in hospitals in the Greater Accra Region or at the Ashanti Region. The uneven distribution of physicians in the country significantly affects the volume and value of primary care delivered to Ghanaians, with rural dwellers and remote communities worse affected (Nonvignon et al., 2018b; Snow et al., 2011). This observation is of interest to the current study, as the uneven distribution of health personnel and facilities across the country will not only influence access to primary care services but will also affect the health-seeking behaviours of individuals, with possible variations between rural and urban dwellers.

2.3 Concept of Maternal Health Care Utilization

According to the World Health Organization (2012), maternal health is the complete state of the mental, physical, social, and emotional well-being of women during pregnancy, childbirth, and the postpartum period. Maternal health, from a safe motherhood perspective, means making sure that all women obtain safe and healthy care throughout pregnancy and childbearing (Starrs, 2006). The

components of maternal health that contribute to the efforts to reduce maternal morbidity and mortality are family planning, preconception, and prenatal and postnatal care (World Health Organization, 2012). A high standard of maternal health status is an economic investment for every nation. The use of maternal healthcare services has been linked to better maternal and neonatal outcomes (Babalola & Fatusi, 2009; Mekonnen & Mekonnen, 2003).

The International Conference on Population and Development (ICPD) held in Cairo in 1994 called on international communities, governments, and donor agencies to halve maternal deaths by 2000. Interventions that were suggested to ensure the reduction of maternal and neonatal mortality and morbidity were accessibility to essential obstetric care for women, availability of adequate logistics and equipment at health facilities, quality maternal healthcare services, availability of adequate skilled birth attendance (SBAs), efficient transportation and referral systems for the timely intervention of emergencies when necessary (Starrs, 2006).

Globally, around 830 women die every day from preventable causes related to pregnancy and childbirth according to the WHO (WHO, 2016). According to the report, the global maternal mortality ratio (MMR) has reduced by 44 percent from 523,000 in 1990 to 303,000 maternal deaths in 2015. These maternal deaths mostly occur because of complications during pregnancy and childbirth (Alkema et al., 2016). Unfortunately, these deaths could have been prevented with the uptake of SBAs services during pregnancy, labour, and postnatal period. Almost all (99%) of the maternal and new-born mortality cases occur in developing regions where resources for maternal health care constitute a major challenge. SSA accounts for about 62 percent of global

maternal deaths (Alkema et al., 2016). This is because about 53 percent of pregnant women in SSA still deliver without the help of skilled birth attendance.

The major causes that account for about 75 percent of all maternal mortality are severe haemorrhage, infection, risky abortion, eclampsia, and obstructed labour (WHO et al., 2014). The other direct and indirect causes constituting 25 percent include anaemia, malaria, malnutrition, violence, high-risk pregnancy, and infectious diseases (WHO et al., 2014). Experiencing pregnancy in early life, or too late in life, too many pregnancies and short intervals between pregnancies are also some of the identified factors which predispose women to pregnancy and delivery complications (GSS, GHS, and ICF, 2015). These factors most often affect women's health status negatively leading to birth injury, miscarriage, or stillbirth, anaemia, fatigue, gestational blood pressure increase, and decreased immunity to diseases like malaria and reproductive tract infections (WHO et al., 2014).

According to GSS et al., (2015), the major causes of maternal death, in most of the regions in Ghana are haemorrhage and hypertensive disorders. The predisposing factors which lead to maternal deaths in the country are personal/family/community factors; delay in seeking care, inability to identify danger signs, poverty, lack of transportation in the community, and socio-cultural factors which prevent women from seeking health care at health facilities. Transport and communication challenges included non-motorable roads, poor communication systems, inadequate number of ambulances in various regions, delayed response from ambulance services, and clients paying for ambulance services (GHS, 2015). In addition, inadequate and inappropriate

distribution of essential logistics and supplies for essential obstetric care services are other factors that account for maternal deaths in Ghana (GHS, 2017).

According to the GHS (2018), poor service provision by health personnel could lead to the death of women during pregnancy, labour, delivery, and postnatal period. Behaviours and practices of health workers which could lead to maternal death include poor examination of pregnant women; poor collection and documentation of information about pregnant women; improper management of pregnant women during labour and delivery, and negative attitudes toward pregnant women (GHS, 2018). These factors could deter pregnant women from using SBAs; leading to an increase in maternal and neonatal deaths (GHS, 2018).

To prevent unexpected complications that are associated with pregnancy and delivery, quality maternal health services must be accessible and affordable to all women of child-bearing ages (Dawson, & Homer, 2012). Kruk et al. (2007) indicated that to reduce MMR there is the need for mothers to have access to skilled birth services (SBS) during labour and delivery and emergency obstetric services. Ghana has made significant progress in increasing access to maternal health care services. According to the GHS (2018), between 2014 and 2017, functional Community-Based Health Planning and Services (CHPS) zones were increased by 73 percent, that is from 2,948 to 5,100. Currently, all the CHPS zones offer basic maternal health services and make referrals of any obstetric emergencies to appropriate health facilities. Overall, about 47 percent of out-patient services were provided by CHPS, sub-district clinics, and health centers. These health facilities are very accessible to patients and clients mostly pregnant women. The training of midwives also increased from 472 in 2011 to 1,305 in 2014 (GSS, 2015).

Ghana was able to reduce MMR by 50 percent by 2014 (from 634 per 100,000 in 1990 to 319 per 100,000 in 2014) though the trend of reduction fell short of the 5.5 percent annual decline required to achieve the MDG 5 target of 185 per 100,000 by 2015. This could be because of inadequate allocation of health resources to deserving communities as well as the neglect of some components in the fight against maternal mortality (GSS et al., 2015). The failure of Ghana to achieve the MDG 5 stemmed from the low coverage of SBAs (57%). In a bid to find out the actual cause of failure, this study seeks to investigate the factors that accounted for quality ANC and the low utilization of SBAs. The findings of the study will inform maternal health policies and interventions that will enable most pregnant women in Ghana to use SBAs, especially young women.

2.4 Quality and Maternal Health Care Service Utilization

Significant progress has been made towards the achievement of MDGs 4 and 5 but low-income countries were projected to be unable to achieve both targets (Lozano et al., 2011). What is missing from the goal of access to maternal health care service utilization and emergency obstetric care (EmOC) is the word "quality." Saving the most lives will require more than increasing coverage of care alone; quality of care, or the availability of people with appropriate skills and the essential equipment and drugs, must be improved and must remain high to maintain demand for these services (Kinney et al., 2010). Service statistics and information about the coverage of interventions only tell part of the story; e.g. whether a woman delivered with a skilled birth attendant does not indicate the quality of the services she received, including whether she was provided with all of the services that she was supposed to receive. There are instances where skilled staff are available but maternal mortality remains high, indicating that the availability of

trained staff alone is not enough to improve maternal health (Shiferaw et al., 2013). While the coverage of Antenatal Care (ANC) and Skilled Birth Attendance (SBA) may be increasing in some countries, maternal mortality rates remain high, indicating that these indicators only provide information about contact with an SBA, not the content or quality of that contact.

During the 1978 International Conference on Primary Health Care in Alma Ata, health was declared to be a fundamental human right of which attainment at its highest level was the most important worldwide goal (World Health Organization, 1978). In 2000, the UN Committee on Economic, Social, and Cultural Rights adopted a General Comment on the Right to Health that included "quality" as one of the elements of the right to health. The Comment stated that: "health facilities, goods, and services must be scientifically and medically appropriate and of good quality" (WHO, 2016: p. 13). The definition of quality, however, was not clearly defined in that Comment.

The term Quality of Care (QoC) has become ubiquitous throughout the literature, but the actual definition of this term is not clearly stated. Quality is not defined in a standardized way and providing concrete definitions of the term is often overlooked because the meaning may be implied. However, "even without a concrete understanding of what quality means, everyone seems to agree that it is something worth organizing ourselves around and that it ought to be monitored, measured and improved" (Goldenberg, 2012: p. 247). So, while there seems to be a consensus that quality is important, there is a lack of consensus on what the term means.

Quality of care is a multidimensional concept that includes an adequate application of efficient clinical and non-clinical interventions; enhanced infrastructure; health workers' attitudes; patient and provider satisfaction and improved health outcomes (Souza et al., 2013). For a patient at Johns Hopkins Hospital, the perception of quality care may differ greatly from a patient receiving care for the same medical issue in a rural hospital in Ghana. The health worker in each of these communities will likely also have different perceptions of quality based on known resources available in each setting, and communities may have different perspectives about the services that they find to be acceptable. At the government or Ministry of Health level, quality may be related to efficiency and the most judicious use of scarce resources.

The World Health Organization suggests six (6) areas or dimensions of quality at the health centre. This includes being effective; efficient; accessible; acceptable/patient-centred; equitable, and safe (WHO, 2006). These areas of quality overlap somewhat with Donabedian's, (1990) Seven Pillars of Quality (efficacy; effectiveness; efficiency; optimality; acceptability; legitimacy; and equity). In low-income countries, Frater (1997: p. 197) found that quality of care "…is about proper management of organizations, cultural values, and building an integrated approach to providing access to care among front line staff, agreeing on appropriateness and deciding on standards for effective delivery of services". Hulton et al., (2000: p. 7) defined quality of care in the context of maternal health as "…the degree to which maternal health services for individuals and populations increase the likelihood of timely and appropriate treatment for achieving desired outcomes that are both consistent with current professional knowledge and uphold basic reproductive rights". They also presented a framework (Figure 2.1) that identifies six elements related to the provision of care: human and physical resources; the referral system; management of information systems; the

use of appropriate technologies; internationally recognized good practice; and the management of emergencies. The framework also includes four aspects that relate specifically to the experience of care: human and physical resources; cognition; respect, dignity and equity; and emotional support.

Figure 2.1 Hulton's Framework for Assessing the Quality of Maternal Health Care

Source: Hulton et al., (2000)

Bruce (1990, p. 62) defined quality in the context of international family planning as "…the way individuals and clients are treated by the system providing services". Bruce also defines the elements that constitute quality in family planning to include "…choice of methods, the information given to users, technical competence, interpersonal relations, follow-up or continuity mechanisms and the appropriate constellation of services" (Bruce, 1990: p. 64). In the context of labour and delivery, the choice may not always be as relevant when it comes to medical interventions as compared to choice in family planning (e.g., a woman should be given the choice of contraceptive method but does not necessarily need to choose whether the active management of the third stage of labour or management of new-born asphyxia is performed during life-threatening conditions). At the same time, the woman should be given the option of choosing her birthing position or of having a companion with her during labour. Pittrof et al. (2002, p. 278) proposed the following definition for quality of care in maternity services: "High quality of maternity care services involve providing a minimum level of care to all pregnant women and their new-born babies and a higher level of care to those who need it. This should be done while obtaining the best possible medical outcome, and while providing care that satisfied women and their families and their care providers. Such care should maintain sound managerial and financial performance and develop existing services in order to raise the standards of care provided to all women."

The Institute of Medicine (2001, p. 44) defines the quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge". This definition seems to succinctly capture the key concepts from the other quality of care definitions without presenting specific components.

While there are some overlapping components in the definitions of quality of care, there are likely to be some characteristics that have greater application in low- and middle-income country settings when both financial resources and choices in care are limited. In particular, safety and choice are components of quality that are not explicitly stated in Donabedian's (1990) Pillars of Quality, but these components can be especially important in settings in which there is coercion or in settings where patient safety in a facility-based setting is an issue.

Quality of care is important because in high-income settings, one of the reasons that quality matters is because people generally have more choices about where they go to receive care. In the context of family planning, Bruce (1990, p. 62) noted that "the interpersonal dimensions of care are strongly influenced by the quantity of care – the amount and nature of contact between the client and the provider." These same choices may not be available in low-income settings where there are few health facilities. When choices are offered, perceived quality about an individual provider can affect the clients' willingness to receive and pay for services, in part due to mistrust (Andaleeb, 2001; Bruce, 1990). Perceptions of quality can take precedence over concerns about distance and cost (Onah et al., 2006). This is especially important in settings where out-of-pocket expenditure can take up a significant proportion of a family's income. Although health services may also be free in public facilities, there are still costs related to transportation to the facility, food, and supplies in some cases. Indirect costs can include loss of time when waiting for services. In Ghana, the government provides free health services for all pregnant women through the National Health Insurance Scheme (NHIS) but there are still out-of-pocket costs that need to be covered by the client (Atinga et al., 2014). Lack of trust in the formal health care system and mistreatment by providers could also encourage people to seek alternative care that could result in more harm.

2.4.1 Utilization of Health Care Services by Young Women

Improved maternal and neonatal outcomes are associated with the use of maternal health services (Babalola & Fatusi, 2009). According to Magadi (2006), young women are more likely to experience unintended and premarital births than older women and are less likely than older women to be provided with better health care. Most studies on the utilization of maternal health care services in sub-Saharan Africa mainly focus on women in general (Afulani, 2016; Alam et al., 2015; Doctor et al., 2018; Moyer & Mustafa, 2013). Studies that focused on young women have not adequately addressed what influenced young women to make more informed decisions on maternal health care. Such studies addressed perceptions of health personnel (Chaibva et al., 2013) and youth-friendly appropriateness of services as factors that influence the use of maternal health services (Boamah et al., 2016; Gyesaw & Ankomah, 2013; Krugu et al., 2017).

A study by Magadi et al., (2006a) examined young women in 21 SSA countries on the use of maternal health services and found little change in maternal health care by age based on bivariate analysis. After controlling for background characteristics of women, young women were found to have poorer maternal health care than their older counterparts. An analysis of regional differences shows substantial variations in the levels of maternal health care across countries. There is no evidence of significant variations across countries in the observed patterns of maternal health care by maternal age. According to Magadi et al (2006a), in countries with relatively better maternal health care, the gap between young women of different characteristics is more pronounced. This suggests that the socio-economically disadvantaged subgroups may have benefitted least from improvements in maternal health care in such settings.

A significant number of SSA women have poor maternal health services in general (WHO, 2003). WHO (2003) also found that women in SSA initiate ANC late and found no association with maternal age. However, young women were found to be more likely to commence ANC late, make inadequate ANC visits during pregnancy, deliver outside health facilities, and had unskilled birth attendance at their births - compared to older women. A negative pregnancy outcome is associated with late initiation of ANC (WHO, 2003). Furthermore, the substantially low number of births assisted by skilled birth attendance is associated with high mortality rates for mothers (Buor and Bream, 2004). Largely, both services and research have not adequately focused on young women, their health and information needs, and what influences them to make more informed decisions on their reproductive health care.

In Ghana, the use of ANC is high compared to other countries in the sub-Saharan African Region (GSS, 2015). Despite the high antenatal care utilization amongst women in Ghana, substantial disparities exist across the socio-demographic continuum. Besides, the majority of women did not meet the WHO recommendation to attend antenatal care within the first trimester of pregnancy (Doku et al., 2012). The behaviours were dissimilar between younger women and older women as younger women preferred shorter spaced ANC visits whereas older women were generally not concerned with the ANC visits (Doku et al., 2012; Lambon-Quayefio & Owoo, 2014). Also, socio-cultural beliefs had a great influence on pregnancies. The authors noted that women believe that pregnant women are vulnerable to all forms of spiritual threats, especially during the early period of pregnancy (Dako-Gyeke et al., 2013; Ganle et al., 2015).

Boamah et al., (2016) examined factors explaining the gap in antenatal care service utilization between younger and older women in Ghana. The study revealed that young women's utilization of ANC services could be influenced by demographic factors such as age, parity, and marital status. The authors indicated that the lack of knowledge on the benefits of antenatal care for young women could be deterring these women from antenatal services. Service-related factors such as the quality, accessibility, and affordability of antenatal care services were also mentioned as factors that could influence the utilization of antenatal care services by young women.

In another study that examined factors associated with reproductive health care utilization among Ghanaian women, Doku et al., (2012) found that unemployed, single, and economically dependent women were less likely to utilize ANC services. Young women were found to have an individual perception about ANC services, which hindered them from using the services. The authors also found that young women had limited knowledge and misconceptions about ANC services. The findings also indicate that antenatal care services were perceived to be of poor quality, and hence would not benefit them and their babies. The study revealed that religious factors, financial constraints, and fear of disclosing their pregnancies to their parents influenced the non-utilization of antenatal care services by young women.

Although utilization of institutional delivery services is still regarded as low in Ghana compared to WHO recommendations, studies on factors influencing the use of health facilities for delivery are also scarce. Crissman et al., (2013) investigated pregnant women's perspectives on skilled birth attendance and facility-based delivery in Ghana and found out that women preferred home deliveries. The study revealed that women expected cleanliness and non-interference during

labour and delivery and such expectations are met at home. According to these women, cultural expectations are met at home with abundant family support. Institutional deliveries and accessing institutions for delivery were said to be costly to women despite waived facility fees. Other factors contributing to low utilization of institutional deliveries identified included lack of knowledge regarding the danger signs of pregnancy and negative perceptions of skilled health personnel working at the health institutions. In another study on factors contributing to disparities between ANC bookings and institutional deliveries in the northern parts of Ghana, Dickson et al., (2017b) found that distance was a major deterrent to institutional deliveries.

Despite the many benefits, the use of health care services such as antenatal care attendance, skilled birth attendance (birth preparedness), and complication readiness have often been ignored in the policy dimensions (design through to implementation) of the health sector in Ghana (Knight et al., 2013; Rishworth et al., 2016), and it is not uncommon to find women who have had all their childbirths in rural communities without ever attending a single episode of prenatal care (Rishworth et al., 2016).

2.5 Individual/Household Level Determinants of Maternal Health Care Use

The key individual/household level characteristics identified include the age, educational attainment of mothers, economic influences, preference for traditional birth attendance, and poor health facilities.

2.5.1 Education

Educational levels of expectant mothers and families may have a profound influence on skilled maternal health service utilization, especially in the hard-to-reach communities of low and middle-

income countries (Bayu et al., 2015; Lori et al., 2014; Sychareun et al., 2016). The importance of education to improving health outcomes generally and maternal and neonatal health more specifically cannot be underestimated. This is because education is valuable to be able to identify clear health needs and the available services and to enhance obstetric knowledge on early warning signs and timely and appropriate sources of care (Acharya et al., 2015). Furthermore, maternal education and formal literacy may serve as barriers to knowledge and implementation of ANC, birth preparedness, and service utilization in rural settings (Atekyereza & Mubiru, 2014; August et al., 2015; Ganle et al., 2015a). For example, Bayu et al. (2015) found that pregnant women in Tigray-Zone, Ethiopia, with some formal education and knowledge of obstetric danger signs were more likely to attend ANC, as well as prepare for skilled attendance at birth (SBA) and be ready for complications than pregnant women with lower levels of formal education.

Similar observations were reported in Tanzania and Uganda (Atekyereza & Mubiru, 2014; August et al., 2015). Low-skilled care usage in rural parts of Burkina Faso was associated with low maternal literacy and low educational levels, which made women and their families unable to identify danger signs of complications (Soubeiga et al., 2014). On the other hand, in communities with relatively increased knowledge of danger signs, there was a corresponding increase in birth preparedness and complication readiness, and skilled maternal health services uptake in Burkina Faso (Soubeiga et al., 2014). However, having fundamental literacy skills does not always equate with higher levels of utilization of maternal health care services. An exploratory study in Komfo Anokye Teaching Hospital in Ghana, involving ANC attendees above 18 years who could read or write in English or Twi (the local language of the area), found that women utilized ANC services and received lessons on birth preparedness but could not translate the knowledge into practice

(Lori et al., 2014). Even women who lived in relatively affluent communities with proximity to health facilities but with no formal education and low maternal health literacy failed to utilize skilled health services (Dako-Gyeke et al., 2013; Hill et al., 2007).

To address low maternal literacy levels in Ghana, expectant mothers are given information on danger signs in pregnancy through verbal communication, pictures on the walls in the clinic, and the back of ANC cards illustrating danger signs (Aborigo et al., 2014). Thus, pregnant women who attend ANC are expected to be competent in recognizing danger signs in pregnancy (Soubeiga et al., 2014). Similar education campaigns in Ethiopia and Burkina Faso have resulted in increased awareness and knowledge of danger signs (Soubeiga et al., 2014; Tura et al., 2014). Overall, increasing the knowledge of danger signs in pregnancy, labour, and postpartum and for the neonate, has been one of the key reasons for campaigns to increase health literacy in rural communities in many sub-Saharan African countries (Ganle et al., 2016; Gudu & Addo, 2017; Hailu et al., 2011).

In some studies, non-compliance with utilizing health care for ANC and birth preparedness was attributed to illiteracy, women's uncertainty about the severity of symptoms, or poor understanding of health messages (Asamoah et al., 2011; Mbalinda et al., 2014). An evaluation in rural Tanzania found that there was a positive correlation between men's literacy levels and use of healthcare services, including those who had previous contact with the health system (August et al., 2015). However, other literature showed that preparedness education does not often involve the men, the community, and even the TBAs (Ditekemena et al., 2012; Duysburgh et al., 2015). Although there could be complex relationships between low literacy and the status of women, the

evidence suggests that they can be inextricably linked, such that when literacy rates and maternal autonomy improve, maternal outcomes often improve (Amzat, 2015; Mrisho et al., 2007a).

2.5.2 Age

Age is a significant predictor of risks in pregnancy and childbirth (Blencowe et al., 2016b; Say et al., 2014). Sexual risk-taking youth and the extent to which this behaviour may be changing over time have been the focus of a substantial amount of research since the early 1990s (Say et al., 2014). In a study conducted on the health-seeking behaviours of unmarried youth in Ghana, the median age at first intercourse was 17 years for young people of both genders. Sexually initiated males reported an average of 1.8-lifetime partners, whereas females reported 1.4 (Karim et al., 2003). In Ghana, pregnancies among young women are high with their attendant problems (Yussif et al., 2017). Sometimes teenagers die as a result of complications when they have subsequent pregnancies after earlier illegal abortions, while others may fail to utilize health facilities for care due to stigma from the community members, which has implications for the pregnancy and birth outcomes (Afulani, 2015; Bayu et al., 2015).

Age has other impacts on maternity services utilization. For instance, young women were less likely to utilize ANC services in their index pregnancy (Ochako et al., 2011). In the Rufiji District of Tanzania, birth preparedness and knowledge of danger signs of complications were low among mothers aged 20 and younger, and 37 percent of them did not also honour obstetric referrals (Pembe et al., 2010). Older women had more knowledge of danger signs of obstetric complications than younger ones but were more likely to have a homebirth than younger pregnant

women in Bahirdar, Ethiopia, while the reverse was found in another study in Tanzania and Uganda (Abebe et al., 2012; Bayu et al., 2015).

2.5.3 Religion

There is a strong relationship between religion and the utilization of maternal health services (Baral et al., 2012; Gitimu et al., 2015). A literature review of 37 papers related to Sub-Saharan Africa and Australia identified how cultural beliefs, religion, and ideas on pregnancy influenced the utilization of ANC and the final place of delivery (Bazzano et al., 2008; Ford et al., 2007). The evidence available demonstrates that many rural communities' approach to healthcare is culturally premised on their understanding of health, life, and well-being (Coast et al., 2016; Hill et al., 2014). Kamal (2009) found that utilization of SBA among non-Muslim pregnant women was higher than in Muslim women. The religious background of pregnant women influences their beliefs, norms, and values regarding the use of maternal health services. Male dominance in Islamic Religion which constrains women's power and autonomy prevents them from making timely decisions to use SBAs and other maternal health services (Ghuman et al., 2004).

2.5.4 Household Income

Household income has been an important factor in the use of health services by women in low and middle-income countries such as Ghana (Asamoah et al., 2011; D'Angelo et al., 2015). Women are a particularly vulnerable group (both in rural and urban communities) and often do not have adequate access to health facilities due to their weak financial capacity (Ganle et al., 2015b) and high poverty levels (Zere et al., 2012). For example, adolescent expectant mothers in Bangladesh who had no financial savings to afford the cost of using skilled delivery services chose home

delivery (Sarker et al., 2018). Similar findings were reported in different regions of Ethiopia, Uganda and India as precursor to home births (Abebe et al., 2012; Bayu et al., 2015; Kabakyenga et al., 2012). Abrokwah et al. (2014) also pointed out that mothers with National Health Insurance (NHIS) active subscriptions were more likely to utilize approved prenatal care services. However, despite the direct costs of pregnancy and delivery ostensibly being covered by health insurance, other related costs, such as the purchase of in-bed medications and infusions, detergents, and acquisition of standard delivery items (known as birth kits) can be prohibitive, thereby reducing the use of skilled services.

Thus, poorer women are more likely to have access problems, suffer from chronic illnesses, and report low overall Apgar birth scores (new-born baby's health at birth) than their higher-income counterparts (Alison et al., 2013; Sakeah et al., 2014). These differences can be observed when comparing the number of expectant mothers in the highest wealth quintile in Ghana giving birth in a health facility (approximately 92%) to those in the lowest income group, of whom one-fifth gave birth attended by a skilled person (Ganle et al., 2014). Similar outcomes are recorded in Morocco, Mali, and Benin (Witter et al., 2016). In its present state, the insurance situation is unsustainable and failing many mothers. The challenges are so significant that Witter et al. (2013) conclude that there may not be a future for the fee exemption policy for expectant mothers if the problems are not addressed urgently.

2.5.5 Status of women

The concept of patriarchy, men's systematic domination of key structural and ideological resources, and positions institutionalized at multiple levels (such as legal, medical, and political),

underpin many challenges women face in seeking appropriate prenatal care (Amzat, 2015). Despite increasing health education and counselling programmes in many parts of low and middle-income countries, there exists a significant interplay of cultural issues and maternal healthcare-seeking intentions and practices with foundations in patriarchy. Household activities and care of children are perceived as the women's job (Ganle & Dery, 2015), therefore women bear the major share of the household responsibilities in most communities of Sub-Saharan Africa and South Asia (Amzat, 2015; Bishwajit et al., 2017; Ganle & Dery, 2015). However, men champion most decision-making in the household (Amzat, 2015), including accessing healthcare. In Ghana, where men usually have the final say, women who could make independent decisions to go to a health facility and had the means to get there were more likely to give birth at a health facility (Mills et al., 2007). That is, women's autonomy (decision-making power) will influence decisions to utilize professional care, holding other determinants constant (Sakeah et al., 2014b). This reflects the generally low social position of women in Ghana and the family, with significant implications for their autonomy in taking decisions on their pregnancy (Ghose et al., 2017; Sakeah et al., 2014b). Similar outcomes occur in Bangladesh (Ghose et al., 2017). The preference for male children worsens the plight of pregnant women in the Sissala East District, Ghana (Yahaya, 2014).

2.5.6 Parity

Parity like maternal age, and birth order of the pregnancy has been tested in many studies. Generally, women with higher parity especially with no previous complications will be less likely to seek maternal health services compared to those who are primigravida or with fewer children. In a systematic review by Banke-Thomas et al. (2017), it was found that higher parity among young mothers in 32 low- and middle-income countries had a clear and consistently negative impact on

some ANC and PNC services. In a study using DHS data from six African countries parity was found to negatively correlate with the timing of ANC visits. There is a probability that women with high parity will be more experienced and as a consequence, they may feel more comfortable and confident during childbirth and, therefore may consider ANC to be less relevant. Therefore, it is expected that higher parity could negatively be affected by the utilization of ANC across different studies and regions (Agha & Carton, 2011).

Similarly, regarding the birth order and its influence on women's use of maternal health care service facilities during childbirth, Edmonds et al. (2012)) used both qualitative and quantitative approaches to examine factors influencing women's choices of childbirth in health care facilities in Bangladesh. Based on this position, the birth order of the women insignificantly reduced the likelihood of using health facilities during childbirth. On the contrary, in developed countries, a study by Feijen-De Jong et al. (2012) argued that multiparous women were associated with increased use of maternal health care services relative to their nulliparous counterparts. In India, Kesterton et al. (2010) study on the institutional delivery in which two waves of Demographic and Health Surveys were employed, 1992 and 1998, found that women with the list birth order were more likely to use institutional delivery relative to their counterparts with birth order two or more.

2.5.7 Marital Status

Most young women, especially in some African countries, marry early before the age of 18 years (Godha et al., 2016). These marriages are predominately seen in rural areas and among people from low socioeconomic backgrounds. Those who marry early may not utilize ANC. However, the probability of ANC utilization may increase with an increasing numbers of children. Women from urban areas who marry at the age of 18 years and above have a higher adjusted probability of using ANC. Marital status also influences the use of maternal health services. Married women tend to

use more ANC services as well as assisted childbirth. Married women often benefit from the financial support of their spouses. Single women who become pregnant use ANC services less because they have fewer financial resources. They often leave the community to escape the accusatory gaze of society (Samba et al., 2020).

2.5.8 Quality of Care

While skilled birth attendance and emergency obstetric care are widely acknowledged to be essential to combating high maternal mortality, their provision requires functioning health systems that include trained and motivated workers, equipped facilities, and rapid referral systems for complications (Gudu & Addo, 2017; Kruk et al., 2007). These are largely absent in the under-funded health systems of low and middle-income countries (Kruk et al., 2007).

Improving the midwife and expectant mother relationship is paramount to enhancing maternal health service delivery outcomes (Cheptum et al., 2017; Moyer & Mustafa, 2013). In a cross-sectional study in Ghana involving community members, women, and healthcare professionals, home births were often preferred due to a lack of confidence in health staff (Bazzano et al., 2008; D'Ambruoso et al., 2005). Numerous participants recounted receiving harsh treatment by nurses; others described being turned away from the hospital after a difficult journey to reach the facility because they were not yet in active labour. Other studies in different parts of Ghana found nurses yelling at women who may be in pain from complications (Bazzano et al., 2008; Moyer et al., 2014b).

Bowser and Hill (2010) in a study explored disrespect and abuse of women by midwives and found that discriminatory and inhumane behaviour was a major influence on women's decisions about

where to give birth. A similar study in Ghana by Moyer et al. (2016), employing focus group discussions with final year students in 15 Public Midwifery Training Institutions across ten (10) regions, found disrespectful attitudes and abusive behaviours by midwives to be a significant discouragement to pregnant women's skilled care-seeking behaviours and decisions. Disrespect and abuse could take the form of non-dignified care, discrimination based on patient attributes, physical abuse, non-consented care, non-confidential care, abandonment of attention and detention in facilities (Freedman & Kruk, 2014; Rominski et al., 2017). Poor quality of attention continues to be a major concern in most health systems in SSA, as high patient volume and limited resources combine to constrain service provision (Afulani & Moyer, 2016; Cheptum et al., 2018).

Negative staff attitudes may occur as a result of overworking and staff experiencing burnout (Cheptum et al., 2014), inadequate staffing, and inadequate facilities, and equipment (Cheptum et al., 2014; Moyer et al., 2014). In rural Ghana, there are few doctors, with the nearest likely to be found at the district hospital level (Abdullah et al., 2011). For staff to enjoy their work, there should be accessibility to sufficient equipment so that they can provide their services professionally. Inadequate infrastructure such as staff accommodation, the internet, print media, good road network, or other amenities (Cheptum et al 2014) and lack of incentive packages serve as a disincentive to doctors and midwives accepting postings to districts and undeveloped areas (Abdullah et al., 2011; Sakeah et al., 2014b) which compounds the problem. In a rural community, one may not be able to access amenities such as the internet, print media, good road network, or other amenities (Lori et al., 2014), all of which may contribute to a high staff turnover. Similar challenges were found in other studies by Buor (2005) and Cheptum et al., (2014). In a situation where this is a challenge, it may give rise to a lack of interest in their work and fatigue, especially

when they always have to improvise (Sakeah et al., 2014b). Maternity staff at hospitals complained that pregnant women took so long to seek care that they were too ill to be helped by the time they arrived at the facility (Sakeah et al., 2014b).

The literature further observed that women in urban areas had higher (84%) access to quality and professional attention during childbirth than their rural counterparts (43%) (GHS, 2018; Sakeah et al., 2014b). While existing evidence points to the value of skilled maternal health services in promoting safe pregnancy, less than 50 percent of all pregnant women in low and middle-income countries received early antenatal care in 2013 compared to 85 percent in developed countries within the same period (WHO, 2017), due to the present condition of the health settings in many locations. Quality maternal health service delivery is dependent on many factors, ranging from spacious facilities and utilities to logistical capacities. These factors significantly influence the low-skilled service uptake in many low and middle-income countries including Ghana. Whilst educated and wealthy pregnant women and families may travel long distances to utilize services in better health facilities, the poor are unable to do so (Afulani, 2015). For example, Ghana's CHPS initiative has the potential to reduce avoidable morbidities and mortalities of mothers and new-borns, but it is unlikely to achieve this objective due to the deplorable state in which they are and the limited accessibility of the facilities in many rural communities, which encourage pregnant women to prefer unskilled care (Sakeah et al., 2014a).

Issues related to skilled staff deployment, medical equipment, and logistics stocking including the supply of essential medicines, coverage of ambulance services and transportation, and vehicular scarcity remain key barriers to completing the scaling-up of the CHPS programme in the country

(Russell, 2013). The CHPS compounds are located in the remotest communities without access to the services of a health centre and hospital. Ghana Health Service staff at the CHPS facilities depend on the regular source of water supply from the water installations in the community, which may often be compromised. They [health facilities] are usually located on the outskirts of the communities, which deters female nurses from staying in the facility at night, particularly if they are the only staff member in the entire zone (Gudu & Addo, 2017b; Rishworth et al., 2016). The roads are mostly unmotorable all year round. Therefore, the motivation to accept posting to these communities was very minimal, thereby creating persistent staff inadequacies in these health facilities, while the urban health centre remained well-resourced and staffed (Gudu & Addo, 2017b). Given the current perspective which impacts service delivery, there may not be any significant improvement in skilled care in rural communities if these barriers persist over time.

Similarly, quality of care interventions have demonstrated some success in improving some maternal and child health outcomes in low-income countries (Singh et al., 2013). For example, in Ghana, a systems-integrated continuous quality of care intervention deployed through learning collaboratives and quality improvement teams improved skilled delivery and antenatal care coverage and reduced under-five mortality (Singh et al., 2016). A similar quality intervention model deployed in Tanzania and Uganda increased the receipt one of four evidence-based essential interventions for maternal and new-born care (Waiswa et al., 2017). In rural Rwanda, quality intervention strategies including learning collaboratives and mentoring were determined feasible and promising for improving neonatal outcomes (Werdenberg et al., 2018). However, Increase in institutional deliveries in India from 38.7 percent in 2005–2006 to 78.9 percent in 2015–2016 has not translated into commensurate gains in maternal and neonatal survival but has largely shifted the mortality burden from the community to the facilities (Agarwal et al., 2018;

Tunçalp et al., 2015). This has been attributed to low quality of care (QoC) in the facilities and improving the QoC in addition to universal coverage of evidence-based interventions have been identified as a key strategy to achieve Sustainable Development Goals of significantly reducing maternal, foetal and neonatal mortality by 2030 (Chaturvedi et al., 2015).

2.5.9 Preference for Traditional Birth Attendance

Notwithstanding the benefits of skilled maternal healthcare, expectant mothers in many parts of low and middle-income countries continue to prefer obstetric care from Traditional Birth Attendance (TBAs). The reasons for this are complex. Age, education, spiritual beliefs, and community and family attitudes can play a significant role. For example, placental disposal and preferred birth positions can have negative perceptions about birth attendance and the healthcare settings (Bohren et al., 2015; Kelly & Barker, 2016; Moyer et al., 2014) and a preference for herbal uterotonics (an agent used both to induce labour, and to reduce postpartum haemorrhage) forms a major component of TBA services (John & Shantakumari, 2015; Nyeko et al., 2016). Distance to a modern healthcare facility and the occupation of the expectant mother and head of household had significant impacts on the choice of type of birth attendant (Saaka & Iddrisu, 2014; Sarker et al., 2018).

2.6 Neighbourhood Level Determinants of Maternal Health Care Use

Studies on the importance of neighbourhood-level influence on the utilization of reproductive health care services have just recently gained momentum in SSA. However, in most studies, these factors are constituted by aggregating individual-level data to represent neighbourhood characteristics often defined as clusters or PSUs in the case of DHS data (Chama-Chiliba et al.,

2015; Girmaye & Berhan, 2016; Gizachew et al., 2015; Masters et al., 2013). All these studies seek to investigate the effects of both individual and community-level factors and emphasize the importance of considering factors operating at both levels in policy strategies aimed at addressing maternal healthcare use. Multilevel models are thus applied to take care of this two-level hierarchy in the concerned data structures.

A study to examine whether the urban poor experience comparable disadvantages in maternal health care was conducted using DHS data from 23 countries in SSA (Magadi et al., 2003). The study demonstrates the importance of high neighbourhood living standards in influencing the receipt of maternal health care by women. The findings indicate that the urban poor received better ANC and delivery care than the poor in rural areas. The authors, however, suggest that the allocation of health services in Africa does not benefit the urban poor as care provided to the urban poor is worse than that of the urban non-poor. The urban non-poor were less likely to initiate ANC late in pregnancy, make fewer ANC visits to a health facility, and receive non-professional delivery care than the urban poor. Using multilevel modelling, the study depicted significant variations in maternal health in urban areas across countries of SSA. Surprisingly, these variations were not uniform across the countries. According to the authors, the difference in health care for the urban poor is particularly more pronounced in areas where there is relatively better maternal health care suggesting that the urban poor benefit least from improvements in maternal health care.

Effects of neighbourhood socioeconomic disadvantage on health care utilization were also demonstrated by a study carried out by Aremu et al. (2011) in Nigeria. Using multilevel discrete choice analysis modelling, the study revealed a linkage between residing in high socio-economic

disadvantaged neighbourhoods and giving birth at home by women. Patronage of government health institutions was associated with low socioeconomic disadvantage neighbourhoods. Individual-level factors associated with home delivery were high birth order and young maternal age whereas high wealth status, having an occupation, high level of educational attainment, and possession of health insurance was associated with institutional delivery.

Adu et al. (2018) examined the effects of individual-level and community-level factors on the utilization of maternal health services in Ghana using the multilevel modelling approach. They revealed a range of community-level influences on the use of maternal health services in Ghana. The use of maternal health care services during the first trimester was influenced by availability of health facilities while transportation was an important factor that influenced use of ANC for four or more times. Distance from the health facility was a significant barrier for delivery at the health facility and delivery assistance by trained medical personnel. There was contextual influence in the use of maternal health services because women's odds of using antenatal care during the first trimester and for more than four times during pregnancy, institutional delivery and delivery assistance by a trained medical personnel were strongly influenced by the practices of others in areas of residence, and by living in close proximity to people with secondary or higher education. Although household poverty and personal problems were negatively related to use of ANC, institutional delivery and delivery assistance, the area level factors explained a greater proportion of the variation in delivery care than ANC.

2.7 Gaps in Existing Literature

The most commonly studied determinants of maternal health (MH) service utilization are socioeconomic factors, with income/wealth measures and place of residence as proxies for access. Further studies are, however, needed to adequately measure the effect of access and to answer questions like how far women are willing to travel for maternal health services, either on foot or by other means of transportation. A study in rural Zambia found that the effect of distance became significant beyond 12 km with no difference in the use of facility delivery between those living 6-11 km from a basic emergency obstetric care facility and those living within 5km (Ensor et al., 2014). Tweheyo et al., (2010) in Uganda however found that living more than 5km from a health facility decreased the use of facilities for delivery. Such findings suggest the effects of distance are context and outcome-specific, hence the need for more such studies for local programme development.

In addition, most of the studies reviewed concentrated on women in general and failed to address the special needs of young women. Young women are a key constituency in efforts toward reducing maternal mortality in developing countries. Most studies that investigated individual/household and contextual-level influences did so in single country settings, but a few did so with several countries at a time. Such studies examined the effect of one aspect of the context on maternal health care utilization, such as the influence of quality of health care (Afulani et al., 2015; Glei et al., 2003; Sovd et al., 2006), access to health care (Hanson et al., 2017; Nuamah et al., 2019) and socio-economic development (Aremu et al., 2011; Yaya et al., 2018). It is important to note that there is no singular contextual effect on the use of maternal health services (Stephenson et al., 2006).

Moreover, while we know that women are concerned about quality from qualitative studies, (Afulani, 2016; Amooti-Kaguna & Nuwaha, 2000; Moyer et al., 2013; Ozge et al., 2012), there is a need for studies that measure how quality affects the use of services, and also especially which aspects of quality are most predictive of service utilization. A major gap in the literature on the determinants of maternal health service utilization is studies that explore the mechanisms through which various distal determinants like socioeconomic status may affect service utilization. For instance, how does education or economic status interact with the cost of maternal health services, distance, and perception of quality? A study in Bangladesh found that among those living more than one hour travel time from a health centre, women who were employed were more likely to seek care, but there was no difference by employment status for those living within one-hour travel time, suggesting that employed women are better equipped to overcome physical access barriers (Rahman, 2012). Furthermore, there is a gap in studies in SSA that examine regional variability in the use of SBAs (Moyer & Mustafa, 2013a).

Among studies that investigated contextual-level influences on maternal health care utilization, only a few explored the interaction effects of contextual-level variables and their relationship between individual-level variables and maternal health utilization. Both contextual and individual-level characteristics have been found to influence each other in dynamic ways that can modify how they influence health-seeking behaviour (Schreier & Chen, 2013). It is, therefore, critical to examine if contextual-level characteristics in this study do moderate the association between individual-level characteristics, and young women's utilization of maternal health care in Ghana. This study addresses this research gap allowing for more complete tests of theories on multilevel modelling. This approach provides evidence on which contextual-level aspects can be targeted for

policy intervention. This is an effective method as most of the maternal health policy interventions that influence maternal health behaviour are implemented at the community level.

Finally, there is the question of whether utilization improves outcomes in all settings. There have been calls to examine the quality of institutional care, as increased coverage for use of health facilities for delivery, in many countries, does not seem to be associated with proportionate reductions in maternal mortality (Friberg et al., 2010; Graham & Varghese, 2012). A recent WHO study also found that high coverage for essential interventions within health facilities was not necessarily associated with reduced institutional maternal deaths; calling for a move beyond essential interventions (Souza et al., 2013). These findings suggest a need for research on maternal health service utilization, quality, and outcome.

This study would provide important information on the influence of quality of maternal health care and barriers to health care access on young women's utilization of maternal health care and pregnancy outcome in Ghana. It would provide direction on where maternal health interventions should be focused to improve the utilization of maternal health care services by young women. Such information would provide a basis for informed programming intended to improve the utilization of maternal health services by young women. This study used the nationally representative 2017 Ghana Maternal Health Survey (GMHS) data to quantify both individual/household and contextual-level influences on young women's utilization of maternal health services. The use of multilevel modelling techniques in this study provided a more rigorous analysis of the relationship between individual/household and contextual variables, and maternal health care utilization by young women in Ghana.

2.8 Theoretical Models and Framework

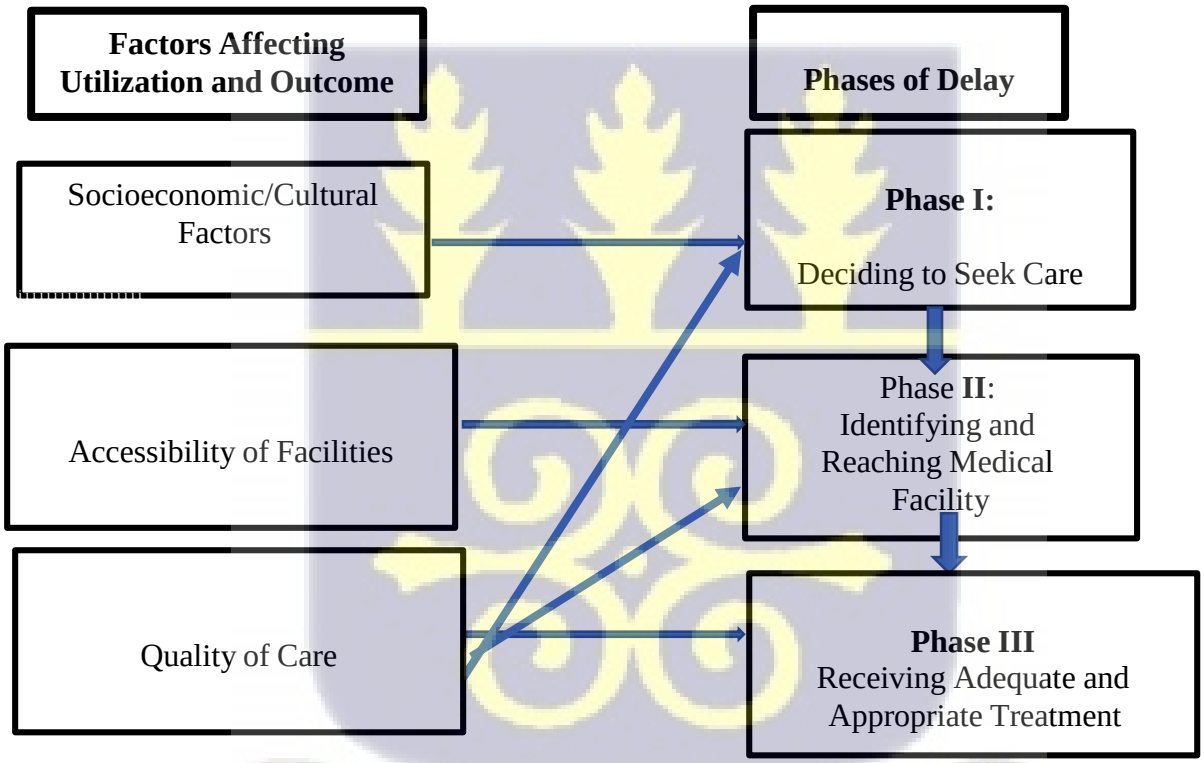
The utilization of maternal health care services is a complex behavioural phenomenon. An amalgam of factors including quality of care, culture, socioeconomics, access, perceptions, knowledge, belief in efficacy, age, gender roles, and social roles among others influence both the choice to seek health care and utilize healthcare facilities for prevention and treatment of illness (World Health Organization, 2010). To facilitate the understanding of the factors that affect the utilization of maternal health care services and pregnancy outcomes among young women in Ghana, three models were used to guide the study. These were Thaddeus and Maine's (1994) Three Delays Model, Andersen's (1973) Health Behaviour Model, and Donabedian's (1966) Quality of Care Model.

2.8.1 The three Delays Model

This is the most popular of the models that explain the factors affecting the use of maternal health care services and maternal mortality in developing countries (Combs et al., 2012; El-Gelany et al., 2015; Mohammed et al., 2011; Shah et al., 2009; Win et al., 2015). It was developed from the work of the prevention of maternal mortality programme, a collaborative effort of the Columbia University Centre for Population and Family Health, and multidisciplinary teams of researchers from Ghana, Nigeria, and Sierra Leone (Thaddeus & Maine, 1994). The model reflects the factors that influence the period between the beginning and the outcome of an obstetric complication. The justification for focusing on this period was that about 75 percent of maternal mortality is caused by five direct obstetric complications, which are difficult to predict, and can occur in women with no prior risk factors; but the technology to treat these complications is available. Thus, most deaths from obstetric complications can be prevented with prompt medical care (WHO, 2016). The main

premise of the model is that promotion of adequate treatment will result in satisfactory outcomes, while delayed treatment will lead to adverse outcomes (Thaddeus & Maine, 1994). The three delays model postulates three (3) phases of delays that contribute to adverse pregnancy outcomes, from the onset of complications to treatment. Each phase is influenced by one or more of three groups of factors: socioeconomic/cultural factors, accessibility of health facilities, and quality of care as presented in Figure 2.2.

Figure 2.2 The Three Delays Model



Source: Thaddeus & Maine (1994)

Socioeconomic factors include women's status, and the economic and educational status of the woman, her partner, or family. Accessibility factors include physical accessibility (availability and

distance to health facilities; availability and type of transportation; condition of roads, and geography of the area); and financial accessibility (costs of transportation and health services). *Quality of care* includes factors such as the availability of competent and motivated personnel, essential drugs, supplies, equipment, etc. Phase I delay is the delay in the decision to seek care and is influenced by all three groups of factors.

However, it is perceived (rather than actual) accessibility and quality of care that influence the decision to seek care. Phase II delay is the delay in identifying and reaching a health facility and is influenced by actual accessibility factors. Phase III delay is the delay in receiving adequate and appropriate care at the health facility and is influenced by the actual quality of care (Thaddeus and Maine 1994).

2.8.2 Posited Relationships and underlying Mechanisms for the Key Constructs

2.8.2.1 Socioeconomic/cultural factors.

Women's status: This is described as the educational, cultural, economic, legal, and political position of women in a given society (Thaddeus & Maine, 1994). The decision to seek care is made by the individual woman and/or her family, but a woman's informal power in the household influences whether she has a say and can act on her preference (Thaddeus & Main, 1994). Women's status affects the first delay in specific ways. First, constraints on women's autonomy limit their access to care through the decision-making power, for example, instances where women cannot go to the hospital without the permission of their husbands or other family elders, even when there is an obvious need for hospital care (Abasiekong, 1981).

Second, women's mobility may be limited by cultural restrictions on travel outside the community (Kloos et al., 1987). Furthermore, women's status may be tied to access to transportation; and control over resources needed to pay for expenses (Salway & Furuta, 2006). The expectation is that higher status of women will decrease delays in the decision to seek care (Thaddeus & Maine 1994).

Higher economic status is expected to reduce the first delay. The mechanism underlying this construct is unclear, but the following are suggested: Because care-seeking includes costs of transportation; cost to receive care, and opportunity costs for lost time from work; higher economic status facilitates the decision to seek care by removing cost as a barrier (Thaddeus & Maine, 1994). Also, households with higher economic status may be more "modern", hence more receptive to modern health care services (Navaneetham & Dharmalingam, 2002); and health facilities serving people of higher economic status may be more appealing, thereby increasing their use (Thaddeus & Maine, 1994).

The mechanism underlying the effect of education is also unclear, though it is expected to reduce the first delay (Thaddeus & Maine, 1994). Drawing on the work of Caldwell et al (1979), Thaddeus and Maine suggest that education may facilitate the decision to seek care by increasing access to information and knowledge, which shapes their thought patterns in favour of medical care (as against fatalistic views). Education may also introduce people to a new 'modern' culture that favours the use of medical services; and increases self-confidence and respect, which facilitates the decision to seek care (Caldwell., 1979; Caldwell & Caldwell, 1985). Education and

economic status are intricately related, and also related to women's status making it difficult to analyze their individual mechanisms (Thaddeus & Maine, 1994).

Illness factors: These refer to the women's health condition (e.g., a pregnancy complication), ability to recognize a complication (knowledge of risk factors and danger signs in pregnancy), and perceptions of the etiology and severity of the condition (Thaddeus & Maine, 1994). These factors influence the perception of need which influences the decision to seek care. The expectation is that women and families are more likely to seek care if they recognize a complication, and perceive it as severe, and its etiology as requiring biomedical intervention (Thaddeus & Maine, 1994). These processes are, however, shaped by sociocultural factors. For instance, labour that lasts up to a day may be considered normal, and so is not recognized as dangerous in some communities (Sargent, 1985). On the other hand, prolonged obstructed labour may be recognized as abnormal, but taken to be a sign of the woman's infidelity, hence not requiring medical care, but rather a confession for labour to progress (Senah, 2003; Thaddeus & Maine, 1994).

Another factor is the sociolegal issues. These refer to circumstances that recognize a health problem, yet care may not be sought because of the fear of social and legal penalties; or where a situation is considered to be socially stigmatized or disgraceful such that, though recognized as serious, women do not seek appropriate care because of fear of punishment and ostracism. Delayed care seeking for complications due to induced abortion is a good example (Thaddeus & Maine, 1994).

2.8.2.2 Accessibility factors

Distance and transportation to health services exert a dual influence on use: first as discouragement in seeking treatment and second as a real barrier to care. Women who are pregnant may not strive to reach a delivery facility if they believe the facility is too far. This is especially so when labour sets in at night and there is no ready means of transport, which means walking several kilometres. For those trying to reach a far-off facility with poor transportation, they may reach facilities very late or fail to reach, as some with serious complications may die en route (Thaddeus & Maine, 1994).

On the other hand, the cost of transportation and services, and the opportunity cost from lost time at work including that by people who accompany women to the facilities. Cost also has a dual role: as a disincentive to seeking care and as an actual obstacle to reaching and receiving care. Families may not seek care if they perceive the cost of transportation and care to be above what they can afford. The cost of good transportation may also lead to delays in reaching and receiving care after the decision to seek care is made (Thaddeus & Maine, 1994). Witter and Adjei (2007) mentioned that lack of transport, cost, and long-distance to a facility are issues that can affect one's decision to use health care. These factors can be influenced by the location and distribution of health facilities. According to Adisasmita et al. (2008), Cham et al. (2005), and Gulliford et al. (2002), when there is an obstetric emergency, women in rural areas are most likely to face challenges of how to reach a health facility for the assistance of skilled personnel. These situations mostly confront women who are in poor families; those who live in areas with bad roads; and in some cases, the decision for a woman to seek health care is made either by the head of the family or the husband. All these circumstances will delay the women from seeking health care on time and this could sometimes lead to the death of the woman (Cham et al., 2005; Gulliford et al., 2002). Lori

and Starke (2012) stated that long distance for women to access health facilities during pregnancy leads to high mortality and morbidity. According to them, women who are poor in urban areas could also have difficulty accessing health care due to the inability to pay even when the health facility is close to them.

Das et al. (2010) and Lori and Starke (2012) argue that in rural areas when the women even have money to pay for their transport and health care, because the roads are bad and unmotorable, vehicles and other means of transport may not be available. These women in the time of emergency will either use unsafe routes or walk which will delay them from seeking health care on time. According to Das et al. (2010) and Lori and Starke (2012), the earlier women reach a health facility, mostly within four hours, the better the outcome of their health condition.

2.8.2.3 Quality of care

Quality of care also plays a dual role. Perceived quality of care influences the decision to seek care, while the actual quality of care affects the timely receipt of appropriate care once a woman reaches a health facility. Perceived quality is subjective and is related to people's assessment of service delivery, based on their own prior experience with the health system or that of people they know. The assessment of quality may be based on the service received, hospital procedures, availability of supplies, waiting times, staff attitudes; or the outcome of care based on the effectiveness of treatment. Perceptions of quality may also be due to conflicts of the medical 'culture' with that of the woman, in issues such as privacy, presence of family members during labour, and birthing position. The actual quality of care at the health facility determines the outcome and depends on the availability of competent personnel with enough drugs, supplies, and equipment, to adequately

diagnose and provide timely treatment. The actual quality of care may only partly overlap with perceived quality (Thaddeus & Maine, 1994).

According to Niermeyer (2016), sometimes when women struggle to reach health facilities, their conditions become worse, and care provided on some occasions is not successful. This could be attributed to inadequate skilled service providers, poor attitude of staff, lack or improper policies at the facilities directing what needs to be done during an emergency, and lack of essential logistics for maternal health care (Gohou et al., 2004; Niermeyer, 2016; Pacheco et al., 2014). Studies conducted by Essendi et al. (2011) and Waiswa et al. (2015) revealed that when the need arises for emergency surgery, the time between the decision and the start of the surgery exceeds 30 minutes. Pirkle et al., (2011) reported that the sub-standard health care provided at tertiary health facilities mostly in low-income countries directly and indirectly leads to maternal mortality. According to Killewo et al. (2006), sub-standard health care could affect the decision of women to use SBAs on time when the need arises. The model provides powerful information to policymakers and health care providers within the context of maternal health care and the kind of interventions that need to be implemented to reduce maternal mortality.

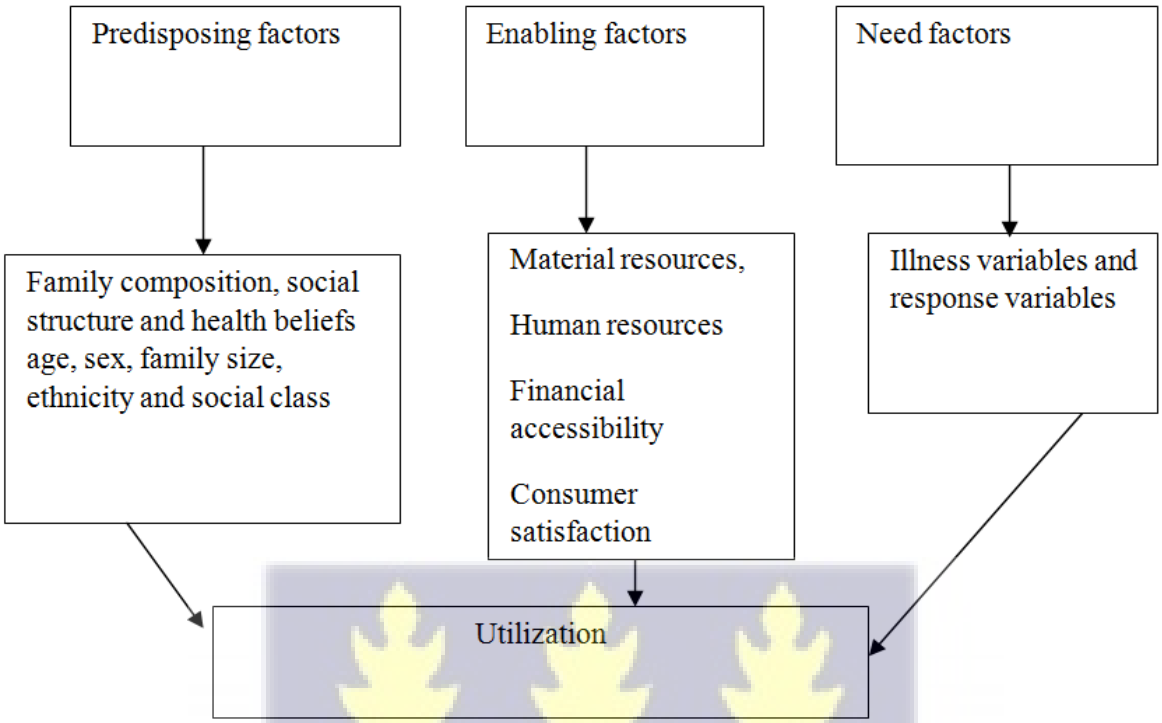
2.8.3 The Behavioural Health Model

Andersen and Newman's (1973) behavioural framework of health service utilization was established for the empirical test of unfair access to health services in the United States. This model discusses the problem that certain sections of society, especially ethnic minority communities, those living in poverty, people living in inner cities, and rural residents receive less health care services than other population groups (Andersen & Newman, 1973). The model sees

access to services by individuals based on individual decisions that are limited by their position in society (age, gender, education, employment, level of awareness, and position at home) and the availability of health care services. Initially, this model focused on the family as the unit of analysis to develop policies related to how families utilize health care services and evaluate fair access to health services (Andersen & Newman, 1973). Andersen in 1995 updated the model focusing on the individual as the unit of analysis.

According to Andersen and Newman (1973), the model contains three sets of predictive factors predisposing factors, enabling factors, and need factors. The model describes a series of factors within these three factors which determine the utilization of health services. Andersen and Newman (1973), Ulrich (1998), and Andersen (1995) stated that individual factors (such as age, education, income, level of awareness, ethnicity, decision making) and community environment (external environment, health care system, culture, and tradition) affect health service use. The model outlines that certain factors limit utilization of the health service while other factors enable service use. The description of the series of factors described in Andersen and Newman's (1993) model for service utilization is shown in Figure 2.3.

Figure 2.3: The Behavioural Model of Health Services Utilization



Source: Andersen and Newman, (1995)

Predisposing Factors- these are the sociocultural characteristics of the individuals that exist before illness, for example, cultural and traditional beliefs and decision-making in health service utilization. According to this model, the following factors are included in predisposing factors that affect service use (Anderson, 1995):

Social structure- education, occupation, ethnicity, social networks, social interactions, and culture are important factors in health service use (Anderson, 1995). Less educated, unemployed, rural, and poor women (including lower caste or ethnic groups of women) are less likely to use skilled delivery care than women with more advantages (Aigbe, 2011).

Health beliefs- peoples' health-related attitudes, values, and knowledge concerning the health care system (Andersen, 1995). The cultural and traditional beliefs towards pregnancy and childbirth, including women's autonomy in decision making, may impact health service use.

Demographic factors- age, sex, and gender roles also influence the use of health services and decisions on health-seeking behaviour (Andersen, 1995b; Nitai et al., 2003).

Enabling factors- the following factors are included in enabling factors for health service utilization (Aigbe, 2011; Andersen, 1995):

Personal/Family- access to health services, women's income, husband's employment, health insurance status, availability of care, travel options, extent, and quality of social relationships all influence service utilization.

Community- community influence, e. g., available health personnel and facilities, time is taken to reach a health facility, waiting times, and health system-related factors influence health service use (Andersen, 1995a; Morrison et al., 2014).

Need factors: the need is one of the most immediate causes of health service use (Amin et al., 2010; Andersen, 1995):

Perceived need- how people perceive their general health situation and need for skilled care use. How do they experience symptoms of illness, pain, and worries about their health? How they judge their problem and whether they see the need to seek professional help (Andersen, 1995).

Evaluated need- professional judgment (for example, suggestions from doctors and nurses) about people's health status and need for health service utilization (Andersen, 1995).

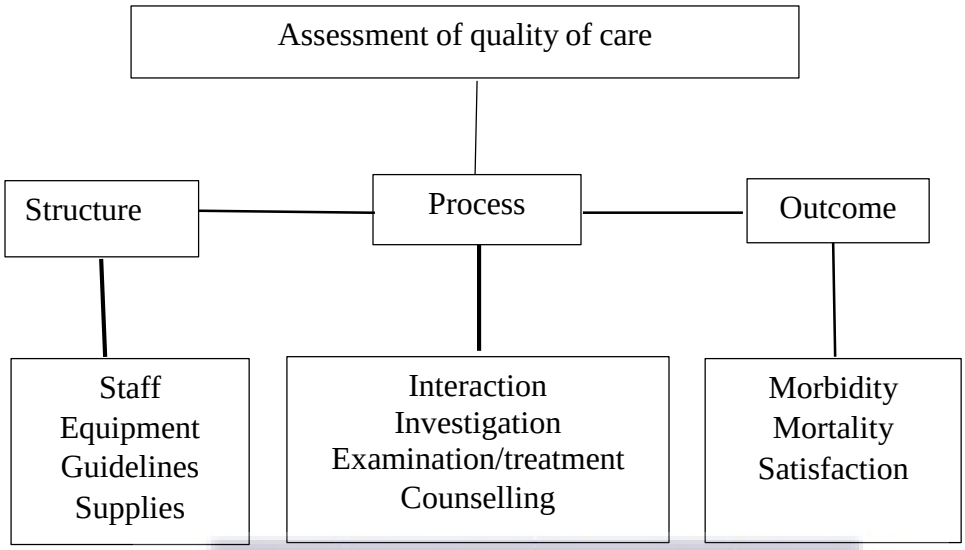
2.8.3.1 Linkages and Relationships

Several studies have used the BHM framework to investigate the determinants of health care utilization (Glei et al., 2003; Haas et al., 2004; Kirby & Kaneda, 2005). For example, a study carried out to examine factors linked with the use of biomedical care in Guatemala used the BHM with minor adaptations to provide an organizational structure for the determinants of pregnancy care (Glei et al., 2003). In the United States of America (USA), Haas et al. (2004) used the behavioural model and expanded it to incorporate contextual indicators in addition to individual characteristics. The study provided a broader viewpoint on the probable causes of the tenacious racial/ethnic dissimilarities in access to health care in the USA. A study by Kirby and Kaneda (2005) in the USA also uses the BHM model as a theoretical base to understand the determinants of health care utilization. The authors modified the model to include the context of neighbourhood socioeconomic disadvantage in addition to individual-level characteristics.

2.8.4 Donabedian's Quality of Health Model

Donabedian's (1966) model of structure, process, and outcome (SPO) offers an explanatory framework that is used to assess health services systems, measure and evaluate the quality of healthcare and give an insight into the factors that account for satisfaction or dissatisfaction among clients. Several researchers have applied the SPO framework to examine maternal health care quality, suggesting it is an appropriate framework for assessing processes and outcomes (Clarice & Oyugi, 2018; Shourab et al., 2013; Lindmark & Langhoff-Roos, 2004; Sword et al., 2012). The framework describes structures, processes, and outcomes of care as three categories of variables that may impact the quality of care as in Figure 2.4.

Figure 2.4 Donabedian's **model for assessment of quality of care**



Source: Donabedian, 1988

Structures refer to the organization, patient characteristics, the availability and financing of health system resources, and environmental factors such as those related to the economic, social, and physical environment. Processes include all the technical and interpersonal interactions between patients, providers, and other healthcare actors. Measurement of process, the interaction between caregivers and patients, is becoming increasingly more common. Process evaluation has great potential, as every visit to a provider can be measured (Donabedian, 1988). The private nature of physician-patient encounters, lack of process assessment requirements, and absence of important measuring instruments restrict the researcher's capacity to evaluate processes (Peabody et al., 2004). Despite these difficulties, research suggests that process measures contribute to improved health outcomes. Combining the universality, measurability, and connection with health outcomes, 'process' has become the preferred method of measuring quality.

Finally, outcomes include the consequences of healthcare on individual patients or patient populations. Structures, processes, and outcomes of care are unidirectionally associated with one another, as structures influence processes and processes influence outcomes of care (Begley et al., 2004; Donabedian, 1988).

In Ghana, the Gambia, India, and Thailand the results of pregnancy (mother alive despite foetal loss or having a live and healthy baby) are said to affect women's satisfaction with the quality of maternal care services (Srivastava et al., 2015). Successful maternal outcomes despite birth complications where both mother and new-born survived affected women's overall satisfaction with the quality of care services in Nairobi, Kenya (Bazant & Koenig, 2009). Birth complications are related to satisfaction. In the Amhara Region of Ethiopia, 57 women, representing 13 percent that delivered with complications were not satisfied with the quality of overall service delivery compared to 32 women, representing about 8 percent that delivered with no complications (Tayelgn et al., 2011). This satisfaction is attributed to the survival of both mother and new-born (Bazant & Koenig, 2009).

2.8.5 Key Concepts of Health Care Utilization Models

The factors that influence healthcare-seeking behaviour that came out from the models and theories reviewed, were demographic variables, healthcare access, culture social networks, and quality of care. Access is the ability of the individual to reach and obtain services. According to the Ghana Health Service (2018), the components of access to services include geographical, financial, organizational, and socio-cultural variables.

Geographical access is the ability of individuals who need health care to reach where the appropriate services are available. The factors that determine geographical accessibility are the location of the health facility, distance, availability of transport, and travel time.

Financial accessibility is the ability of the individuals who need health services to pay for the services that will be rendered to them. Two main issues spring forth for consideration: either the person has physical cash to fund his/her health service or the person's health service will be funded since he/she is an active subscriber of the NHIS. The financial accessibility to health care can be determined by assessing the levels of the fees, clients' income levels, the facility or government policies, and payment mechanisms available at the health facility.

Lowe et al. (2016) stated that pregnant women in The Gambia work in the field until the day of delivery. The reasons are that it is a common practice, which is accepted by both men and women in the country. Again, the women are very poor and as a result, they have to work every day to have money for their needs. This makes it difficult for women to pay for transport when there is a need to access health care. Even when the women are sick, they have to pay for their medical expenses themselves. The women have limited control over resources in their marital homes.

Similarly, a study on adolescent maternal health care seeking services in Uganda found that respondents were discouraged from seeking ANC and delivery services because of rude and abusive health workers, with physical abuse being reported by some adolescent mothers in labour. Among this group of women, the perception of good quality of care included having empathy from the health workers (Atuyambe et al., 2009). In another study in Uganda, women reported that health workers in hospitals were insensitive to their pain and were unable to communicate their pains to health workers who did not offer a sympathetic response. This study described the feelings of rural women towards health workers, who were said to be, "…rude, poorly trained and unwilling to dispense drugs" (Kyomuhendo, 2003). They were also said to deliberately avoid maternity patients, abandon them in critical situations, expect to be bribed, give false information,

and lack ethics. Most mothers in this study reported only going to the hospital or health centre in emergencies to avoid having embarrassing questions asked of them, not being able to deliver in their preferred position, and not having their pain dismissed (Kyomuhendo, 2003).

The current study is based on the three delays, Andersen's Behavioural Model (BM) and Donabedian's quality of care model. These models are appropriate for this study because they have been used in many studies investigating factors that influence the quality and utilization of healthcare services (Austin et al., 2014; Azfredrick, 2016; Mengesha et al., 2013; Rutaremwa et al., 2015; Sudhinaraset et al., 2017; Tesfaye et al, 2018). The utilization of maternal health care services varied greatly by demographic and socio-economic characteristics as explained by Mengesha et al. (2013).

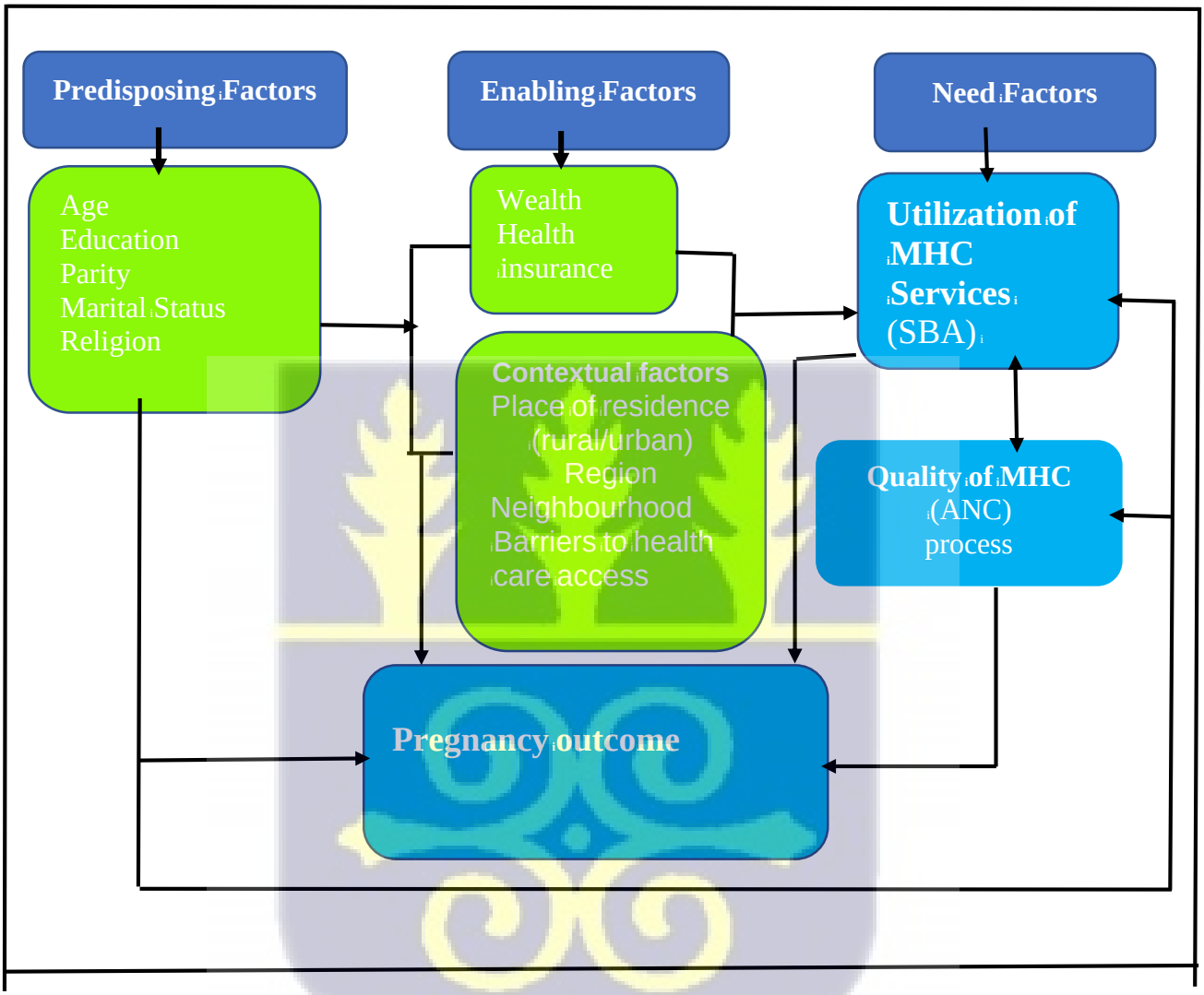
2.9 Conceptual Framework for the Study

Based on the literature reviewed including the theories of the utilization of health services and empirical studies, a conceptual framework was developed to graphically explain the key factors or determinants of utilization of maternal healthcare and pregnancy outcomes and the presumed relationships among them. The conceptual framework was developed based on the three delays by Thaddeus and Maine (1994), Anderson's (1973) Behavioural model of the determinants of health service utilization, and Donabedian's (1966) model of quality care.

The components of the models have been combined in an integrated and holistic way with knowledge from empirical studies into a framework that attempts to predict determinants of the utilization of maternal health care services and pregnancy outcomes (quality ANC, SBAs

pregnancy outcomes, the dependent variables of the study). The conceptual framework is shown in Figure 2.5.

Figure 2.5 Conceptual Framework illustrating the Determinants of health Care Utilization among Young Women and Pregnancy Outcomes.



Source: Adapted and Modified from Anderson (1995) and Donabedian (1988)

2.9.1 Predisposing Factors

The predisposing factors consist of individual factors. The individual factors include socio-demographic characteristics such as age, education, parity, marital status, and religion. These factors are thought to be predisposing conditions for the enabling factors. The enabling factors are based on the argument that even if a woman has a predisposition to use health services, certain characteristics must be in place to enable them to access the services. Without the ability to access services, a predisposition will not necessarily translate into utilization.

2.9.2 Enabling Factors

The components of the enabling factors are individual and contextual factors. The individual financing factors include income, socio-economic status, wealth, and health insurance status. The contextual factors consist of the type of place (rural/urban) and region of residence. Finally, for a health service to be used, there must first be a need to use that service. Therefore, need factors were included in the model.

2.9.3 Need Factors

There are two types of need factors. These are illness variables and response variables (Andersen, 1968). Not only must the women recognize that there is an illness, but they must also respond appropriately to access services. This will enhance the quality of life and will provide a buffer against adverse life events. Promotion of delivery at health facilities requires approaches that consider women's social situation since factors influencing maternal health-seeking behaviour among young women differ from elderly women (Atuyambe et al., 2008).

The need factors are grouped into individual and neighbourhood variables. The individual factors include the perceived need for health services. The perceived need explains how pregnant women view and experience their general health and functional state. The evaluated need in the context of this study is ANC attendance and the need for SBAs. ANC attendance and use of SBAs will help to prevent the incidence of adverse pregnancy outcomes among young pregnant women.

The main premise of the framework proposed is that:

(i) Good quality maternal health care is essential for good maternal health outcomes (Graham et al., 2013; Graham & Varghese, 2012);

(ii) The decision to use Maternal Health (MH) services is based on the need for care, accessibility (financial), and the quality of care.

(iii) Once the decision to use care has been made, it is actual accessibility that affects utilization.

(iv) The use of maternal health services and pregnancy outcomes are influenced by factors at various levels: predisposing factors (individual) and enabling factors (family and contextual).

Similarly, from the conceptual framework, the predisposing elements involve elements functioning at the individual/household level such as maternal age, education, parity, religion, and marital status which affect maternal health-seeking behaviour and pregnancy outcomes (outcome variables). Likewise, these predisposing factors can also mediate the enabling factors to influence healthcare-seeking behaviour outcomes. The framework recognized that neighbourhood variables, including the region of residence, and type of place of residence (urban and rural), can have

independent effects on the dependent variables and quality of maternal health care. Furthermore, the conceptual framework shows that a fusion of both the predisposing and enabling factors will affect the outcome variables. In the same way, quality of care is influenced by all the factors including predisposing factors and enabling factors.

The quality of ANC and use of SBAs in the framework have been recognized to directly impact pregnancy outcomes and some literature reviews also indicate that it does sometimes operate through individual-level factors to influence pregnancy outcomes (Dickson & Amu, 2017a; Freedman & Kruk, 2014; Krugu et al., 2017; Mselle et al., 2013; Sepehri et al., 2008). Depending on the nature of the study, different levels of influence can also be considered including clusters, neighbourhood, and regions (Babalola, 2014; Ensor et al., 2014).

Quality of ANC is measured using the principal component analysis based on proxies such as blood sample taken, a urine sample taken, being weighed, blood pressure checked, education received on signs of pregnancy complications; education received on where to go if they developed a complication; received or told to buy iron supplements; received an anthelminthic; and tetanus vaccination. This is described extensively in the methodology.

2.10 Study Hypotheses

1. There is a significant association between socioeconomic status and living in an urban area and better quality of antenatal care.
2. A significant and positive relationship exists between neighbourhood-level variables and young women's utilization of skilled birth attendance in Ghana.

3. Neighbourhood factors are more significant predictors of exposure to adverse pregnancy outcomes than individual factors among young women in Ghana.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the overall research design and procedure for investigating factors influencing maternal health service utilization and pregnancy outcomes among young women in Ghana. Thus, exploring these can be achieved by exploring the research approach that is used to carry out the study. This involves a description of the data and analysis.

3.2 Data Source and Sample Selection

The study employed secondary data to answer the research questions. The study adopted and used the Ghana Maternal Health Survey (GMHS) 2017 which is publicly available to assist in answering the research questions (GSS, GHS, & ICF, 2018).

The 2017 Ghana Maternal Health Survey (GMHS) is the second in the series and is designed to collect data on maternal health and mortality in the country. It is designed such that the data collected were nationally representative. In collaboration with Macro International, the survey was conducted by the Ghana Statistical Service and Ghana Health Service. The primary objective of the survey was to generate data on maternal health and mortality for policymakers and the research community involved in Reducing Maternal Morbidity and Mortality.

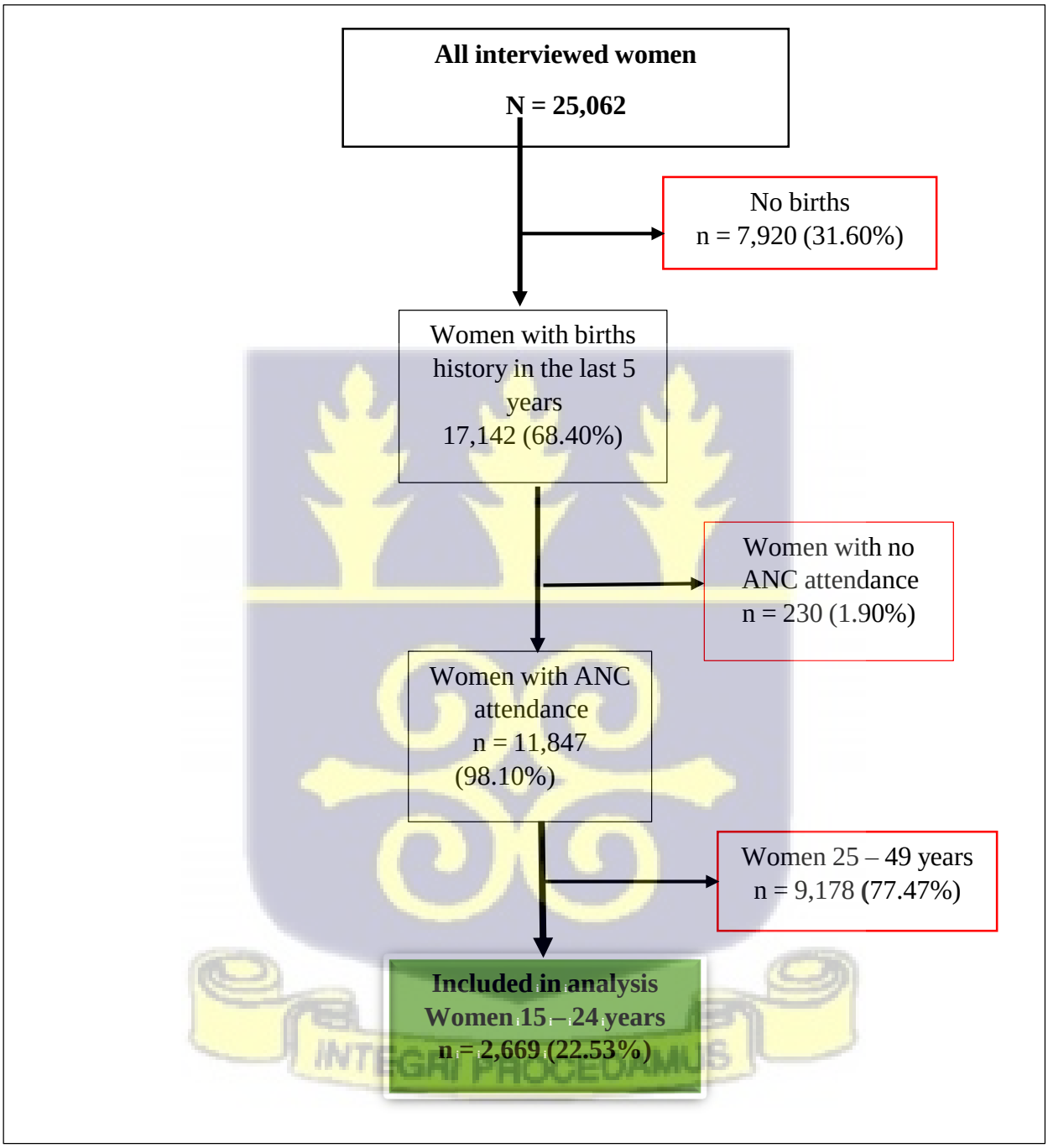
The 2017 GMHS was a nationally representative survey of women of reproductive age. The total sample included 27,000 women, made up of 30 households from each cluster. A two-stage sampling strategy was adopted for the survey. In the first stage, 900 Enumeration Areas (EAs) (466 EAs in urban areas and 434 EAs in rural areas) were selected with probability proportional to

size from all regions of the country. The sampling frame used for the 2017 GMHS is based on the 2010 Population and Housing Census (PHC) conducted in Ghana. In the second stage, a complete listing of housing units was prepared for each of the selected clusters. After that, using systematic sampling, 27,000 housing units were selected for the survey. During fieldwork, 26,500 housing units were found to be occupied. In these households, 25,304 women were eligible for interviews, and 25,062 representing 99 percent completed interviews.

Questionnaires were prepared in English and translated into three languages; Akan, Ga, and Ewe. Four-week training was conducted for interviewers, supervisors, and field editors by the Ghana Statistical Service (GSS) and Macro International. The survey questionnaire included sections on pregnancy history, family planning, pregnancy, and postnatal care and for most recent live birth or stillbirth, abortion, miscarriage, marriage, and sexual activity, adult and maternal mortality and health care access, insurance, and disability. The second stage also included the administration of a Verbal Autopsy Questionnaire (VAQ) in all households with deaths of women aged 12 – 49 years in the five years before the survey in stage 1. This was meant to identify the specific causes of death. The VAQ involved 1,240 women aged 12 to 49 years. For this study, the study population is women of 15 to 24 years referred to in this study as "young women". A total of 25,062 women were interviewed of which about 37 percent (9,173) were young women aged 15 to 24 years. The analytical sample is, however, 2,669 young women (10.6% of the base sample). This is because the study is on young women between the age of 15 – 24 years and since it is impossible to examine the quality of care for young women who did not have any encounter with the health system, the main sample for all three is limited to young women who attended at least one ANC visit during their pregnancy of the full analytic sample, to be able to adequately examine the

determinants and effects of quality on ANC. The flowchart in Figure 3.1 illustrates the selection criteria used to select the study respondents.

Figure 3.1 Sample Selection Criteria



The 2017 GMHS provides individual household and contextual data. Individual and household-level data used for analysis includes socio-economic and demographic information about individual respondents. The survey provides household data on ownership of durable household assets and household amenities. Contextual data provided by the survey consist of reproductive health care services given to women during ANC, delivery of the child, and birth outcome.

3.3 Construction of Study Variables

3.3.1 Dependent (outcome) Variables

The selection of the dependent variables was occasioned by their importance in the prevention of adverse maternal health outcomes and to answer the research questions:

i. what are the factors that affect the quality of ANC service utilization among young women in Ghana?
ii. what factors determine the utilization of skilled birth attendance among young women in Ghana?
iii. to what extent do the quality of care and skilled birth attendance affect pregnancy outcomes among young women in Ghana?

The dependent variables include quality antenatal care, skilled birth attendance, and pregnancy outcomes.

The first dependent variable is the quality of antenatal care received by young women in Ghana. With the GMHS, the quality of ANC is operationalized by an additive index created from a count of twelve (12) questions about the specific services they had received during each prenatal care visit during their last pregnancy. The services include weighing, checking blood pressure, taking a urine sample, and blood sample; learning about the indications of pregnancy complications;

learning where to go in cases where problems have arisen; receiving or advised to purchase iron supplements; an anthelminthic received; tetanus immunization; taken drug for intestinal parasites; antenatal visits and trimester of ANC visit. A binary answer for each issue (1=Yes, and 0=No) was provided (see appendix 3 for the exact wording of the questions). Each response was coded as 2 if a specific service was received and 0 otherwise. For antenatal visits and trimester of ANC visit, women who had four visits or more visits were coded as '2' and less than 4 was coded '0', and those who started their ANC visit during the first trimester was coded '2' and from second and third trimester coded '0'. Following the summative index, an index was created to measure the quality of prenatal care.

The score is from zero to 24 and responses cover the whole continuum; the mean is 19.40. The untransformed variable had a normal distribution hence the decision to use the index as dichotomized and examined as a binary variable (coded: 0 - received 0 to 19 services and 1- received 20 to 24 services) for the analysis of the determinants of ANC quality. The quality ANC index was then categorized into two: Low and High. All scores less than 20 were categorized under the low-quality ANC index and those with scores of 20 or more were categorized under the high-quality ANC index. Thus, the low-quality ANC index refers to young women that are considered to have a low-quality ANC and the high-quality ANC index referred to young women with a higher quality ANC.

A Cronbach's Alpha (reliability) was also computed for the group of variables. If Cronbach's Alpha is 0.6 – 0.7 or greater, then we have sufficient justification to support the creation of a summated scale using existing items (Cronbach, 1951). The Cronbach's Alpha was 0.75 which

implies that about 75 percent of the variability in the group variables used to measure the quality ANC index was considered a reliable score variance.

The second outcome measuring maternal health care utilization by young women in Ghana is the use of a Skilled Birth Attendant (SBA) for delivery of the last birth. The use of SBA operationalizes maternal health-seeking behaviour as the actions taken by women to ensure the most optimum pregnancy outcomes for themselves and their babies drawing on the general definition of health-seeking behaviour (Ward et al., 1997). A binary variable "use of an SBA": coded as 1 – if delivered by an SBA, a doctor, nurse, or midwife and 0 – not delivered by SBA.

The main outcome variable was the pregnancy outcome of young women who were pregnant in the five years preceding the survey. Four things can happen to confirm pregnancy outcomes. Live birth, miscarriage, stillbirth, or abortion. Pregnancy outcomes in relation to the fetal or child life were categorized as alive or not alive. Studies have shown that the likelihood of poor pregnancy outcomes (maternal deaths and stillbirth) is higher among women who had no antenatal care (Owais et al., 2013; Sagna & Sunil, 2012), and delivered at home (Magoma et al., 2010), and those delivered alone or assisted by an unskilled health worker (Mugo et al., 2016). In the data set, they are created from several questions including: "Was the baby born alive or born dead, or did you have a miscarriage or abortion? Did that baby cry, move or breathe when it was born? If born dead or lost before birth, how many months did this pregnancy last?" Babies born after seven months (pregnancy duration seven months or above) that were recorded as having been born dead or who did not scream, move or breathe were marked as stillborn when it was born. This is consistent with the WHO definition of stillbirth for international comparisons: ≥1000g birth weight or ≥28 completed weeks of gestation (Blencowe et al., 2016; Lawn et al., 2011). Pregnancy outcome is

measured as a dichotomous outcome (1 = for live and 0 = if otherwise). It is possible for a woman to experience all situations in her life, but the scope of this study is limited to an experience of any of these outcomes at the given period, five years prior to the data collection .

3.3.2 Independent Variables

3.3.2.1 Individual-Level Variables

Socioeconomic Status (SES): SES means an individual or household's hierarchical rank or social position in their community or society. It includes financial position generally measured by earnings and/or property and social status measured in terms of schooling and/or work (Adler et al., 1994). Although some studies use a composite SES measure, others recommend specifying the individual measures, as they may have different effects on different outcomes (Braveman et al., 2010). This is especially true for maternal health-seeking behaviour where the effect of education, wealth, income, and occupation differs in different contexts. Using measures of the individual components of SES is also more useful for identifying plausible explanatory pathways and mechanisms with which SES has an impact on the results (Braveman et al., 2010). Composite SES measures are rarely used in the maternal health literature, which would make comparisons with the existing literature difficult. Thus, SES would be operationalized as education and wealth in the GMHS.

Women Education Status: Education level achieved by a woman was classified into three categories, namely as no education, primary education level attainment, and secondary and higher education level attainment. Previous studies posited that education attainment even up to primary education level and above is proven to increase maternal health care services and increased

maternal health outcomes (Gage, 2007; Matsuoka et al., 2010). Therefore, the inclusion of this education enlightened the study on how best education can be articulated to improve maternal health outcomes, especially with pregnancy outcomes.

Household Wealth Index: The household wealth index was derived through PCA from household possessions. Households are given scores based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as the source of drinking water, toilet facilities, and flooring materials. To determine the index, each of the items was assigned a factor score, and then individuals were ranked according to the total factor score of the household they live in. This information is then used to come up with a household asset index using the PCA (GSS et al., 2018). The household wealth index is in quintiles and is used to estimate a household's economic wellbeing. These were further categorized into low wealth (Poor and Poorest quintiles), medium wealth (Medium quintile), and high wealth (Rich and Richest quintiles). The household wealth index is used to estimate a household's economic wellbeing.

Other Control Variables

Age in the study was categorized into two dimensions namely 15 - 19 and 20 -24. In a study, the age of the mother was found to be the significant predictor associated with maternal health care utilization (P. K. Singh et al., 2012). Therefore, the use of age in this study to test its relationship with women's utilization of prenatal health care services is of paramount importance.

Marital status: Self-reported marital status of women was categorized as not married and married. The not married combined the, divorced, separated, and the singles and married combined those married and those cohabiting as married.

Parity: Self-reported number of children ever born. Several studies have shown a strong negative relationship between parity and maternal healthcare-seeking behaviour (Ahmad et al., 2019; Larsen et al., 2016). The inclusion of this variable is intended to capture the effects of the number of children ever born on a woman's likelihood of seeking maternal health care.

Religious Affiliation: This defines the religious belief of the respondents in four categories, namely, Christians (*Catholics, Presbyterians, Adventists, Pentecostals, Anglicans, and Baptists*), Muslim, traditionalists, and the respondents with no religion. Previous theories emphatically indicate that ethnicity and religious belief have a bearing on women's choice of uptake and use of maternal health care (Glei et al., 2003; Magadi et al., 2006). Therefore, the need to document the contribution of religious beliefs to maternal care service utilization in the Ghanaian setting is important. Additionally, Dankwah et al., (2019) and Gyimah et al., (2006) pointed out that there is a need for a continuous effort to examine the relationship between religion and maternal health care utilization in Africa due to the influence of religion on the cultural fabric of an African behaviour.

3.3.2.2 Contextual level (neighbourhood level) variables

Contextual determinants operate at different spatial scales such as neighbourhood, district, and higher scales such as region and locality (Hartung & Hillmert, 2019). For the purpose of this study, neighbourhoods are selected as a higher-level unit of analysis. Due to a lack of standardized definition, neighbourhoods are often represented by political boundaries, such as census enumeration areas (census dissemination blocks, postal code areas, or planning divisions in other jurisdictions) (Engstrom et al., 2013). The selection of an appropriate scale to represent

neighbourhoods is often determined by the homogeneity of socio-economic conditions of spatial units at this scale, the perceived sense of neighbourhood by the residents, and the zones of influence of community organizations (Engstrom et al., 2013). It may also be statically determined by the distance at which the greatest spatial clustering of the outcome is studied and the clustering of socio-economic status obtained (Hartung & Hillmert, 2019).

At a higher spatial scale, rural-urban divisions and the division of different districts, municipalities, or regions are "natural" divisions, since public policies may operate differently from district to district and from region to region. These higher-scale units may be appropriate administrative units for the analysis of policy impact on maternal health (Engstrom et al., 2013). Therefore, except for a place of residence and geographical regions, the GMHS does not capture variables that can describe the characteristics of the neighbourhoods. Enumeration Areas (EAs) are used to represent communities and neighbourhoods because they are the most consistent measure of communities across all DHS surveys and many previous studies have defined communities or neighbourhoods similarly (Ononokpono et al., 2013; Yebyo et al., 2015). The EAs or clusters are administrative units that are used as a proxy for the neighbourhoods in this study.

Place of Residence: Relates to living in rural or urban areas as a respondent. Neighbourhoods with a population of 5,000 or more are described as urban areas, while rural areas are localities with a population of less than 5,000. A locality is "a distinct population cluster (also designated as inhabited place, populated centre, settlement) which has a name or locally recognized status" (Ghana Statistical Service, 2012, p. ix). Place of residence is a contextual measure capturing the general quality and accessibility of health services in the area where each respondent lives. It is an

independent variable in all the analyses. Story (2014) pointed out that the inclusion of the neighbourhood factors such as the place of residence of the respondents is significant to understanding the neighbourhood impact on maternal health care service utilization in this case, care service utilization in Ghana.

Region: The place of the women's residence was recognized as an important factor in maternal health-seeking behaviour. The region of residence is an indicator of the level of socio-economic development, hence will increase our understanding of the differences in accessing maternal health care services as well as maternal healthcare-seeking behaviour. In the data, the region of residence was categorized into ten (10) as Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East, and Upper West Regions.

Neighbourhood Barriers to Health Care Access Index: This study used Enumeration Areas (EAs) or clusters to represent communities/neighbourhoods mainly because the GMHS did not collect aggregate-level data at the community/neighbourhood level. A total of 900 EAs (466 in urban areas and 434 in rural areas) were selected for the GMHS 2017 survey. Hence, the aggregation of women's responses to questions at the individual level was used to create the neighbourhood barriers to the health care access index. Hence, this neighbourhood-level variable was measured by using women's experience in four areas that included getting permission to go for treatment, getting money for treatment, distance to a health facility, and having registered with health insurance. These questions ensure that barriers to access cover a wide range of areas such as the ability to go for treatment, affordability, distance to the health facility, and accessibility (insurance). Young women were asked whether the following is a big problem or not when they

want to get medical advice or treatment; (1) getting permission to go to the doctor, (2) getting the money needed for advice or treatment (3) the distance to the health facility and (4) registered with health insurance.

Neighbourhood barriers to the health care access index were generated by aggregating the individual women's characteristics within their clusters. The aggregates were computed using the mean values of the proportions of women in each cluster of a given individual variable. This was further divided into two using the grand mean proportion as the cut-off point and categorized as high proportion and low proportion. This was done after the proportions were grand mean-centred. Neighbourhoods with a high proportion represent high barriers to healthcare access by women and neighbourhoods with a low proportion represent low barriers to healthcare access by women.

3.4 Analytical Techniques

3.4.1 Univariate analysis

A univariate statistical approach is used in the study to describe the background characteristics of the respondents associated with quality of ANC, skilled birth/institutional delivery, and pregnancy outcomes. Percentages were used to present the univariate results. The background characteristics of women included were age, education, wealth status, religious affiliation, quality of care, place of residence, current marital status, the number of living children (parity), and health care providers. This is intended to understand the socio-demographic and economic characteristics of these women as they relate to the three variables of interest (quality ANC, SBAs, and pregnancy outcomes).

3.4.2 Bivariate Analysis

The bivariate analysis used in this study was to determine the empirical relationship between the variables of interest (Quality ANC, SBA, and Pregnancy Outcomes). Thus, the analysis at this stage seeks to explain the relationships that exist between these variables on one hand and the independent variables on the other.

Pearson Chi-square and binary logistic regression were adopted to test the association between the control variables (age, educational level, the number of living children (parity), place of residence, ethnicity, marital status, head of household, household wealth, and the number of ANC visits, trimester ANC provider and type of facility) and the dependent variables.

3.4.3 Multivariate Analysis

The third stage of analysis specifically uses the multilevel binary logistic regression model to explore the relationship between the dependent and independent variables in the succeeding chapters four, five, and six. Thus, the three main outcome variables of interest in this study are quality antenatal care, skilled birth attendance, and pregnancy outcomes.

Typically, because of the inherent hierarchical nature of the Ghana Maternal Health Survey (GMHS), in which data are collected using a multistage random sampling approach, multi-level analysis is more appropriate to use in this study (Rabe-Hesketh & Skrondal, 2012; Worku et al., 2013). However, people in the same clusters are usually similar but different in distinct clusters. The lack of independence causes an underestimate of standard errors giving spurious significant results. Hence, the need for multilevel modelling to take into account the hierarchical structure of

the data, clustering at different levels coupled with simultaneous analysis of neighbourhood and individual-level factors (Gage, 2007a).

This study used a two-level binary multivariate logistic regression model, by examining the effects of the number of individual and neighbourhood variables. In the analysis, the study characterizes individual and household level variables at the individual level (or first level) and characterizes cluster or neighbourhood level as the second level. The study presents for each of the three dependent variables four models as model one Intercept-only model, an empty model that contains no covariates. This model decomposed the total variance into individual and neighbourhood components. In other words, the neighbourhood level variance was estimated to justify the applicability of multilevel regression analysis. The neighbourhood-level variance was statistically significant (p-value < 0.000) for all models; it showed that some of the total variances in all utilization outcomes can be explained by neighbourhood-level factors. Thus, multilevel analysis (MLA) was performed to adequately consider the neighbourhood-level factors affecting utilization outcomes. Model two - has only the individual-level variables included; thus, it measures only the effect of individual characteristics on the dependent variables. Model three contains the neighbourhood-level factors. It thus assessed the effects of neighbourhood factors as they influence the dependent variables. Model four has both the individual-level variables and the neighbourhood-level factors concurrently to determine their combined fixed and random effects on the use of maternal health care and pregnancy outcomes. This model was built sequentially by adding one neighbourhood-level variable at a time to avoid the potentiality of collinearity with other variables and to see if the addition of neighbourhood-level variables improves the model.

The null model (Model 1); (Equation 3.1) provided an estimate of the between-cluster variance, which was used to calculate the intra-cluster correlation coefficient (ICC).

Model 1: $\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \gamma_{oj} + \mu_{oj} + e_{ij}$ .....(Equation 3.1)

Where: π_{ij}= *estimated probability of outcome variable = 1 for individual 'i' in-group 'j'*

γ_{oj} = *group-specific intercept*

μ_{oj} = *neighbourhood-level random effects*

e_{ij} = *individual-level random effects*

Model 2: Individual-level factors associated with the dependent variables (Equation 3.2)

$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \gamma_{oj} + \beta X_{ij} + \mu_{oj} + e_{ij}$ .....(Equation 3.2)

Where: βX_{ij} = *coefficients of the individual-level exposure variables*

Model 3: neighbourhood-level factors associated with the dependent variables (Equation 3.3)

$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \gamma_{oj} + \delta Z_j + \mu_{oj} + e_{ij}$ .....(Equation 3.3)

Where: δZj = *coefficients of the neighbourhood-level exposure variables*

Model 4: Controlling for individual-level factors, neighbourhood-level factors are associated with the dependent variables (equation 3.4)

$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \gamma_{oj} + \beta X_{ij} + \delta Z_j + \mu_{oj} + e_{ij}$.....(Equation 3.4)

The ICC is defined as the ratio of the between-cluster variance to the total variance (both between and within clusters), and, therefore, has a value between 0 and 1. It measures the relatedness of elements within the clusters, and an ICC of '0' indicates that individuals within clusters are no more similar to each other than individuals from different clusters (there is no between-cluster variability), while an ICC of 1 indicates that individuals within the same cluster all have identical outcomes (Killip et al., 2004).

Mathematically, it is the ratio between cluster variability and total cluster variability (i.e., between-cluster and within-cluster variability). Thus, it is represented by

$$\rho = \frac{\sigma\mu^2}{(\sigma\mu^2 + \frac{\pi^2}{3})}$$

Where $\sigma\mu^2$ is the variance between clusters and $\frac{\pi^2}{3}$ is the variance within clusters. It is assumed that within-cluster variability (that is, variation among the women within the cluster) is constant, estimated at $\frac{\pi^2}{3}$ or 3.29 (Albright & Marinova, 2010; Worku et al., 2013; Rabe-Hesketh & Skrondal, 2012). The intra-class correlations were calculated for all four models.

All analyses were conducted using Stata version 13 (StataCorp) and the significance of the random effects was evaluated using the likelihood ratio (LR) statistics (D. N. Ononokpono & Odimegwu, 2014b).

3.5 Limitations of the Study

This study has some noteworthy limitations, and all study results must be interpreted with consideration of these limitations. One of the limitations of this study is the measurement of ANC quality that only covers the service delivery. It does not capture women's experience with the health system (the nature of the interactions with healthcare providers and how they are treated) although it gives the impression that women are being given the essential ANC services. To the best of the knowledge of this study, there are only a few studies in Ghana that have attempted to examine the factors that influence the patient's experience dimension of quality of ANC using multilevel analysis (Afulani, 2015; Atinga et al., 2014). However, it is important to examine patient experiences as qualitative studies show that negative behaviour by health workers constitutes a significant obstacle to the utilization of maternal health care services. These researches have additionally indicated differentials in the satisfaction of patient experience of quality care through education and location of residence, which could also be higher than those associated with services received (Moyer et al., 2014a; Ozge et al., 2012).

Another key limitation of the study is associated with the definition of relevant 'groups', which is a great challenge in multilevel analysis. The study used primary sampling units (PSU) as a proxy for the neighbourhood or community and this may have biased the results due to selection bias. Neighbourhoods are defined in relation to geographical criteria, administrative boundaries, or respondents' perceptions (Gage, 2007b). As Boco (2010) noted, using the GMHS primary sampling unit as the neighbourhood may bias results towards a functioning population as a result of endogeneity and selection effects. Selection bias recognizes the fact that individuals or families have some degree of choice regarding the neighbourhoods in which they live (Ononokpono and

Odimegwu, 2014). In consideration of this fact, if important unmeasured individual characteristics lead individuals (women) to choose certain kinds of neighbourhoods that influence their healthcare-seeking behaviour either positively or negatively, then the observed effects of neighbourhood-level factors in this study may have been biased and the direction of this selection bias is unclear. In other words, it is not certain whether this bias would result in an overestimation or underestimation of the true effects of the neighbourhood factors in this study.

It has frequently been argued that the selection bias results in an overestimation of neighbourhood effects since advantaged populations are most likely to live in advantaged neighbourhoods; while disadvantaged groups are more likely to live in disadvantaged neighbourhoods as they cannot afford better neighbourhoods (Ononokpono and Odimegwu, 2014). Thus, the coincidence of having high levels of healthcare-seeking behaviour among women in advantaged neighbourhoods may result from living in such neighbourhoods. However, the emphasis here is that the important individual factors controlled for in this study may be linked to some of the unobserved factors, and thus would help reduce the potential biases that would otherwise have resulted from not controlling for some possible confounders.

In addition, the possibility of transactional effects on the results of this study should also be taken into consideration. The transactional model states that it is not only individuals that can create and shape their neighbourhoods, but also that characteristics of individuals or families can be shaped by the neighbourhoods in which they live (Brooks-Gunn et al., 1997). Furthermore, it has been argued that if aspects of the social environment influence health including health behaviour, by operating as upstream determinants of individual characteristics, then controlling for many

downstream individual characteristics (as shown in the study) may over adjust the true effects of the neighbourhood contexts (Merlo et al., 2003). The neighbourhood in which an individual resides may affect her characteristics in many ways. For instance, neighbourhoods with a proportion of educated women can influence individuals' socio-economic status. The neighbourhood effects in the study were estimated while controlling for maternal age, educational attainment, ethnic origin, religion, occupation, and household wealth index among others. Therefore, if neighbourhood factors do affect these individual-level variables, which in turn influence maternal healthcare-seeking behaviour, the control for these variables may have over-adjusted the true effects of the neighbourhood variables.

Another limitation of the study relates to the neighbourhood contextual variables used in the analysis. Except for region of residence and place of residence, all the neighbourhood variables were constructed by aggregating the individual-level characteristics at the neighbourhood level. The problem with this approach is that it could result in multicollinearity since the same variables were aggregated at the neighbourhood level (Boco, 2010; Rajaratnam et al., 2006). However, the test for collinearity showed that most of the variables were not highly correlated. In addition, it is associated with the problem of making inferences at a higher level (neighbourhood level) based on information from data collected at a lower level (individual level) (Boco, 2010).

CHAPTER FOUR

QUALITY OF ANTENATAL CARE AMONG YOUNG WOMEN IN GHANA

4.1 Introduction

Ghana is a developing country and like other developing countries, Ghana is making significant strides in maternal health care utilization rate. A critical factor that affects the health care utilization of pregnant mothers is the quality of services provided. The degree to which patients are well attended to will reinforce their desire to access such facilities. According to the Ministry of Health, Ghana (2006), the quality of services delivered impacts the individual's health-seeking behaviour. Thus, the quality of health care provided by broader health systems is a major determining factor to influence the healthcare-seeking behaviours of Ghanaians, especially young women.

This chapter aims to evaluate the factors that influence the quality of antenatal care among young women in Ghana and reveal how individual level and neighbourhood level characteristics affect the quality of antenatal care among young women by using the multilevel logistic regression model. In addition, the findings are discussed in relation to Donabedian's (2003) process and outcome framework, Thaddeus and Maine's (1994) three delays, and Andersen's (1995) Behavioural Model of Health Services Utilization.

4.2 Individual-Level Characteristics of Respondents

Table 4.1 provides individual-level characteristics of young women in the study. The results show that, of the 2,669 young women who have ever been pregnant in the five years preceding the

survey, a higher proportion (80%) were within the age group of 20 to 24 years compared to age 15 to 19 years. The results also show clearly that an overwhelming majority of young women in Ghana in the survey are currently married whilst about 26 percent were not married.

Table 4.1 Background Characteristics of Respondents

Characteristics	Percentage	Number
Individual/Household factors		
Age		
15 - 19	19.9	531
20 - 24	80.1	2138
Marital status		
Not Married	25.9	691
Currently Married	74.1	1978
Education		
None	20.1	535
Primary	20.3	543
JHS	43.7	1166
SHS/Higher	15.9	425
Wealth index		
Low	62.6	1671
Middle	19.3	515
High	18.1	483
Ethnicity		
Akan	33.5	894
Ga/Dangme	7.3	197
Ewe	8.9	238
Mole-Dagbani	32.7	874
Grusi/Gurma/Mande	17.6	466
Religious affiliation		
Christian	70.9	1892
Others	29.1	777
No. of ANC visits		
< 4 visits	10.9	29
4 + visits	89.1	2378
Trimester of first ANC visit		
First	59.5	1587
Second	35.9	957
Third	4.7	125
ANC quality of care score		
19 or less	30.8	823
20 or more	69.2	1846

Source: Computed from GMHS data, 2017

On educational attainment, 20.3 percent of the young women had primary education whilst about 44 percent had completed Junior High School (JHS). In addition, around 20 percent of the young women had no formal education. Furthermore, about 16 percent of the young women had Higher education or Senior High School (SHS). Concerning the household wealth index, the majority of young women (62.6%) were from households with low wealth and those with medium and high wealth constituted 19.3 percent and 18.1 percent respectively.

Also, a higher proportion of young women in Ghana belong to the Akan ethnic group relative to the other ethnic groups. This can also be explained within the context of the general distribution of Ghana's population by ethnicity where the Akan constitute about 47 percent of Ghana's population (GSS et al., 2015). Further, the least proportions of young women in the survey belong to the Ga/Dangme ethnic group and the Ewe ethnic group.

It has been noted concerning the religious association, that most women were Christians and accounted for around 71 percent. Likewise, others (Islamic, traditionalist, and no religion) account for around 29 percent. The results also show that more than four-fifths (89%) of the respondents had four or more ANC visits during pregnancy. About six out of ten (59.5%) of the young women who received ANC started in the first trimester while about four percent started in the third trimester. The average ANC quality score is 19.0 with a range of zero to 24 using the additive index as described in chapter three. More than three-fifths (68.0%) received 20 or more services (high quality) and about 32 percent received 19 or fewer services (low quality).

4.3 Characteristics of Neighbourhood-Level Indicators

The clusters are the units of analysis at the neighbourhood level. The total number of clusters identified for this study was 900 clusters within the rural and urban centers of Ghana. A significant proportion of women were selected from each of these clusters across the ten (10) administrative regions of Ghana to ensure a fair representation of women in the study. The majority of clusters were selected from the urban areas (51.8%) and 48.2 percent from the rural areas. The percentage distribution of the study sample by neighbourhood characteristics is presented in Table 4.2. A consideration of the place of residence indicated that a predominantly high proportion of young women (62.0%) were living in rural areas while 38 percent resided in urban areas. With regards to the regional distribution of young women in Ghana, the majority of them (63.4%) were residents in the Northern zone of the country; Northern Region (18.0%), Upper East Region (14.0%), Ashanti Region (10.6%), Brong-Ahafo Region (10.0%), and Upper West Region (9.9%). Whilst the rest 36.6 percent were distributed among the regions in the Southern Sector. Western (9.7%) Eastern (8.7%), Central (6.8%), Greater Accra (6.0%) and Volta (5.4%). The results further revealed that more than half of young women (69.0%) resided in neighbourhoods that were classified as having a high barrier to healthcare access whereas the rest (31.0%) lived in neighbourhoods classified as having low barriers to healthcare access.

Table 4.2 Percentage Distribution of Young Women by Neighbourhood-Level Characteristics in Ghana

Characteristic	Percentage	Number
Place of Residence		
Urban	38.0	1014
Rural	62.0	1655
Region		
Volta	5.4	145
G. Accra	6.0	161
Central	6.8	181
Eastern	8.7	231
Western	9.7	259
Upper West	9.9	264
Brong-Ahafo	10.0	268
Ashanti	10.6	282
Upper East	14.0	374
Northern	18.9	504
Neighbourhood Barriers to health care access		
Low	30.6	817
High	69.4	1852

Source: Computed from GMHS data, 2017

4.4 Variation in Quality of ANC and Individual-Level and Neighbourhood-Level Characteristics

The variation in ANC quality due to individual-level and neighbourhood-level features of young women in Ghana is presented in Table 4.3. All differences shown are statistically significant at $p < 0.05$. In every dimension of the Quality of ANC studied, the quality of ANC increased with increasing women's age. Young women between 15 and 19 years of age had about 65 percent higher quality of ANC and those at the age of 20 – 24 had 70.3 percent higher quality of ANC. In addition, at educational levels, the quality of ANC increased with increasing mother's education.

That is, at the highest educational level, the quality of ANC was about 77 percent compared to their peers with primary education (63%) or no education (62%). The household wealth difference between the low and the high was also statistically significant with women from high wealth households being more likely than women from low wealth households to receive a high quality of ANC (77.8% and 66.3% respectively).

Table 4.3 Association between individual-level and neighbourhood-level characteristics and quality of ANC among young women in Ghana.

Individual-Level Characteristics	Quality of ANC		Chi-Square	df
	High	Number		
Age in years				
15 - 19	64.5	343	12.2*	1
20 - 24	70.3	1503		
Marital status				
Married	69.8	1379	3.8*	1
Not Married	65.7	467		
Highest Education				
None	62.4	334	40.3*	3
Primary	62.8	341		
JHS	72.2	842		
SHS/Higher	77.4	329		
Household wealth				
Low	66.3	1105	24.8*	2
Middle	70.9	366		
High	77.8	375		
Ethnicity				
Akan	69.2	605	11.3*	4
Ga/Dangme/Guan	75.6	149		
Ewe	71.9	171		
Mole-Dagbani	69.8	624		
Grusi/Gurma/Mande	63.7	297		
Religious affiliation				
Christian	68.7	1300	0.93	1
Others	66.8	519		

Table 4.3 continued

Neighbourhood-Level Characteristics	Quality of ANC		Chi-Square	df
	High	Number		
Place of Residence				
Rural	68.3	1130	4.6*	1
Urban	70.6	716		
Region				
G. Accra	75.8	122	28.8*	9
Upper East	72.7	272		
Eastern	72.3	168		
Western	71.4	185		
Upper West	70.5	186		
Ashanti	68.4	193		
Northern	65.3	329		
Central	65.2	118		
Volta	60.0	87		
Brong-Ahafo	59.3	159		
Neighbourhood Barriers to health care access				
Low	63.0	515	15.2*	1
High	70.4	1,304		

Source: Computed from GMHS data, 2017
**p <0.05, **p < 0.001 df- degrees of freedom N = 2669*

With respect to the neighbourhood-level characteristics, 68 percent of young women from the rural area received high-quality ANC whilst 70 percent of the women from the urban area received high-quality ANC. Rural women were less likely to have had at least four antenatal care visits and received skilled antenatal care than urban women. Regional variations in the experience of high-quality ANC were pronounced, with the proportion ranging from about 76 percent to 59 percent among women in the Greater Accra to Brong-Ahafo. The proportion of high-quality ANC among young women from neighbourhoods with high neighbourhood barriers to health care access was

highest compared to young women from neighbourhoods with low neighbourhoods with high neighbourhood barriers to health care access.

4.4 Factors influencing Quality of Antenatal Care among Young Women in Ghana

All the variables showing significant association with the quality of ANC by the chi-squared test were also tested using multilevel bivariate modelling, and, at a 95 percent confidence interval, all statistically significant variables were considered as potential variables and included in the main model.

The statistically significant variables such as age, household wealth, education and marital status as indicated in Table 4.4 show an increased likelihood of receiving high-quality ANC. For instance, young women aged 20 – 24 years were 1.31 times as likely to receive a higher quality of ANC compared to those aged 15 - 19. Quality of care also increases with education and household wealth. Young women who have completed junior high school were about 1.6 times (OR=1.56; $p < 0.05$ CI: 1.26, 1.94) as likely to have received quality ANC as young women with no education, and women who have completed senior high/higher education level were 2 times (OR=2.06; $p < 0.05$ CI: 1.55, 2.75) as likely to have received quality of care as women with no education. Similarly, the study showed that women who are from middle and high-income households were found to experience an increased likelihood of quality of care by 1.24 and 2.03 times respectively both at $p < 0.05$. At the neighbourhood level, the bivariate multilevel modelling showed that young women who live in urban areas were 1.12 times (OR=1.12, $p < 0.05$ CI 1.02 - 1.34) as likely to have received quality of care as their rural counterparts. Also, young women who gave birth to their last child during the five years preceding the survey residing in neighbourhoods with low degree of barriers to health care access were about 1.4 times more likely to have received quality of care compared to women who reside in neighbourhoods with high degree barriers to health care

access. It should be noted that the neighbourhood barriers to health care access variable was measured using women's reporting of the problems they experience accessing health care. Also, with the regional effect, young women living in the Central, Volta, Ashanti, Brong Ahafo, Northern, and Upper West regions have lower odds of receiving a higher quality of ANC compared to young women living in the Greater Accra Region; but no statistical difference between Greater Accra Region and the other regions was observed (Western, Eastern, and Upper East regions).

Table 4.4 Association between Individual/Household and Neighbourhood Variables and Quality ANC among Young Women in Ghana.

Variables		OR	95% CI
Individual/Household Variables			
Age			
15 – 19	(RC)	1.00	
20 - 24		1.42**	[1.07 - 1.60]
Highest Education			
None	(RC)	1.00	
Primary		1.02	[0.73 - 1.30]
JHS		1.56**	[1.26 - 1.94]
SHS/Higher		2.06**	[1.55 - 2.75]
Household wealth			
Low(RC)		1.00	
Middle		1.24**	[1.01 - 1.55]
High		2.03**	[1.42 - 2.28]
Marital Status			
Married	(RC)	1.00	
Not Married		1.20**	[1.00 – 1.44]
Ethnicity			
Akan	(RC)	1.00	
Ga/Dangme		1.38	[0.97 - 1.97]
Ewe		1.13	[0.83 - 1.56]
Mole-Dagbani		1.03	[0.84 - 1.25]
Grussi/Gurma/Mande		0.78**	[0.62 - 0.99]
Religious affiliation			
Christian	(RC)	1.00	
Moslem		1.05	[0.86 - 1.28]
Traditionalist		0.46**	[0.28 - 0.77]
No religion		0.52**	[0.34 - 0.81]
Neighbourhood factors			
Place of Residence			
Rural	(RC)	1.00	
Urban		1.20**	[1.02 - 1.34]
Neighbourhood Barriers to health care access			
High	(RC)	1.00	
Low		1.40**	[1.17 – 1.66]

Table 4.4 Continued

Ethnicity

Variables	OR	95% CI
Region		
G. Accra (RC)	1.00	
Central	0.51***	[0.32 – 0.84]
Volta	0.46***	[0.28 – 0.77]
Ashanti	0.58**	[0.37 – 0.91]
Brong Ahafo	0.39***	[0.25 – 0.61]
Northern	0.52***	[0.34 – 0.79]
Upper West	0.56**	[0.36 – 0.89]
Western	0.74	[0.46 – 1.18]
Eastern	1.04	[0.64 – 1.72]
Upper East	0.70	[0.45 – 1.08]

(RC)=Reference Category; C. I=Confidence Interval
Source: computed by author using the GMHS 2017

4.4.2 Multivariate Multilevel Modelling

The first stage in the multilevel analysis was to determine whether the data supported the decision to test random effects at the neighbourhood levels. The results of the random intercept of the multilevel logistic regression analysis for the quality of ANC among young women in Ghana is shown in Table 4.5. The first model (model 1) which is an empty model, investigated the total variance in quality of ANC that can be attributed to the neighbourhoods in which young mothers were residing. In other words, the neighbourhood-level random variance was estimated to justify the applicability of multivariate multilevel analysis.

Model 1 (empty model or null model) in Table 4.5 shows that there was statistically significant variability in the odds of receiving quality ANC across neighbourhoods ($\boldsymbol{\tau}$=1.36, p=0.000). Hence, the intraclass correlation (ICC) is 0.292, which explained the variability in the quality of ANC attributed to neighbourhood-level variables. This implies that 29.2 percent of the total variation in the quality of ANC among young women in Ghana is attributed to the neighbourhood in which these young mothers reside. This also suggests that the correlation between mothers living in the same neighbourhood regarding the likelihood of experiencing the quality of ANC was 0.292. After the quality of ANC variability in model 1 has been decomposed, individual-level covariates were introduced into the empty model forming Model 2. It has been found that in Model 2, the variance in the neighbourhood level was 20.7 percent. That showed, however, that the composition of the individual components in the neighbourhoods described much of the variability at the neighbourhood level seen in the null model. Nevertheless, Model 2 has been expanded to form Model 3 by the addition of neighbourhood-level covariates. Controlling for both individual and neighbourhood-level factors, the neighbourhood-level variance was still statistically significant. It is significant to note that rather than the normal single-level model, a random intercept model was developed not only because of the hierarchical character of the data but also to avoid biased associations.

Table 4.5 Multilevel Binary Logistic Regression of Quality of Antenatal Care (ANC) on Place of Residence, Education, and Relevant Confounders, N=2,669

	Quality of ANC: OR [95% CI]			
Independent variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR	**OR (C.I)**	**OR C. I**	**OR C.I**
Randoms effects (Neighbourhood Level)				
variance (SE)	1.36**(0.03)	0.86** (0.02)	0.58**(0.02)	0.53**(0.27)
ICC (%)	29.2	20.7	15.0	13.9
Log-Likelihood	-1684.8503	-1522.7891	-1611.8624	-1514.1361
Age				
15 – 19 (ref)		1.00		
20 – 24		1.20 [0.96 – 1.48]		1.20* [0.75 – 1.32]
Education				
None (ref)		1.00		
Primary		1.02 [0.78 - 1.33]		1.00 [0.75 – 1.32]
JHS		1.45***[1.13 – 1.85]		1.47***[1.13 – 1.91]
SHS/Higher		1.51** [1.09 – 2.08]		1.50** [1.09 – 2.09]
Household wealth				
Low (ref)		1.00		1.00
Middle		1.06 [0.84 – 1.34]		1.16 [0.90 – 1.51]
High		1.41** [1.08 – 1.83]		1.47** [1.09 – 2.00]
Religion				
Christian (RC)		1.00		1.00
Moslem		1.08 [0.87 – 1.33]		1.16 [0.92 – 1.47]
Traditionalist		1.00 [0.39 – 1.23]		0.73 [0.41 – 1.31]
No religion		0.63 [0.40 – 1.01]		0.59** [0.36 – 0.94]
Number of ANC visits				
Less than 4 (ref)		1.00		1.00
Four or more		2.50***[1.89 – 3.30]		2.66***[2.01 – 3.54]
Trimester of first ANC				
First trimester (ref)		1.00		1.00
Second trimester		0.97 [0.81 – 1.72]		0.99 [0.82 – 1.20]
Neighbourhood factors				
Neighbourhood Barriers to health care access				
High (RC)			1.00	1.00
Low			1.40** [1.16 – 1.67]	1.24** [1.02 – 1.49]
Place of Residence				
Rural (ref)			1.00	1.00
Urban			0.76** [0.61 – 0.94]	0.99 [0.82 – 1.19]

Table 4.5 Continued

	Quality of ANC: OR [95% CI]			
Independent variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR	**OR (C.I)**	**OR C. I**	**OR C.I**
Region				
G. Accra (RC)			1.00	1.00
Central			0.53** [0.32 – 0.87]	0.48***[0.28 – 0.83]
Volta			0.49***[0.29 – 0.83]	0.45***[0.25 – 0.79]
Ashanti			0.98** [0.37 – 0.94]	0.52** [0.31 – 0.86]
Brong Ahafo			0.38***[0.24 – 0.60]	0.34***[0.21 – 0.57]
Northern			0.57** [0.37 – 0.89]	0.55** [0.33 – 0.91]
Upper East			0.64* [0.40 – 1.01]	0.57** [0.34 – 0.96]
Upper West			0.55** [0.34 – 0.89]	0.47***[0.28 – 0.80]
Western			0.77 [0.47 – 1.24]	0.72 [0.42 – 1.21]
Eastern			1.12 [0.67 – 1.87]	1.15 [0.66 – 2.01]

Source: computed by author using the GMHS 2017
Note: *** p < 0.001; **p < 0.05; * p < 0.01
(RC)=Reference Category; C. I=Confidence Interval
Model 1-null model
Model 2-individual level only model
Model 3-neighbourhood level only model
Model 4-individual level and neighbourhood level model

Table 4.5 also shows the fixed effects of both the individual and neighbourhood factors. Model 2 shows the fixed effect of the relationship between the quality of ANC and individual-level factors without the neighbourhood-level factors. Model 3 also shows only the fixed effects of the association of quality ANC and neighbourhood covariates while Model 4 illustrates the fixed effect of both the individual and neighbourhood level factors. Model 2 showed that the most significant individual-level predictors of quality ANC services were women's level of education, household wealth, number of ANC visits, and trimester of first ANC.

At every educational level, quality of care increased by mother's education as reflected in the statistically significant effect (OR = 1.45; $p < 0.001$); (OR = 1.51; $p < 0.05$) respectively compared with women with no education. Also, the quality of care increased with the mother's household wealth. Women from higher wealth households were 1.41 times as likely to receive the quality of care as women from low household wealth.

At the neighbourhood level variables (Model 3), young women who reside in neighbourhoods with low degree of barriers to health care access were 1.24 times as likely to receive the quality of care as women residing in neighbourhoods with high degree of barriers to health care access. Surprisingly, at the neighbourhood level, place of residence was significantly associated with quality of ANC among young women with reduced odds ratios. Thus, women from urban areas are 24 percent less likely to receive higher quality ANC compared to women from rural areas. Also, the region was significantly associated with the quality of ANC though with lower odds.

When both the individual and neighbourhood level factors were controlled for in Model 4, the individual factors that were significantly associated with the quality of ANC were age, education, household, and wealth. Women between the age of 20 – and 24 years were 1.20 times as likely to receive a high quality of ANC as their colleagues who were 15 – 19 years. The likelihood of receiving a high quality of ANC increased with increasing education. A woman with primary and secondary/higher education levels had 1.47, and 1.50 times higher odds of receiving a high-quality ANC respectively than a woman with no education. Women from the richest households were 1.47 times as likely to receive a high quality of ANC as women from the poorest households (OR 1.47; 95% CI 1.09, 2.09) when adjusted for other variables.

At the neighbourhood level, place of residence is not significantly associated with quality ANC controlling for other factors. Also, with the regional effect, the study found that the region of residence was associated with a reduced likelihood of receiving quality ANC among young women. For instance, regions such as Central, Volta, Ashanti, Brong Ahafo, Northern, Upper East, and Upper West regions were associated with a reduced yet significant likelihood of women receiving a high quality of ANC compared to women from Greater Accra, controlling for other factors. However, neighbourhood barriers to health care access were significantly associated with quality ANC controlling for other factors. Living in neighbourhoods with low degree of barriers to health care access was positively and significantly associated with high odds of quality ANC compared to women living in neighbourhoods with high degree of barriers to health care access (Odds ratio, 1.24). This implies that neighbourhoods that had a low proportion of women reporting at least one serious problem accessing health care were more likely to have young women experiencing a quality of ANC during their last pregnancy.

4.5 Discussion

The goal of this chapter is to examine the factors that affect the quality of antenatal care among young women in Ghana. The outcomes of this research demonstrated the importance of the quality of ANC young women receives beyond the individual-level attributes. The study revealed how the neighbourhoods where young women reside affects the quality of ANC received combined with the individual level features. There were statistically significant associations between the quality of ANC and individual and neighbourhood-level characteristics.

This hypothesis states that 'SES and urban settings are significantly associated with quality ANC'. This assumes that education, household wealth, and living in the urban area enhance female autonomy and create a more egalitarian society where women can negotiate better quality maternal health care services (Gabrysch & Campbell, 2009; Kyei et al., 2012). Results from the bivariate analysis (Tables 4.5) showed that SES and living in urban areas were significantly associated with quality ANC among young women in Ghana. Women with high education, high household wealth, and residing in urban areas were more likely to receive quality ANC. However, results from the multilevel analysis (Tables 4.6) indicated that SES was significantly associated with quality ANC but living in an urban areas was not significantly associated with quality ANC. With respect to residing in urban areas, the result is not conclusive and therefore does not confirm the hypothesis. On the other hand, results indicated that SES was significantly associated with quality ANC. This result, however, is consistent with the proposed hypothesis.

Most young women in Ghana go for antenatal care visits at least once throughout pregnancy. These findings compare favourably with other research (Abor et al., 2011; Nketiah-Amponsah et al., 2013). However, several of these women are not able to tell if they have received the full elements of ANC. The results of the study based on the bivariate analysis showed that the individual-level factors that are essentially related to the quality of antenatal care among young women in Ghana are education, household wealth, ethnicity and religion whiles the neighbourhood-level factors are the place of residence, neighbourhood barriers to health care access and region. On the other hand, the variables essentially related to the quality of antenatal care, controlling for other factors, comprise education and household wealth at the individual level and neighbourhood barriers to health care access and region at the neighbourhood level.

Concerning quality ANC and education, there is a statistically significant relationship between young women's education and quality ANC with the educational differences in impact starting to emerge after Junior high school. In a previous study, it was found that the status of women who have been educated had an enormous effect on improving the use of care services (Ahmed et al., 2010). This confirms the fact that educated women have knowledge of care and have the ability to assess their health and thus make informed choices as to where and when to visit maternal health services compared to their uneducated partners (Ensor et al., 2014). It should be emphasized that an efficient health care facility, which can deliver the necessary maternal care to women, reduces the risk of dying from pregnancy-related causes. The current study found a strong influence of maternal education both on accessing ANC and the quality of ANC received. Multilevel modelling analysis also shows that women with a higher level of education were more likely to access ANC and receive higher quality ANC. This finding is consistent with previous studies (Afulani, 2015; Nketiah-Amponsah et al., 2013; Purbaningrum et al., 2019). This could be because women with a higher educational background may have gained a higher level of knowledge about maternal and child health and the benefits of ANC, resulting in higher levels of ANC use (Titaley et al., 2010) and are also more aware of the benefits of the recommended ANC services and adverse effects of complications related to pregnancy (Acharya et al., 2010). This may also be explained by the fact that educational attainment can be a source of economic resources which empower women to take charge of their health and facilitate easy access to quality maternal care. Education and literacy have dramatically improved over the years, according to the latest study (GSS et al., 2015). Women have increased their school participation from 35 percent in 1993 to 81 percent in 2014 (GSS et al., 2015). This may be due to the impact of the Free Compulsory Universal Basic Education (FCUBE) programme, which was introduced in 1996. However, Ghana has a free

compulsory basic education system, the suggestion is therefore that the government can come closer to achieving its goals in terms of reducing adolescent pregnancy, and maternal and infant death rates. This could be done by further work to improve young women's education and meet specific needs (supporting greater access to comprehensive reproductive health services, providing a comprehensive, evidence-based human development and sexuality curriculum at all grades for all students) of the target populations.

The study found that young women from middle and rich households have a significantly increased probability of receiving high-quality care from health facilities. This is consistent with a study in 32 lower-income countries including Ghana, that found that women from the rich households were about 4 times higher to receive quality and utilize ANC than the poorest women in that study (Guliani et al., 2014). Other studies have postulated that a better standard of living among households has less economic burden which in the long term, improves the quality of care that they sought (Gupta et al., 2014; Joshi et al., 2014).

The positive relationship between socioeconomic status (education and household wealth) and ANC quality was consistent with the results of other ANC quality studies despite some methodological differences (Joshi et al., 2014; Kanyangarara et al., 2017; Muchie, 2017). Probably, the positive association between quality of care and socioeconomic status is explained by the fact that in the communities where the standard of care is usually higher, women with a higher socioeconomic standard can access health care facilities that provide a better quality of care; understand as to what kind of care to probably seek; demand for quality care and insist on it and are much more probable to have had a good relationship with health care workers which

enable some of them to obtain services of high quality. Perhaps, the relationship between women with high socioeconomic status and healthcare professionals also enables them to reinforce their need for quality healthcare (Gabrysch & Campbell, 2009; Hutchinson et al., 2011). Therefore, based on the present study, it is worthy to note that young women from households with high incomes have an increased likelihood of receiving quality health care services. Similarly, they have greater exposure to accessing relevant health information on maternal services, thus enabling them to seek proper health care whenever necessary relative to those from poor households.

The similarities in the findings could be due to the predisposing factors of Anderson's (1995) Model which guided the study. Andersen's Model suggested that utilization of health services is based on the predisposing factors (personal characteristics) and enabling factors of the individual (Andersen, 1995). The predisposing factors such as age, marital status, education, and religion have a greater influence on the decision of pregnant women to go for ANC. The enabling factors such as household wealth and place of residence can also determine the use of ANC by pregnant women. This suggests that the predisposing and enabling factors could enhance or deter pregnant women from using ANC.

Moreover, there is differential use of ANC services as a result of the differences in the quality of ANC based on socioeconomic status. That is, we can tell which factors predominate, examining the associations carefully and how they differ when other factors are present. When other factors were accounted for, rural/urban and quality of care became statistically non-significant. That is, it has reduced the support for the assumption that high socioeconomic status women receive better care due to their living conditions (Afulani et al., 2015). This does not mean that the standard of

service in one's place of residence is irrelevant. It means that, if the socioeconomic status of a woman is high and she cannot receive better care in her immediate community, she can travel outside her community to seek quality care services (Thaddeus & Maine, 1994; Tunçalp et al., 2015). We could also infer from the results that quality ANC services for women from high SES may also be more financially accessible. For instance, during ANC visits, women may be required to pay for laboratory tests and poorer young women in the same facility may not be able to access this service because of the cost. This was the situation in Ghana until the introduction of a free maternal health care policy in 2008. Because the implementation of the policy was characterized by misunderstanding as a result of misinformation, pregnant women are still burdened with some financial costs for ANC services (Anafi et al., 2018; Dalinjong et al., 2018).

Not all, with regards to multivariate analysis, the study found that young women receiving the quality of ANC service, consistently and significantly increased at an individual level, as they become of age. For instance, the study found that women aged 20 - 24 were more likely to receive higher quality prenatal care services compared to the younger women aged 15–19 years. This concurs with the results of Gyimah et al. (2006) who found that in Ghana as the women's age increase, their usage level of prenatal care services correspondingly and significantly increased, and similar studies indicated that the age of the expectant mother has a significant impact on the use and quality of ANC services. The older the mother becomes, the better her chances of receiving a higher quality of ANC and continuous use of antenatal care (Akowuah et al., 2018; Doku et al., 2012).

Remarkably, the focus of this study went beyond the individual and household factors and examined the net effects of community-level factors on quality ANC in Ghana where there is a

paucity of literature. Interestingly, the findings at the community level showed some rural-urban disparities in the use of quality health care services. Several studies report that women residing in urban areas are more likely to receive quality ANC and attend four or more ANC visits as compared to rural dwellers (Asamoah, & Agardh, 2017; Haruna-Ogun, 2018; Muchie, 2017). This is confirmed by the results of this study in the bivariate analysis. This is because urban areas typically have better use of maternal health services, due to the presence of health facilities and quality benefits compared to rural areas. Previous studies have explained this by maintaining that women in urban areas often have higher socioeconomic statuses which can affect their use of maternal health services. Other studies have also linked urban residents with a higher quality of maternal health care services in Ghana compared to their rural counterparts. For example, women from urban areas do not need to travel a long distance to access comprehensive care and at the same time have private health facilities at their disposal to access maternal health care services for a fee from equally well-trained professionals (Graham et al., 2013; Moyer & Mustafa, 2013; Yebyo et al., 2015).

The low quality of maternal health care services provided to rural people in Ghana and other developing nations is a consequence of less developed health infrastructure and inadequately trained health professionals to provide the needed quality of care. Some experts have stated that women in rural Ghana are more likely to be treated poorly, even when they seek care in urban facilities compared to women in urban areas. Compared to those from urban areas, women residing in rural areas lack the financial resources to pay for transportation costs to access quality care at critical moments beyond their catchment areas even when the costs of services are covered by NHIS (Afulani, 2015; Friberg et al., 2010; Hanson et al., 2017; Moyer et al., 2014)

However, in the multilevel modelling analysis, controlling for other factors, the association between quality of care and place of residence was not statistically significant. The non-significance of place of residence on quality of ANC, controlling for other factors among young women in Ghana was surprising. This could be the result of policies rolled out by the Government of Ghana like the policies of exempting pregnant women from delivery fees in all public and religious health institutions since September 2003, followed by the implementation of a free maternal health care policy in July 2008, as well as the free maternal health care policy under the National Health Insurance Service (NHIS) (Anafi et al., 2018; GHS Annual Report, 2013; Owoo et al., 2013). Consequently rural and urban resident women have almost equal opportunities to receive equal services, explaining the observed statistical non-significance in place of residence controlling for other factors. Joshi et al. (2014), using a similar ANC quality measure found living in an urban area to be associated with better quality of care net of other factors in Nepal. Of important note, however, is that this study controlled for the frequency and timing of ANC. Thus, it is difficult to tell if the rural/urban difference they found is due to the differential ANC utilization in rural and urban areas. However, it is probable to have a persistent rural and urban distinction in the quality of ANC due to the lower level of infrastructural development as well as inadequate health personnel in rural areas.

The neighbourhood barriers to health care access had independent effects on quality ANC. Being introduced into the models, there was a change in the variance of the random intercept indicating that the community characteristics did contribute to the variance in quality of ANC use by young women in Ghana. Young women residing in communities with low neighbourhood barriers to health care access were less likely to report receiving quality ANC. The change in the level of

neighbourhood barriers to health care access from high access to low access increased the probability of receiving quality ANC among young women in Ghana. This is in line with several findings that support the fact that quality ANC use may be hampered by a lack of access to health services (Chama-Chiliba & Koch, 2015; Gage, 2007; Kassaw et. al., 2019). It also demonstrates that even if young women stay in an environment where women experience hardships in terms of accessing health care, the quality of ANC use may still be influenced by other factors.

In this chapter, factors associated with the use of quality antenatal care among young women in Ghana have been examined. Using a multi-level approach, the study found that factors such as the educational level and wealth status of women were associated with an increased likelihood of women receiving a higher quality of care. Furthermore, the study observed that place of residence was a predictor that contributed positively to factors that influenced the quality of care although this result was not statistically significant when controlling for other factors. Secondly, it was observed that quality of care was a factor that contributed to women's choice of using prenatal care services (number of ANC visits and trimester of first ANC visit).

CHAPTER FIVE

FACTORS AFFECTING THE UTILIZATION OF SKILLED BIRTH ATTENDANCE AMONG YOUNG WOMEN IN GHANA.

5.1 Introduction

Skilled attendance at delivery is advocated as the "single most critical intervention" to reduce maternal mortality (Souza et al., 2013: p.4). This is because about three-quarters of maternal deaths occur from complications during labour, delivery, and the first 24 hours of postpartum. These complications are difficult to predict but can be effectively managed and deaths averted if they are recognized and treated promptly. Thus, there is the need for a skilled birth attendant (SBA), a health professional who can identify and manage normal labour and delivery; and identify and treat complications or provide basic care and referral at every delivery (Khan et al., 2006).

This chapter examines the factors affecting the utilization of skilled birth attendance among young women in Ghana. Three levels of analysis were performed in this chapter. Cross-tabulation was used to show the percentage utilization of SBAs by young women and the different explanatory variables. Further, multilevel binary logistic regression was used to examine the determinants of SBAs, and finally, mediation analysis was used to test how the quality of ANC will mediate the effects of place of residence and socioeconomic status of young women on the use of SBAs.

5.2 Relationship between Predictors of SBAs

Table 5.1 shows the relationship between the various explanatory variables and the use of SBAs. From Table 5.1, about 72 percent of young women in the sample who had at least one ANC visit

were assisted by SBAs during delivery, though these percentages are not significantly different as seen in the overlap of the confidence intervals. Young women aged 15 – 19 and those aged 20 - 24 years have no statistically significant difference in their use of SBAs during delivery. Thus, about 72 percent of these young women were likely to use SBA during their delivery. Use of SBAs increases with education and wealth: 57 percent of young women with no education compared to 82 percent of young women with secondary and higher education, and about 66 percent among young women from households with low income compared to 82 percent among the rich. Young women who are Christians are more likely to use SBA (73%) whilst 67.8 percent of those who belong to other religious use SBAs during their last delivery. Seventy-four percent of those who were not married were assisted by SBAs during their last delivery compared to 71 percent of those who were married. Likewise, about 67 percent of young women in rural areas were assisted by SBA compared to 78 percent of urban young women. For neighbourhood barriers to health care access, about 63.0 percent of young women who resided in neighbourhoods that were classified as having low barriers to health care access used SBAs during their last childbirth whereas 75.4 percent lived in neighbourhoods classified as having high barriers to healthcare access used SBAs.

Table 5.1 Percent distribution of young women assisted by skilled birth attendants, GMHS 2017

Variables	Number (No= 2,669) No.	Percentage	[95% CI]
Age			
15 - 19	532	71.6	[0.68 - 0.75]
20 - 24	2137	71.5	[0.67 - 0.73]
Highest Education			
None	535	57.0	[0.53 - 0.61]
Primary	543	68.3	[0.64 - 0.72]
JHS	1166	75.7	[0.73 - 0.78]
SHS/Higher	424	82.4	[0.79 - 0.86]
Household wealth index			
Low	1671	69.6	[0.64 - 0.68]
Middle	516	79.8	[0.76 - 0.83]
High	482	82.2	[0.79 - 0.86]
Marital status			
Married	1977	70.8	[0.69 - 0.74]
Not Married	692	73.7	[0.70 - 0.77]
Religious affiliation			
Christian	1892	73.0	[0.71 - 0.75]
Others	777	67.8	[0.65 - 0.71]
Quality of ANC			
Low	850	63.2	[0.60 - 0.66]
High	1819	75.4	[0.73 - 0.77]
Place of Residence			
Rural	1655	67.1	[0.65 - 0.70]
Urban	1014	78.4	[0.76 - 0.81]
Neighbourhood Barriers to health care access			
Low	817	63.0	[0.60 – 0.66]
High	1852	75.3	[0.73 – 0.77]
Region			
Greater Accra	161	77.6	[0.71 – 0.84]
Western	259	70.3	[0.65 – 0.76]
Central	181	70.2	[0.64 – 0.77]
Volta	145	62.1	[0.62 – 0.70]
Eastern	231	68.0	[0.62 – 0.70]
Ashanti	282	72.3	[0.68 – 0.78]
Brong Ahafo	268	77.6	[0.73 – 0.83]
Northern	504	58.1	[0.54 – 0.62]
Upper West	264	75.0	[0.70 – 0.80]

Source: Computed from GMHS data, 2017

The Upper East Region has the highest proportion of young women assisted by SBAs (87%). This was followed by the Greater Accra, Brong Ahafo, and Upper West regions with about 78 percent, 78 percent, and 75 percent respectively. Apart from the Northern Region with 58 percent of the women being assisted by SBAs, the rest of the regions (Ashanti, Western, Central, Eastern, and Volta) had young women assisted by an SBA ranging from 62 percent to 72 percent.

5.3 Factors affecting Use of Skilled Birth Attendants (SBA) among Young Women in Ghana

5.3.1 Bivariate Multilevel Modelling

The statistical significance of the explanatory variables was estimated using Wald statistics, with all results at a 5 percent alpha level considered significant. The results of the bivariate (a measure of association) were presented as odds ratio (OR) at 95% confidence intervals (95% CIs).

Table 5.2 shows the bivariate multilevel logistic regression results for the factors affecting skilled birth attendance among young women in Ghana. Education and household wealth were important predictors of SBA at delivery. Also, the use of SBAs increased with increasing mothers' education and wealth. That is, young women with primary, JSS, and SHS/higher education are 1.6, 2.4, and 3.5 times as likely as women with no education to use SBA respectively. Also, compared to women in the lowest wealth household, those from middle wealth households were about 2.1 times as likely as using SBA, and those from higher household wealth were about 2.4 times as likely as using SBAs compared to women from poor households. Furthermore, young women who received quality ANC were about 1.6 times as likely as using SBAs as those who did not receive quality

ANC. However, women belonging to other religious groups were 22 percent less likely to use SBAs compared to women professing the Christian Religion.

Under the neighbourhood-level predictors, the analysis shows that young women who live in urban areas were about 1.8 times as likely to receive SBA as women in rural areas. Likewise, the results indicated that residing in a province with low degrees of barriers to health care access was positively associated with higher odds of women reporting the use of SBAs for delivery of the last child as young women (Odds Ratio, 1.78). However, the analysis did not find a substantial statistically significant association between the region where young women reside and the use of SBA. For instance, young women from the Northern Region had the lowest odds of using SBA at delivery (60%) compared to young women in the Greater Accra Region.

Table 5.2 Association between Individual and Neighbourhood Variables and Skilled Birth Attendance among Young Women in Ghana.

Variables		OR	95% CI
Individual/Household Variables			
Age in years			
15 – 19	(RC)	1.00	
20 - 24		0.99	[0.81 – 1.23]
Highest Education			
None	(RC)	1.00	
Primary		1.63**	[1.27 – 2.09]
JHS		2.35**	[1.89 – 2.92]
SHS/Higher		3.52**	[2.60 – 4.76]
Household wealth			
Poor	(RC)	1.00	
Middle		2.05**	[1.62 – 2.60]
Rich		2.38**	[1.84 – 3.07]
Religious affiliation			
Christian		1.00	
Others		0.78**	[0.65 – 0.93]
Neighbourhood factors			
Quality of ANC			
High	(RC)	1.00	
Low		1.79**	[1.50 – 2.13]
Place of Residence			
Rural		1.00	
Urban		1.76**	[1.47 - 2.11]
Neighbourhood Barriers to health care access			
Low(RC)		1.00	
High		1.78**	[1.50 – 2.13]
Region			
G. Accra	(RC)	1.00	
Volta		0.47**	[0.29 – 0.78]
Eastern		0.61**	[0.38 – 0.97]
Northern		0.40**	[0.27 – 0.60]
Upper East		1.87**	[1.16 – 3.00]
Ashanti		0.77	[0.49 – 1.21]
Western		0.68	[0.46 – 1.18]
Central		0.68	[0.42 – 1.10]
Brong Ahafo		1.10	[0.62 – 1.60]
Upper West		0.86	[0.54 – 0.37]

Note: *** p < 0.001; **p < 0.05; * p < 0.01
(RC)=Reference Category; C. I=Confidence Interval

5.3.2 Multivariate Multilevel Modelling

Table 5.3 shows the results of the multilevel analyses. The study examined how variability in the utilization of SBAs could be attributed to different sets of variables, with a focus on determining the contribution of neighbourhood-level variables in accounting for the differences. The intra-cluster correlation coefficient (ICC) was used to determine the proportion of differences in SBA use that could be due to intra-cluster variation. Four models were tested to examine the impact of various combinations of factors on the use of SBAs. The first model is an unconditional, "empty" or "null" model, which only contains the intercept but without predictor variables. It is specified to decompose the random effects existing between individual and neighbourhood levels and to estimate the intra-class correlation coefficient (ICC). Model 2 included all individual-level variables while Model 3 included only the neighbourhood-level characteristics. Finally, model 4 examined the effects of both individual and neighbourhood level characteristics simultaneously.

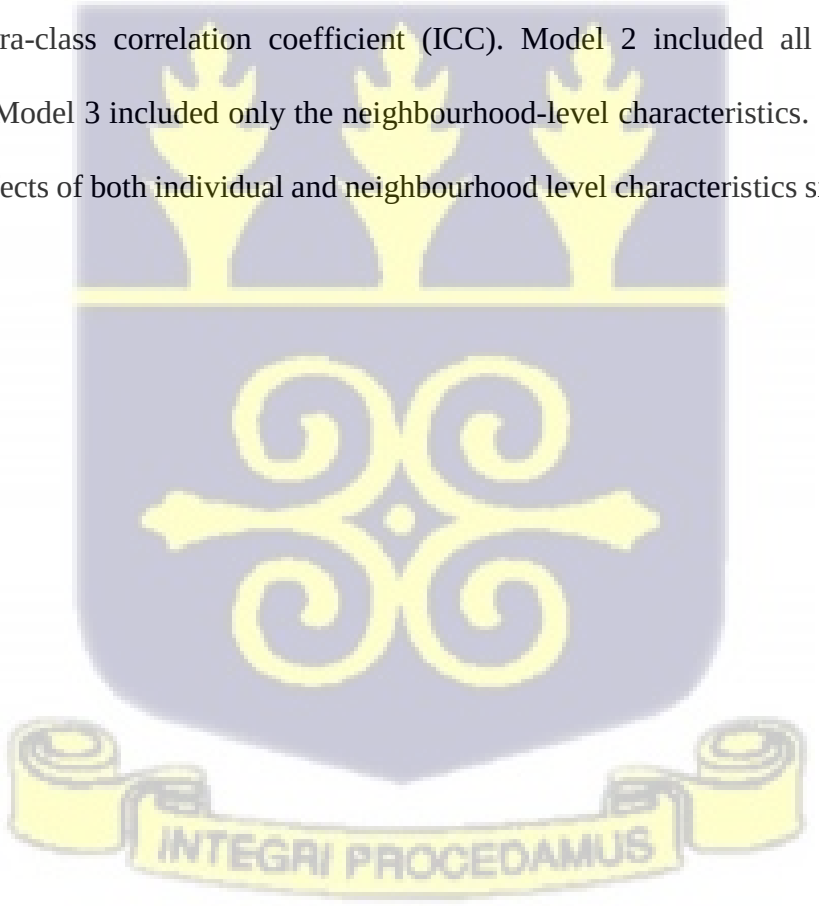


Table 5.3 Multilevel Binary Logistic Regression of Skilled Birth Attendance (SBA) on Quality of Antenatal Care (ANC), Place of Residence, Education, and Relevant Confounders, N=2,669

Use of SBA: s OR [95% CI]

Independent variables	Model 1	Model 2		Model 3		Model 4	
	OR	OR	(C.I)	OR	C. I	OR	C.I
Randoms effects (Neighbourhood Level)							
variance (SE)	0.95**(0.02)	0.65** (0.01)		0.63**(0.02)		0.50**(0.20)	
ICC (%)	22.4	16.5		16.1		13.2	
Log-Likelihood	-1594.4193	-1434.8433		-1513.8685		-1390.5052	
Education							
None (RC)		1.00				1.00	
Primary		1.62**	[1.23 - 2.12]			1.52**	[1.10 – 1.90]
JHS		1.95**	[1.52 – 2.49]			1.82**	[1.39 – 2.37]
SHS/Higher		2.21**	[1.58 – 3.10]			2.13**	[1.52 – 3.00]
Household wealth							
Low (RC)		1.00				1.00	
Middle		1.62**	[1.26 – 2.01]			1.78**	[1.35 – 2.34]
High		1.69**	[1.28 – 2.24]			1.87**	[1.36 – 2.57]
Religion							
Christian (RC)		1.00				1.00	
Others		0.98	[0.84 – 1.30]			1.00	[0.79 – 1.29]
Marital Status							
Married		1.00				1.00	
Not married		0.98	[0.78 – 1.23]			1.06	[0.84 – 1.33]
Quality of ANC							
Low (RC)		1.00				1.00	
High		1.59**	[1.33 – 1.91]			1.53**	[1.27 – 1.85]
Neighbourhood factors							
Place of Residence							
Rural (RC)				1.00		1.00	
Urban				1.81**	[1.48 - 2.2]	1.28**	[1.01 – 1.21]
Neighbourhood Barriers to health care access							
High (RC)				1.00			
Low				1.53**	[1.27 – 1.84]	1.29**	[1.01 – 1.57]

Table 5.3 Continued

Quality of ANC: OR [95% CI]

Independent variables	Model 1	Model 2		Model 3		Model 4	
	OR	OR	(C.I)	OR	C. I	OR	C.I

Region					
G. Accra	(RC)	1.00			1.00
Western		0.01	[0.47 – 0.48]	1.15	[0.69 – 1.92]
Central		0.12	[0.62 – 0.38]	0 .98	[0.58 – 1.68]
Volta		0.35	[0.86 – 0.17]	0.82	[0.47 – 1.42]
Eastern		0.07	[0.55 – 0.41]	1.01	[0.60 – 1.69]
Ashanti		0.02	[0.44 – 0.49]	1.05	[0.64 – 1.72]
Brong Ahafo		0.32	[0.17 – 0.80]	1.60	[0.95 – 2.68]
Northern		0.43	[0.86 – 0.01]	0.95	[0.58 – 1.56]
Upper West		0.39	[0.10 – 0.89]	2.07	[1.23 – 3.48]
Upper East		1.12**	[0.65 – 1.66]	4.51**	[2.68 – 7.61]

Source: computed by author using the GMHS 2017
Note: *** p < 0.001; **p < 0.05; * p < 0.01
(RC)=Reference Category; C. I=Confidence Interval
Model 1-null model
Model 2-individual level only model
Model 3-neighbourhood level only model
Model 4-individual level and neighbourhood level model

Model 1, the empty or null model of Table 5.3 has no individual and contextual level variables added. It examines the random variable and intercepts. The result shows a variance partition coefficient or intra-cluster correlation coefficient (ICC) of 22.4 percent implying that as much as 22.4 percent of the variations observed in the use of SBAs could be explained by neighbourhood-level variables.

Model 2 includes individual-level variables only. This model accounted for 16.5 percent of the variation in SBA use. Statistically significant positive predictors of utilization of SBAs were the educational level of the woman, household wealth level, and quality of ANC received. Education significantly increased the odds of SBA use. The likelihood of using SBAs progressively increased with a woman's level of education, with women having secondary-level education or above being more than two times as likely to use SBAs as women with no education (OR = 2.21, 95% CI: 1.58-3.10). Compared with women in the low wealth quintile, women in the middle and high wealth

quintile were 1.6 times and 1.7 times as likely to use SBAs respectively as those from low household wealth. These associations were statistically significant. Also, compared with women who received low-quality ANC, women who received a high-quality ANC were 1.59 times as likely to use SBAs.

Model 3 examined the neighbourhood factors of interest, excluding individual factors. Place of residence and neighbourhood barriers to health care access were positively and significantly associated with the use of SBAs. Women residing in urban areas are about 1.8 times as likely to use SBAs compared to young women from rural areas. The odds of a woman using SBAs for delivery of their last child as a young woman during the five years preceding the survey was higher for women residing in neighbourhoods with low degrees of barriers to health care access (Odds ratio, 1.53). This means that neighbourhoods that had a low proportion of women reporting at least one serious problem accessing health care were less likely to have young women using an SBA for the delivery of their last child. However, apart from Upper East Region, the rest of the regions were not significantly associated with SBA use compared to Greater Accra.

The final model, (Model 4), was the combination of both individual-level variables and neighbourhood-level variables. Controlling for other factors, the direction in the associations between individual-level variables and SBA use remained the same, albeit with some variations in the strength of the association and levels of statistical significance. However, urban residence, a community-level variable had significantly increased odds of SBA use. At the regional level, while the odds of SBA use were not statistically significant for young women residing in the Western, Central, Volta, Eastern, Ashanti, Brong Ahafo, and Northern regions, the results for their

counterparts in the Upper East and Upper West regions were statistically significant. Compared with women in the Greater Accra Region, young women from the Upper East and West regions were more than two times as likely to use SBAs (OR = 4.51, CI 2.68, 7.61) and (OR = 2.07, CI 1.23, 3.48) respectively.

5.4 Discussion

The significant role played by SBAs for safe motherhood in reducing maternal mortality and morbidity cannot be underscored (Amoakoh-Coleman et al., 2015; Dankwah et al., 2019). The study sheds new insight into the association between SBA and different factors at the individual and neighbourhood levels. At the individual level, the analysis shows that the factors that influence the use of SBAs are education, wealth, and quality of ANC, net of other factors while at the neighbourhood level, place of residence, and neighbourhood barriers to health care access control for other factors were significant.

This hypothesis states that 'the association between individual/household factors and maternal healthcare-seeking behaviour will be moderated by neighbourhood factors. This is based on the assumption that the magnitude of some individual effects on SBAs uses changes as functions of some neighbourhood effects (Vu, 2005). Results of the multilevel analysis showed that neighbourhood variables moderated the effects of the association between individual/household variables and maternal healthcare-seeking behaviour. The inclusion of the community variables in model 4 (Tables 5.3) resulted in the reduction of odds in the use of SBAs during delivery across the categories of individual-level variables compared to results from model 2. This hypothesis is therefore confirmed in the study.

The results have shown that there has been an improvement in the use of SBAs among women in Ghana. The proportion of women who have given birth five years preceding the 2017 Ghana Maternal Health Survey that were delivered by SBAs increased from 55 percent in 2007 to 79 percent in 2017 (Oppong-Asamoah et al., 2017; GSS et al., 2018). The possible explanation could be due to the 58 percent increase in the functional CHPS zones available to pregnant women in Ghana (GSS, 2015). CHPS zones are means of increasing accessibility of health services including SBAs. Most of the CHPS zones now have SBAs who provide delivery services to pregnant women and refer those with complications to higher levels when necessary.

The results are consistent with studies conducted by Mugo et al. (2016) which found that the majority of respondents used SBAs during their last delivery. The similarities in the findings could be due to the predisposing factors of Anderson's (1998) Model which guided the study. Andersen's model suggested that utilization of health services is based on the predisposing factors (personal characteristics) and enabling factors of the individual (Andersen, 1995). The predisposing factors such as age, marital status, education, and religion have a greater influence on the decision of pregnant women to use SBAs. This suggests that the predisposing factors could enhance or deter pregnant women from using SBAs.

Improvement in the general health-seeking behaviour might have also contributed to a larger proportion of women seeking assisted delivery. This improvement in SBA use is consistent with a similar study conducted by Bosomprah et al. (2014) who used a decomposition statistical approach to explain the variation in the observed change in the percentage of SBAs using two successive nationally representative household survey data. Studies employing a similar statistical design in

Ghana through a cross-sectional multi-stage cluster household survey showed that 79 percent of women who had ever given birth in the year before the survey had the assistance of skilled attendance during delivery in the Upper East and Greater Accra regions of Ghana (Esena & Sappor, 2013; Sakeah et al., 2014a) which is consistent with the findings of this study.

The high uptake of skilled delivery service in the Upper East Region could be attributed to the piloting of the Ghana Health Service programme which involved training Community Health Officers (CHOs) as midwives in rural Upper East Region, and the high quality of care provided in the district. The GHS 2005 piloted a programme that involved training of CHOs as midwives to address the gap in skilled attendance in the rural Upper East Region (Gudu & Addo, 2017a).

It has been explained by referring to evaluative study conducted by the Alliance for Reproductive Health Rights in 2014 in four districts (i.e. Agona East and Komenda-Edina-Eguafo-Abirem (KEEA) in the Central Region, and Bongo and Builsa in the Upper East Region) of Ghana on progress made towards achieving MDGs 4 and 5,that indicated that, in the Bongo and Builsa districts, where high scores were recorded for quality of care, respondents described health care workers as caring and they gave prompt attention to mothers. Such a good attitude of health workers contributed to high satisfaction with the services provided. Further, the report indicated that in Bongo, the mothers reported that optimal antenatal and postnatal care was provided by the health care workers as they gave prompt attention to patients, and rated these two services provided at 100 percent. Put together, these two key factors (availability of skilled personnel and quality of care) could have operated to ensure that the uptake of skilled delivery services in the region was high (Gudu & Addo, 2017b).

Regardless of the above-mentioned achievements in Ghana with respect to SBAs use, a recent documentary of the Ghanaian media by Boateng (2017) on the state of maternal health care in the second-largest teaching hospital in Ghana indicates that SBAs/facility-based delivery is not always of high quality and devoid of maternal deaths. The YouTube video entitled 'Next to die' simply means if ten pregnant women require Caesarean sections as an emergency treatment to save their lives and that of their babies, only one or two of them can be saved due to inadequate theatres and equipment to operate. The rest need to wait for their turn, and within the waiting period, they could die or develop complications. Again, due to the number of women waiting for emergency treatment (Caesarean sections), the theatre bed and instruments are not properly disinfected and sterilized before the operations are carried out to save more women from dying. These are the serious situations that women are victims of in their quest to seek skilled delivery at birth that can give them cross infections of various types including HIV/AIDS and Hepatitis.

Another interesting revelation from the YouTube video was that some of the pregnant women were sleeping on the floor while others were sharing a bed. The situation was worst among new-born babies. Three or four new-born babies with infectious conditions shared the same cot due to a lack of space to be able to place a separate cot for each baby. These unfortunate situations and many others occurring to women could be some of the reasons why Ghana could not attain its MDG 5 goal of 185 deaths/ 100 000 live births at the end of 2015. In addition, the YouTube video demonstrates that the health systems in Ghana do not only need more skilled professionals (nurses and doctors) but modern health infrastructure for maternal health care where emergency operations can be performed. This will ensure the availability of care and improve the quality of care for women at all levels of the health system in Ghana. Nonetheless, some of the above-

mentioned findings run contrary to studies in other developing countries where ANC and facility-based deliveries have been reported to be very low compared to the use of maternal services in Ghana after the inception of the MDGs (Amano et al., 2012; Haque et al., 2016; Yebyo et al., 2015).

As seen in this study, many studies also indicate that education and wealth have a positive relationship with the use of SBAs (Asamoah & Agardh, 2017; Ensor et al., 2014; Gabrysch & Campbell, 2009; Sarker et al., 2018). Educational differences also yielded differences in the use of SBAs among respondents. Specifically, respondents with secondary school education were found to use SBAs compared to respondents without any formal education. Multilevel modelling analysis shows that women with a higher level of education were more likely to access SBAs. A plausible explanation is that higher educated women appreciate the benefits of the utilization of SBA compared to those with less education. Findings from previous research support the results of this study that higher educated women are more likely to have access to and seek SBAs during delivery (Huda et al., 2019; Manyeh et al., 2017). Educational attainments, coupled with household wealth are markers of economic resources which empower women to take control of their health and facilitate easy access to SBA. This suggests that the Maternal and Child Health Services User Fee Exemption Programme introduced by the government could have less effect on the use of SBA as other expenses are involved, including travel costs lowering user fees alone may not be enough to encourage poor women to use the facilities. This is consistent with studies in Ghana (Ghana Statistical Service (GSS), 2012; Manyeh et al., 2017) and studies from elsewhere (Chukwuma et al., 2017; Ononokpono & Odimegwu, 2014) where women from poor households were less likely to use SBAs during delivery compared to women from rich households.

Sociocultural factors are a set of variables that in quantitative studies are difficult to examine. Qualitative research identifies pregnancy beliefs and problems, for example labour as a sign of strength, facility delivery as a sign of weakness; requirements for the delivery position, warmness, and placenta handling; and cultural requirements of household privacy during delivery are factors for skilled delivery (Bazzano et al., 2008a; Mrisho et al., 2007b; Thaddeus & Maine, 1994). However, quantitative studies are not able to examine them directly, relating mainly to proxies, such as religion and ethnicity, producing mixed results (Gabrysch & Campbell, 2009; Obeng et al., 2006). In this analysis, we found that young women professing other religions including traditional religion are less likely to use SBA which indicates that the sociocultural factors within this group are more influential. However, when additional factors are considered, religion has no statistically significant influence on SBA use. The finding that women in the Northern Region of Ghana are less likely to use SBA may also reflect the role of socio-cultural factors that affect the use of SBAs which have been identified as being predominant in this region. Nonetheless, poor access to health facilities in this region is also a major problem (Bazzano et al., 2008; Moyer & Mustafa, 2013b).

In most studies, the age of mothers is in most cases treated as a confounder in multivariate analysis investigating the effect of factors on SBA. The results from this current study indicated that mothers' age did not have any effect on SBA use in the multilevel analysis which contradicts the findings of other studies (Manyeh et al., 2017; Shahabuddin et al., 2017) that applied multivariate analysis to establish whether there is evidence that young women have poorer SBA use than older women with similar background characteristics. However, the non-significance of the effect of age in this study is consistent with findings in other studies which saw no statistically significant

relationship between mothers' age and SBA use (Reynolds et al., 2006; Wanjira et al., 2011). It could be inferred that as most of the young women in Ghana are unemployed, they are unlikely to afford SBA during delivery if they do not have valid NHIS (GSS et al., 2015). As a result, these young mothers could end up delivering with the assistance of traditional birth attendance (TBAs) but the free maternal delivery intervention in Ghana is available to every woman independent of her age. This singular policy might have contributed to why age was not seen as a statistically significant factor in SBA use at delivery. Mass education carried out on several radio stations by governmental and non-governmental organizations on the consequences of delivering outside health facilities could have contributed to the larger proportion of individuals having the intention to deliver at health facilities with their current pregnancy (Sakeah et al., 2014a).

The findings of the study are in support of Andersen's Behavioural Model of Health Services Use. The model posits that predisposing factors (education, age, and ethnicity) and enabling factors (place of residence wealth, and health insurance coverage) facilitate the use of any available health service. The enabling factors are based on the argument that even if a family/individual has a predisposition to use health services, certain characteristics must be in place to enable them to access services. This confirms the fact that the education of the pregnant women, the place of residence of the women, and their ability to afford the services of SBAs in terms of owning valid NHIS are important factors, which could strongly determine the woman's intention to use SBAs. According to Andersen (1968), an individual's access to and use of health services are considered to be a function of predisposing factors of social structure and demographic parameters which include education, occupation, ethnicity, religion, social networks, social interactions, culture, access to health insurance, income and age. This study investigated these predisposing factors and

how they influence skilled birth attendance during delivery in health facilities across the country. Except for education, all other predisposing factors investigated were not related to SBAs controlling for other factors. Most of Anderson's predisposing factors are time-varying which shows that those characteristics might have affected skilled birth attendance some years back but may not necessarily be relevant predictors today especially when there is currently ongoing government intervention (free maternal facility delivery policy) where the sole inclusion criterion for enjoying benefits of the intervention is to be a Ghanaian woman independent of one's highest education level, occupation, ethnicity, religion, social networks, social interactions, culture or age. The argument being advanced is that although the education of an individual could also change over time, the propensity is low compared to other identified predisposing factors by Anderson which could still make education an important predictor of SBA use.

Although quality of care is multidimensional, there is still no agreement as to which components should be included in defining quality of care (Deo et al., 2015; Liz et al., 2002). For this study, we needed to include components that have a direct bearing on the utilization of health services. It is possible that the more the number of health care services provided to clients, the more likely it is for clients to perceive it as good. The perception of good quality of health care by clients may be influenced by social and cultural concerns as well. Where there is a perceived good quality of care, women tend to disperse information about the advantages of using SBAs for childbirth. Dispersion of health information in a community with low quality of health care could be poor and women in such areas are more likely to stick to the traditional way of giving birth as it may be deemed natural (Danforth et al., 2009; Montagu et al., 2011). The need to ensure that women are provided with all the basic health care services is essential. That can be achieved through ensuring efficient support

systems by programme managers and ensuring that skilled providers have the technical competency to provide health care services at the health facility.

Consistent with earlier studies, the use of SBAs is positively and significantly associated with the quality of ANC received (Ensor et al., 2014). Women who use SBAs previously would probably have a higher propensity to deliver in a health centre assisted by SBAs because they were more familiar with the previous setting, which could increase their probability of using it once again (Chukwuma et al., 2017; Gudu & Addo, 2017b). It is worth noting that the determinants of SBA use such as religion, previous complications, knowledge of the risks associated with pregnancy and various other factors which influence the preceding SBAs and place of delivery may work in the same way again. The Demographic and Health Survey multi-stage cluster sampling design has shown that the quality of previous ANC assistance corresponds to the intention to deliver in subsequent similar facilities (Bell et al., 2003; Robson et al., 2012). These findings have been supported by previous techniques which have employed qualitative studies and have found that if women are not satisfied with previous delivery, they tend not to deliver with the same provider. They will, however, deliver with the same provider if the delivery went well (Duong et al., 2004). These study findings support the results of this current study that reports that the quality of ANC is associated with the use of SBAs for the current delivery.

Pregnant women's level of satisfaction with previous delivery services or use of health care services may determine whether they will use such services again or not. Low quality of care, particularly poor health workers' attitude is a recurring subject of qualitative studies in Ghana and most of SSA on maternal health services (Moyer et al., 2013a; Ozge et al., 2012). However, very

few quantitative studies assessed the quality of care as a determinant of maternal health care and these have produced quite mixed results because of different approaches to quality of care measurement (Gabrysch & Campbell, 2009). For instance, Stekelenburg et al. (2004) found no effect on the delivery of facilities in a rural district in Zambia from the perceived quality of ANC (measured as a binary variable on satisfaction with antenatal care or not) and attributed the delivery to a high level of satisfaction. However, Wilunda et al. (2015) found that women who perceived the quality of maternal health care to be excellent at the closest health facility were more likely than women who perceived the quality to be poor/average to deliver with SBA assistance. The quality measures in these studies differ from those used in this study, making it difficult to compare. However, the positive association between higher ANC quality and the use of SBAs supports the role of quality of care in this analysis.

Andersen's Behavioural Model of Health Services Use indicates that when an individual evaluates his/her health status, it will tell whether that person needs healthcare or not. The possible explanation will be that the frequent exposure to ANC has given the women enough information about their pregnancy and the unborn baby. This is likely to inform their decision to use SBAs. When individuals are well informed about their health status, they are likely to use health services.

At the neighbourhood level, the study found a statistically significant association between place of residence and the use of SBA during delivery. Women residing in rural areas were less likely to use SBA than urban women, which was in agreement with previous studies in Ghana (Amoakoh-Coleman et al., 2015; Gudu & Addo, 2017; Adu et al., 2018) and elsewhere (Chukwuma et al., 2017; Sarker et al., 2018; Woldegiorgis et al., 2019). The reason could be attributed to differences

in the availability of social services such as educative information about the advantages of using SBAs during delivery and easy access to health care services. This also suggests that urban women do not face the same barriers to physical access as rural resident women; poor roads and the inaccessibility of some rural communities mean that health facility delivery may not be a viable option for some of them. Also, place of residence is generally investigated as a physical accessibility measure because of limited data about actual or perceived accessibility (Bell et al., 2003). However, the place of residence is recognized as a contextual measure that can cover other determinants in the use of SBAs, such as training, capacity to pay, parity, beliefs, availability of information, and quality of services (Gabrysch & Campbell, 2009).

Findings from the multilevel models also indicate that young women residing in neighbourhoods that have high barriers to health care access were more likely to be assisted by BAs during childbirth. This finding corroborates other findings elsewhere (Buor & Bream, 2004; Tanser et al., 2006). The comparison should however be treated with caution because access is defined differently and may have different implications for various health settings. In Africa, access to health care is usually conceptualized using distance-based measures. For example, Buor (2003) related distance to the utilization of health services in Ghana whereas Tanser et al. (2006) used the geographical information system to model primary health care access to utilization in South Africa. In these studies, access is defined and captured using geographical dispersion but the non-spatial domain of accessibility is not captured yet it contributes to being a barrier to utilization of health services including using SBAs for childbirth. The non-spatial may refer to the demographic, socio-economical, and organizational factors (Yao et al., 2013).

Neighbourhood barriers to the health care access index in this study are derived from the neighbourhood proportion of women who report at least one problem accessing health care. The advantage of this approach is that it captures the perceived barriers covering four domains ranging from the household to the nearest health facility. The questions used to cover areas including getting permission, affordability, distance, and health insurance barriers. Yao, Murray, and Agadjanian (2013) have suggested exploring other alternative measures of accessibility. Although one of the domains used to conceptualize neighbourhood barriers to health care access is similar to the ones used in other studies, the approach to measuring access is, however, extends beyond spatial dimensions. This is one of the strengths of the study using multilevel analysis.

CHAPTER SIX

QUALITY OF ANTENATAL CARE AS A DETERMINANT OF PREGNANCY OUTCOME AMONG YOUNG WOMEN IN GHANA.

6.1 Introduction

The recommendations for use of health services during pregnancy and delivery are as important for fetal outcomes as for the mother (Friberg et al., 2010). Since it is difficult to directly examine maternal outcomes (e.g., compare women who die to those who did not because of data limitations, and the relatively small proportions) examining the outcome of the birth or pregnancy outcome is a useful alternative to monitoring the adequacy of care during pregnancy and delivery (Bhutta et al., 2011; Lawn et al., 2011). Antepartum or macerated stillbirths reflect the quality of antenatal care, while intrapartum or fresh stillbirths reflect the quality of delivery care (Lawn et al., 2011). Studying the factors associated with having an adverse pregnancy outcome is therefore important, not only for the sake of saving the nearly three million stillbirths that occur each year (Blencowe et al., 2016c) but for preventing maternal deaths and disability.

This chapter focuses on the quality of ANC and other factors associated with pregnancy outcomes among young women in Ghana based on the 2017 Ghana Maternal Health Survey (GMHS). Preceding the analysis is an examination of the distribution of pregnancy outcomes (stillbirth and miscarriage) by various factors, the background socio-economic and cultural factors, demographic factors, and utilization of maternal and other reproductive health care behaviour using cross-tabulations and Chi-Square tests. The determinants of pregnancy outcomes were examined using multilevel binary logistic regression.

6.2 Relationship between Adverse Pregnancy Outcome and Independent Variables

In this section, the Pearson chi-square test of association was used to measure the association between different explanatory variables and young women's pregnancy outcomes as presented in Table 6.1. All differences shown are statistically significant at $p < 0.05$. The study established that many explanatory variables were highly statistically significant at p = 0.05 with their association with young women's pregnancy outcomes in Ghana. Therefore, based on the bivariate association between independent variables and the outcome variable, young women's adverse pregnancy outcome is significantly influenced by numerous factors both in the individual and neighbourhood levels. Table 6.1 presents a detailed presentation of the association of each variable with the dependent variable with their respective chi-square coefficient values and level of significance.

Table 6.1 Association between the independent variables and young women's Adverse pregnancy outcome

	Adverse Pregnancy Outcome (N = 2,669)			
Variables	**Yes (%)**	**Number**	**Chi - Sq.**	**df**
Age				
15 - 19	10.3	532	41.81*	1
20 - 24	23.0	2137		
Highest Education				
None	14.8	535	13.84*	3
Primary	20.8	543		
JHS	22.2	1166		
SHS/Higher	22.4	425		
Household wealth index				
Low	15.7	1671	63.00*	2
Middle	27.9	516		
High	29.0	482		

Table 6. Continued

Variables	Adverse Pregnancy Outcome (N = 2,669) Yes (%)	Number	Chi - Sq.	df
Religious affiliation				
Christian	22.4	1892	14.42*	1
Moslem	15.8	631		
Marital status				
Married	21.7	1977	7.23*	2
Not Married	16.9	692		
No. of pregnancies (Gravidity)				
1	18.9	1401	8.5*	1
2 plus	23.3	941		
Quality of ANC				
Low	18.2	850	3.78*	1
High	21.5	1819		
Neighbourhood-Level factors				
Place of Residence				
Rural	17.3	1655	26.00*	1
Urban	25.5	1014		
Neighbourhood Barriers to health care access				
Low	17.3	817	7.4*	1
High	21.9	1852		
Region				
G. Accra	27.3	161	100.8*	9
Western	28.6	259		
Central	20.4	181		
Volta	21.4	145		
Eastern	22.5	231		
Ashanti	33.7	282		
Brong-Ahafo	25.0	268		
Northern	9.7	504		
Upper East	12.3	374		
Upper West	19.3	264		

Source: Computed from GMHS data, 2017

**p <0.05, df- degrees of freedom N = 2669*

6.3 Factors affecting Pregnancy Outcomes among young women in Ghana

6.3.1 Bivariate multilevel modelling

All variables in Table 6.1 which showed statistically significant association by chi-square test with pregnancy outcomes were checked by using bivariate multilevel modelling in Table 6.2 and all the variables which were statistically significant at 95% CI were considered to be potential candidates and included in the main model.

Table 6.2 Association between Individual and Neighbourhood level characteristics and Pregnancy Outcomes among young women in Ghana.

Characteristics	OR	95% CI
Individual/Household		
Age in years		
15 – 19 (RC)	1.00	
20 - 24	0.39**	[0.29 – 0.52]
Highest Education		
None (RC)	1.00	
Primary	0.66**	[0.48 – 0.90]
JHS	0.61**	[0.46 – 0.80]
SHS/Higher	0.60**	[0.43 – 0.84]
Household wealth		
Poor (RC)	1.00	
Middle	0.48**	[0.38 – 0.61]
Rich	0.45**	[0.36 – 0.58]
Religious affiliation		
Christian	1.00	
Moslem	1.46**	[1.15 – 1.85]
Traditionalist	3.17**	[1.26 – 7.96]
No religion	1.48	[0.83 – 2.65]
Marital Status		
Married (RC)	1.00	
Not married	1.36**	[1.09 – 1.71]
Quality of ANC		
Low (ref)		
High	0.78**	[0.64 – 0.94]
No. of pregnancies (Gravidity)		
1 (RC)	1.00	
2 plus	0.59**	[0.50 – 0.71]

Table 6.2 Continued.

Characteristics		OR	95% CI
Neighbourhood			
Place of Residence			
Rural		1.00	
Urban		0.61**	[0.53 – 0.87]
Place of delivery			
Home	(RC)	1.00	
Hospital		0.68**	[0.53 – 0.87]
Neighbourhood Barriers to health care access			
High	(RC)	1.00	
Low		0.75	[0.60 – 0.92]
Region			
G. Accra	(RC)	1.00	
Western		0.94	[0.61 – 1.46]
Central		1.46	[0.89 – 2.41]
Volta		1.38	[0.82 – 2.34]
Eastern		1.29	[0.81 – 2.06]
Ashanti		0.74	[0.48 – 1.13]
Brong Ahafo		1.13	[0.72 – 1.76]
Northern		3.49**	[2.22 – 8.50]
Upper East		2.68**	[1.69 – 4.27]
Upper West		1.57**	[0.99 – 3.49]

Source: computed by author using the GMHS 2017
Note: **p < 0.05
(RC)=Reference Category; C.I=Confidence Interval

The binary regression results for the individual-level characteristics are generally consistent with expectations and similarly consistent with previous studies showing the role of individual factors that are significantly associated with the likelihood of experiencing adverse pregnancy outcomes. At the individual level, important factors that are significantly associated with the likelihood of a young woman having adverse pregnancy outcomes include the age of the woman, level of education of the woman, household wealth, religious affiliation of the woman, quality of ANC received by the woman and marital status (Table 6.2). The effect of maternal education was

particularly more consistent. For instance, women with a higher level of education (SHS and higher) show significantly lower odds of suffering from adverse pregnancy outcomes (OR=0.60, p<0.05, CI: 0.43 – 0.84) compared to women with no education. Women with primary and JHS education also have lower odds (OR=0.66 and 0.61 respectively) of suffering from adverse pregnancy outcomes as compared to women with no education. Likewise, compared to women from low household wealth, women from middle and high households were less likely to suffer adverse pregnancy outcomes. There is also a positive association between age and pregnancy outcomes. Women of age 20 to 24 years are more than 60 percent less likely to suffer from adverse pregnancy outcomes compared to women who are 15 to 19.

The quality of ANC has a significant influence on pregnancy outcomes. Compared to women who received low-quality ANC, those who received high-quality ANC have about 22 percent lower odds of suffering from adverse pregnancy outcomes. Women who are not married are about 1.4 times as likely as having adverse pregnancy outcomes as those currently married.

At the neighbourhood level, the bivariate modelling showed that women who reside in urban communities are associated with significantly lower odds of adverse pregnancy outcomes than women living in rural areas. Moreover, living in neighbourhoods with high barriers to health care access has a lower effect on young women's probability of having adverse pregnancy outcomes. However, the Northern, Upper East, and Upper West regions were associated with significantly higher odds of adverse pregnancy outcomes than the Greater Accra Region with corresponding odds ratios of about 3.5, 2.7, and 1.6 respectively. The other regions were not statistically significantly different from Greater Accra Region.

6.3.2 Multivariate Multilevel Modelling

Table 6.3 shows the multilevel results of both the fixed and random effects of individual-level and neighbourhood-level variables that affect pregnancy outcomes. Four (4) models were estimated in the multivariate analysis. The first, unconditional model included no variables and specified only the random intercept. This model presents the total variance in pregnancy outcomes among clusters. The second model adds individual-level variables to the unconditional model. The third model adds neighbourhood-level (but not individual) factors, while the fourth model adds both individual and neighbourhood factors. In addition to the estimate of the variance of the random intercept, the models also include intraclass correlation coefficients. While the variance of the intercept is a reflection of the heterogeneity between clusters, the intracluster coefficients represent the ratio of the between-cluster variance to the total variance and are a reflection of the level of homogeneity within a cluster.

From Model one (the null model) statistically, significant variations were observed in the odds of experiencing adverse pregnancy outcomes across the neighbourhoods ($\tau = 2.07$, $p < 0.05$). Based on the intra-correlation coefficient implied by the estimated intercept component variance, about 39 percent of the variance in the "pregnancy outcomes" could be attributed to neighbourhood-level factors.

Table 6.3 Multilevel logistic analysis of the variables associated with Pregnancy Outcomes among young women in Ghana, N=2,669

	Quality of ANC: OR [95% CI]			
Independent variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR	**OR (C.I)**	**OR C. I**	**OR C.I**
Randoms effects (Neighbourhood Level)				
variance (SE)	2.07** (0.32)	1.82** (0.24)	1.17**(0.24)	0.66**(0.10)
ICC (%)	38.6	35.6	26.2	16.7
Log-Likelihood	-1352.3136	-1272.954	-1304.6003	-1246.3398
Age				
15 – 19 (RC)		1.00		1.00
20 – 24		0.42** [0.30 – 0.57]		0.40** [0.29 – 0.56]
Education				
None (RC)		1.00		1.00
Primary		0.65** [0.48 – 0.94]		0.79 [0.56 – 1.12]
JHS		0.71** [0.57 – 0.97]		0.90 [0.65 – 1.24]
SHS/Higher		0.91 [0.64 – 1.37]		1.05 [0.73 – 1.56]
Household wealth				
Low (RC)		1.00		1.00
Middle		0.48** [0.39 – 0.64]		0.67** [0.51 – 0.89]
High		0.52** [0.39 – 0.70]		0.72** [0.52 – 0.98]
Religion				
Christian (RC)		1.00		1.00
Others		1.48** [1.16 – 1.93]		1.17 [0.89 – 1.55]
Quality of ANC				
Low (RC)		1.00		
High		0.55** [0.39 – 0.77]		0.48* [0.28 – 0.60]
Marital Status				
Married (RC)		1.00		1.00
Not married		1.35** [1.10 – 1.66]		1.49** [1.16 – 1.92]
Neighbourhood factors				
Place of Residence				
Rural (RC)			1.00	1.00
Urban			0.75** [0.61 – 0.93]	0.80* [0.63 – 1.02]
Place of delivery				
Home (RC)			1.00	
Hospital			0.72** [0.39 – 0.86]	0.76* [0.57 – 1.00]
Neighbourhood Barriers to health care access				
High (RC)			1.00	
Low			0.57** [0.55 – 0.94]	0.68 [0.49 – 1.95]

Table 6.3 Continued

Independent variables	Quality of ANC: OR [95% CI]						
	Model 1	Model 2		Model 3		Model 4	
	OR	OR	C. I	OR	C. I	OR	C.I
Region							
G. Accra (RC)				1.00		1.00	
Western				0.79	[0.50 – 1.23]	0.80	[0.50 – 1.29]
Central				1.29	[0.78 – 2.14]	1.39	[0.82 – 2.35]
Volta				1.13	[0.66 – 1.94]	1.17	[0.67 – 2.07]
Eastern				1.07	[0.66 – 1.73]	1.09	[0.67 – 2.06]
Ashanti				0.65	[0.42 – 1.00]	0.68	[0.43 – 1.06]
Brong Ahafo				1.00	[0.63 – 1.60]	1.08	[0.67 – 1.75]
Upper West				1.28	[0.78 – 2.08]	1.41	[0.83 – 2.37]
Northern				2.79**	[1.74 – 4.57]	2.58**	[1.53 – 4.35]
Upper East				2.26**	[1.39 – 3.70]	2.25**	[1.34 – 3.79]

Source: computed by author using the GMHS 2017
Note: *** p < 0.001; **p < 0.05; * p < 0.01
(RC)=Reference Category; C. I=Confidence Interval
Model 1-null model
Model 2-individual level only model
Model 3-neighbourhood level only model
Model 4-individual level and neighbourhood level model

Model two (Table 6.3) which represents individual-level variables, indicates that increasing age was significantly associated with adverse pregnancy outcomes. The odds of adverse pregnancy outcomes decreased with age (OR 0.42, 95% CI: 0.30 – 0.57). Thus, women 20 – 24 years had decreased odds of being at risk of adverse pregnancy outcomes compared with women 15 – 19 years. Women who had primary (OR 0.67, CI: 0.48 – 0.94) or Junior School education (OR 0.71, CI: 0.57 – 0.97) had significantly reduced odds of adverse pregnancy outcomes compared to women without any education. Household wealth was significantly associated with pregnancy outcomes among young women in Ghana, where increasing wealth significantly reduced the odds (OR 0.52, CI: 0.39 – 0.70) of adverse pregnancy outcomes. Likewise, the quality of antenatal care has a statistically significant influence on adverse pregnancy outcomes. Compared to women who

received low-quality ANC, women who received a high-quality ANC had lower odds of experiencing adverse pregnancy outcomes.

Inclusion of the neighbourhood-level factors reduced the neighbourhood variance from 2.07 to 1.82. Thus, the variation in the odds of experiencing adverse pregnancy outcomes across neighbourhoods remained statistically significant ($\tau = 1.82$, $p < 0.05$). Hence, the intra neighbourhood correlation is 0.356. This suggests that about 36 percent of the variation in experiencing adverse pregnancy outcomes is explained by neighbourhood-level effects.

Model three examined the neighbourhood factors of interest, excluding individual factors. Concerning the neighbourhood characteristics, women living in urban areas had lower odds of experiencing adverse pregnancy outcomes compared to those in rural areas. Similarly, place of delivery is significantly associated with decreased odds of adverse pregnancy outcomes. The results also showed that living in a neighbourhood with high barriers to health care access has a lower effect on young women's probability of having adverse pregnancy outcomes (Table 6.3; Model 2). In other words, compared to the neighbourhood with low barriers to health care access, the neighbourhood with high barriers to health care access is associated with lower probabilities of adverse pregnancy outcomes (Odds ratio; 0.76: $p<0.05$). However, apart from the Northern and Upper East regions that are statistically significant in association with significantly high odds of adverse pregnancy outcomes, with corresponding odds of 2.8 and 2.3 respectively, the rest of the regions were not statistically significant in association with adverse pregnancy outcomes.

In the final model, (Model four), when individual-level variables were added to the neighbourhood-level variables, neighbourhood barriers to health care access lost their statistical significance. At the regional level, while the odds of adverse pregnancy outcomes were not statistically significant for most of the regions when neighbourhood-level variables only were considered, in the final model they remained statistically non-significant, while Northern and Upper East regions had results to the contrary. That is, compared with Greater Accra, the Northern and Upper East regions of Ghana had significantly higher odds of adverse pregnancy outcomes (OR 2.58, CI 1.53, 4.35) and (OR 2.25, CI 1.34, 3.79) respectively.

On the other hand, controlling for other factors, the individual-level factors that were found to be important predictors of adverse pregnancy outcomes were the mother's age, household wealth, quality of ANC, and marital status. Compared to women aged 15-19, those aged 20-24 years had 60 percent lower odds of experiencing adverse pregnancy outcomes; and women in the wealthiest households had lower odds of experiencing adverse pregnancy outcomes compared to those in the low-income households (OR 0.72, CI 0.52, 0.98). Compared to women with low quality of ANC, women who had a high quality of ANC had lower odds of adverse pregnancy outcomes (OR 0.55, CI 0.28, 0.60). On the other hand, women who are not married had 49 percent higher odds of adverse pregnancy outcomes compared to women who are married, controlling for other factors. Although maternal education, for instance, had been observed to be a risk factor for adverse pregnancy outcomes, this study shows no variation in adverse pregnancy outcomes by maternal education when other individual-level and neighbourhood-level factors are controlled for.

6.4 Discussion

This chapter examined the factors associated with pregnancy outcomes among young women in Ghana using a nationally representative sample. A key question was whether the quality of ANC affects women's pregnancy outcomes, net of other factors. Also, the hypothesis that, neighbourhood variables are more significant predictors of exposure to adverse pregnancy outcomes than individual and household variables among young women in Ghana. The results indicate that higher-quality ANC reduces the odds of adverse pregnancy outcomes after other factors have been accounted for. In the multivariate analysis, the other maternal health factors associated with the lower odds of having adverse pregnancy outcome are age, education, and wealth. In general, these results are consistent with the results of other studies including studies in Ghana (Asundep et al., 2013; Engmann et al., 2012; Ganchimeg et al., 2014; Mombo-Ngoma et al., 2016; Umar et. al., 2016).

On the other hand, the hypothesis posits that neighbourhood variables are more significant predictors of exposure to adverse pregnancy outcomes than individual and household variables among young women in Ghana. This is based on the assumption that the differences in some individual effects on exposure to adverse pregnancy outcomes are due to functions of neighbourhood or neighbourhood effects (Ononokpono and Odimegwu, 2014). Results of the multilevel analysis in this Chapter showed that neighbourhood variables moderated the effects of the association between individual variables and exposure to adverse pregnancy outcomes. The inclusion of the neighbourhood level variables in Model 4 (Tables 6.3) resulted in the reduction of odds of exposure to adverse pregnancy outcomes across the individual-level variables compared to

results when neighbourhood variables were not included. The result, therefore, confirms this hypothesis.

Whereas ANC has been one of the recommended strategies for improving maternal and perinatal health, it has been challenged to contribute to reducing maternal mortality (Bullough et al., 2005). There is evidence, however, that certain antenatal interventions are efficient, especially in relation to neonatal survival such as serological screening for syphilis, iron supplementation, malaria treatment and prophylaxis, diagnosis and treatment of bacterial asymptomatic bacteria, blood pressure monitoring, HIV immunizations, and mother-to-child prevention (Campbell & Graham, 2006). This analysis provides further proof of the role of quality ANC, not only in reducing adverse pregnancy outcomes but also in good quality of care. The results showed that if every woman who comes into contact with the health system during pregnancy and receives the basic ANC services package, the number of adverse pregnancy outcomes in the country could be significantly reduced. Bhutta et al. (2011), project that a basic package of antenatal intervention, including supplementing or fortification of periconceptional folic acid, malaria prevention, and better detection and management of syphilis during pregnancy and basic comprehensive emergency obstetric care may avert up to 45 percent of adverse pregnancy outcomes.

In Ghana, few national studies have investigated the impact of ANC quality on outcomes of pregnancy among the national population but not specifically among young women. However, the few studies with adverse pregnancy outcomes as an outcome variable have also examined some of the antenatal services. One study based on data from the 2007 Ghana Maternal Health Survey, a national survey of women of reproductive age by Afulani (2016) on the effect of antenatal care

(ANC) quality on women's pregnancy outcomes. The study found that higher quality ANC reduces the odds by nearly half of having a stillbirth after other factors have been taken into account using multivariate analysis (Afulani, 2016). The study also suggests in the mediation analysis that high ANC quality can improve birth outcomes in health care facilities that better manage complications. Nonetheless, the deliveries in public hospitals or polyclinics are more likely to be fatal than those in private and lower-level health care centers (Afulani, 2016).

Another study was also conducted based on monitoring data from the Brong Ahafo Region, using a measure of ANC quality with two tetanus doses during ANC found that women in lower wealth quintiles had a greater risk of adverse pregnancy outcomes and were more likely to receive lower-quality ANC. It has been suggested that the high risk of adverse outcomes among the poor might be due to lower quality ANC, but that the quality of ANC was not directly modelled to predict pregnancy outcomes (Ha et al., 2012). A further facility-based study investigated some ANC components, including screening for anaemia and helminths, tetanus, and nutritional supplements for adverse birth results. In the bivariate models, some services were statistically significant but none in the multivariate models was.

Also, in the bivariate model, delivery in a health facility is statistically significant in association with lower odds of having an adverse outcome compared to deliveries outside a health facility. However, these associations are not statistically significant when other factors were accounted for. If we assume that skilled delivery is expected to improve results even for women who have complications, then several questions arise regarding the statistically non-significant effect of delivery by health facilities on pregnancy outcomes, net of other factors. For example, are health

facilities not doing enough for young women with pregnancy complications? Or young women with complications are reporting late to health facilities that much cannot be done to save their babies and potentially themselves?

In Ghana, many health facilities particularly referral facilities lack basic medical supplies; they are understaffed and insufficiently equipped to prevent maternal, foetal, and early neonatal deaths. Many maternal deaths in facilities can be linked to delays in getting adequate care in good time, despite arrival at health facilities and this equally goes to produce adverse outcomes (Bailey et al., 2019; Issah et al., 2013). Similarly, the population to doctor ratio in Ghana is about 8,481 nationally, but ranges from 3,582 in Greater Accra, the national capital, to 25,878 in the Upper East Region (GHS, 2018). The population to nurse ratio though better is still inadequate. Nationally nurses, are about 542 but range from 351 in Upper West to 647 in the Brong Ahafo region (Ghana Health Service, 2017a). The minimum threshold of health workers to deliver essential maternal and child health services is 23 doctors, nurses, and midwives per 10 000 population (Kinfu et al., 2009). There is also a significant lack of sufficiently trained surgeons capable of performing surgery and obstetric procedures at the first-referral facilities (Abdullah et al., 2011). In recent years, there has been a slight improvement on the population to, doctor and midwife ratios compared to the past few years; however patient loads have increased with the introduction of the National Health Insurance Scheme without a corresponding increase in health workers and capacity of health facilities (Aryeetey et al., 2016; Ghana Health Service, 2017a).

Also, the 2010 Emergency Obstetric and New-born Care (EmONC) assessment found that only 13 facilities in the country qualified as basic EmONC facilities (i.e. have the capacity to perform

seven signal functions needed to manage the leading direct causes of maternal mortality); and 76 qualified as comprehensive EmONC facilities (i.e. have the capacity to perform seven signal functions in addition to surgery and blood transfusion) (Bosomprah et al., 2016). Health centers are supposed to function as basic EmONC facilities. But of the 644 health centers in the country providing delivery services, only three qualified as basic EmONC facilities (Bosomprah et al., 2016). Essential drugs like antibiotics, Magnesium Sulphate, and blood transfusion services, which are needed for managing the leading causes of maternal and foetal deaths in the country are lacking in many health facilities (Bosomprah et al., 2016; Issah et al., 2013).

There were also instances where women in labour are admitted with a live foetus and delivered a stillbirth after several hours because the only midwife on duty was inundated with too many cases and could not monitor each woman carefully, and so did not detect when the baby went into distress. There are times when the only foetal monitor in the unit was broken hence women could not be adequately monitored (Afulani, 2016). Worse still, a diagnosis of foetal distress can be made, but it takes several hours before the mother can have a caesarian section in the referral hospital because several other emergency cases are waiting to have a caesarian section in the only theatre in the hospital, with one doctor and one anaesthetist on duty (Afulani, 2016; Agbozo et al., 2016).

Moreover, delays in seeking skilled attendance, for instance, a woman may have only one blood pressure measurement taken during ANC with no subsequent follow-up, which may results in women with complications until they present in labour with full-blown problems and stillbirth. Also, an initial blood test may not be followed up during antenatal visits unless a woman has

severe anaemia or is in crisis with an adverse outcome and then a higher-level facility is referred to, where not much can be done for the foetus (Afulani, 2016). The poor referral system also increases the risk of the foetus being dead when it arrives at the referral facility even if the foetus is alive at referral.

This study finds that the quality of ANC is important for pregnancy outcomes in Ghana, net of the use of delivery services. It adds to the evidence that good quality ANC is essential for good pregnancy outcomes. It was projected that if 99 percent coverage is reached in 68 priority countries with a package of interventions, including advanced antenatal care and emergency obstetric care "up to 1.1 million (45%) third-trimester stillbirths, 201,000 (54%) maternal deaths, and 1.4 million (43%) neonatal deaths could be saved per year…"(Pattinson et al., 2011: p.1610). Ghana is close to achieving 99 percent coverage for use of ANC but has a long way to go in terms of delivering the essential package of antenatal interventions and providing emergency obstetric services. Lawn et al. (2014: p. 5), called for countries "with third-trimester stillbirth rates of less than five per 1000 total births to eliminate all preventable stillbirths and close equity gaps by 2020, and for all other countries to reduce stillbirth rates by at least 50 percent by 2020. The priority conditions identified for interventions include pregnancy-induced hypertension, antepartum haemorrhage, maternal infections such as syphilis, malaria, and HIV; and obstetric risk conditions such as multiple pregnancies (Lawn et al. 2014). These can be effectively addressed through good quality antenatal and delivery care. Thus, countries in SSA, which bear the greatest burden of adverse pregnancy outcomes (miscarriages and stillbirths), need to step up efforts to improve the quality of ANC to reduce the burden of miscarriages and stillbirths.

In an assessment of health facilities in the country, 46 percent reported that they did not arrange for transportation for women referred to advanced facilities (Nwameme et al., 2014). This means the burden for the woman and her family to find suitable transportation, which increases further delays in getting to a facility that provides adequate care for both mother and child. Some of these factors explain the increased adverse outcome rates in health facilities that are referral points for lower-level health and privately-owned facilities. In addition, some women stay at home when they go into labour, and only go to the health facility when they have developed a complication like haemorrhage or even eclampsia; or have been in labour for so long that maternal exhaustion and foetal death are imminent because of obstructed labour. At this point, health facilities may not be able to offer much, especially with regard to saving the foetus (Afulani, 2016).

Other identified risk factors for adverse pregnancy outcomes among young women are marital status and age (Ganchimeg et al., 2014). Young women aged 19 years and below are thought to have an increased risk of having an adverse pregnancy outcome than those within 20 to 24 years because of an increased risk of complications like obstructed labour (Ganchimeg et al., 2014). On the other hand, marital status is not a known risk factor for adverse pregnancy outcomes, but in this analysis, not married women were associated with higher odds of having an adverse pregnancy outcome, compared to those currently married. This is consistent with the findings from Yatich et al., (2010).

Additionally, the association between place of residence and birth outcomes is another observation that is worth noting. Rural areas are said to account for a larger proportion of adverse pregnancy outcomes globally, especially in SSA (Cousens et al., 2011). The results from the study, however,

show that while rural areas have a larger absolute number of adverse pregnancy outcomes (potentially because of higher fertility), the proportion of all pregnancies that result in an adverse outcome is higher in urban areas than in rural areas (GSS et al., 2007). For example, using all births in the preceding five years in the 2007 GMHS gives a stillbirth rate of 30.6 per 1000 pregnancies (68/2222) for urban and 16.5 per 1000 pregnancies (78/4,738) for rural areas. This is reflected in the analysis which is restricted to the last birth in the preceding five years, with a crude stillbirth rate of 23 per 1000 for urban areas and 13 per 1000 for rural areas (Afulani, 2016).

From the study, in the bivariate model, we also see urban residence is significantly associated with adverse pregnancy outcomes. However, when the other factors were added to the model the urban effect was no longer statistically significant. However, the urban effect is no longer significant with the addition of other variables, suggesting that the place of delivery, and other factors account for a significant effect of the urban difference. To Chapter five and other studies (Gabrysch & Campbell, 2009; Sarker et al., 2018; Asamoah et al., 2016), women in urban areas are more likely to use skilled providers and health facilities for delivery. The results here, therefore suggests that women in urban areas may have other risk factors such as age, hypertension, and obesity for having adverse outcome.

As has been found before (Kent et al., 2013; McElroy et al., 2012), this study established neighbourhood barriers to health care access which is regarded as a neighbourhood-level factor in this study that influences pregnancy outcomes. The results obtained showed that women residing in neighbourhoods with high neighbourhood barriers to health care access had an increased risk of adverse pregnancy outcomes compared to women who reside in neighbourhoods with low

neighbourhood barriers to health care access. This may be because neighbourhoods with high neighbourhood barriers to health care access are marked by poverty which causes women to face unique stressors such as increased isolation, socioeconomic vulnerability, and lack of access to quality health care which may be perpetrated by lack of transport and even longer travel times to cover substantial distances to health care. This can negatively influence the health-seeking behaviour of women, especially during pregnancy. This is mostly true in the context of Ghana as confirmed by the Asundep et al. (2013) study which found that women in deprived areas lack antenatal care mainly due to financial problems. This cost implication was attributed to transportation and distance even though ANC services have been free in public hospitals since 2003.

CHAPTER SEVEN

SUMMARY, IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

7.1 Introduction

The overarching aim of this study was to understand and explain the factors associated with quality maternal health care utilization and pregnancy outcomes among young women in Ghana. The specific objectives were to: examine factors affecting the quality of antenatal care among young women in Ghana; establish the determinants of utilization of skilled birth attendance among young women in Ghana; and establish the association between quality of antenatal care and other factors with pregnancy outcomes among young women in Ghana. These objectives were addressed and answered using the 2017 Ghana Maternal Health Survey data which came out of a large scale nationally representative survey that collected comprehensive information on all facets of maternal health – pregnancy histories of main respondents and deceased siblings, healthcare utilization, abortion experiences, and verbal autopsy to understand much more closely the causes of reported deaths by focusing on young women between the ages of 15 and 24 years who have ever received antenatal care once or more.

The study thus adopted an integrated conceptual framework of Andersen and Newman's (1973) behavioural health model and Donabedian's (1988) quality of care model that embraced both individual-level and neighbourhood-level characteristics to reflect a number of underlying determinants of quality antenatal care and pregnancy outcomes. Quantitative models were used to test the statistical significance of theoretically considered variables or factors.

The use of multilevel models has helped to better understand the varying degrees to which different factors affect the results of population-based data both individually and at the neighbourhood level. Consequently, this chapter summarizes the main results of the study, the study limitations, implications, and recommendations for the scientific and policy communities, and the conclusion.

7.2 Summary

The study found that the results from the logistic regression model at a single level (bivariate) differed from the model at the multilevel logistic regression modelling. In the single-level model, more variables were statistically significant than in the multilevel one. Further, the present study found that simultaneous modelling of individual and neighbourhood levels (multivariate multilevel modelling) provides better explicative models and is better suited to the data. From the analysis, neighbourhood-level random intercepts (variances) for utilization of health services and pregnancy outcomes were statistically significant, indicating very important differences across neighbourhoods. Furthermore, controlling for both individual and neighbourhood level attributes, neighbourhood variance in women's predisposition to use maternal health services and pregnancy outcomes remain statistically significant. Thus, the study showed that individual and neighbourhood characteristics affect the use of quality maternal health services and pregnancy outcomes. However, these factors affect the different health services differently.

7.2.1 Factors Affecting Quality of Antenatal Care among Young Women in Ghana

In the single level (bivariate) model, the individual factors: maternal age, maternal education, household wealth, number of ANC visits, and trimester of first ANC visit, and at the

neighbourhood level: a place of delivery, place of residence, and region were the determinants of quality antenatal care service use among young women in Ghana.

It has been observed that maternal place of residence has a significant relationship with the quality of ANC. Thus, women living in urban areas were more likely to access high-quality ANC compared to the young women residing in rural areas in the bivariate result. However, controlling for other factors, the association between quality of ANC and place of residence was statistically not insignificant. In Ghana, maternal health care is free (Wang et al., 2017), consequently, rural and urban women have almost equal opportunities to receive equal services.

The study also revealed that young women in middle and rich homes are more likely to receive high-quality health care compared to young women from low-income households. This is consistent with a study in 32 lower-income countries including Ghana that found that women from the richest households were 4.25 times higher to receive higher quality and utilize ANC than the poorest women (Guliani et al., 2014). The above indicates that it is difficult for women from poor households to access quality ANC. These conditions may lead to poor maternal and pregnancy outcomes since young women from these households are marginalized economically and as such do not have any additional resources to enhance their health (Ochako et al., 2011).

Therefore, the study shows that if individuals who are socio-economically marginalized are cushioned financially, they are more likely to access maternal health. Thus, these women can have extra available earnings to invest not only in their health but in other domestic appliances, like radio and television, which allow them to access information on safe motherhood, which can

improve their understanding of maternal health and the consequent use of health care (Titaley et al., 2010). This research corroborates previous research that observed that improved social and economic conditions are essential to enhancing maternal health outcomes (Magadi et al., 2006a; Ochako et al., 2011).

In addition, this study found that education is a predictor of the quality of ANC use; as women attain education up to the secondary or higher level, they acquire much understanding of the advantages of seeking quality ANC services compared to women without formal education. This reflects what Findley et al. (2013) emphasized when and only if women's education is enhanced will it unintentionally increase their health status.

7.2.2 Factors Affecting the Utilization of Skilled Birth Attendance among Young Women in Ghana.

Of the women who delivered their last child as young women during the five years preceding the survey, about 72 percent had their delivery assisted by an SBA. The results showed that utilization of SBAs among young women in Ghana is determined by a range of individual/household and contextual factors.

The analysis showed that even though factors such as religion, marital status, and pregnancy outcomes have no direct association with SBAs, place of residence, education, wealth, frequency of ANC visits, and quality of ANC are the factors that influence the use of SBAs. The study shows that the odds of being assisted by SBAs for delivery of the last child by young women were higher for those with primary or higher education compared with women without education. Likewise, an increase in the level of household wealth increased the likelihood of being assisted by SBAs for the delivery of the last child and those from households with higher wealth status. Similarly, it was

generally observed that there was a statistically positive association between ANC visits and a higher frequency of ANC visits and the use of SBAs. However, the positive association between higher ANC quality and use of SBAs supports the role of quality of care in this analysis as espoused by Wilunda et al. (2015) who found women who perceived the quality of maternal health care to be excellent at the closest health facility were more likely than women who perceived the quality to be poor/average to deliver with SBA assistance.

7.2.3 Factors Associated with Pregnancy Outcomes Among Young Women in Ghana.

The study indicates that higher quality ANC reduces the likelihood of adverse pregnancy outcomes. The results also show that women from households with middle or higher wealth status are protected or are less likely to experience adverse pregnancy outcomes compared to their counterparts from poor households whilst living in the urban area is associated with lower odds of experiencing adverse pregnancy outcomes compared to women from rural areas. Controlling for significant observable factors, place of residence and education were no longer statistically significant.

The analysis did not only provide a comprehensive picture of the determinants of the pregnancy outcomes but also shed some light on possible explanations for some of the inconsistencies in the determinants of pregnancy outcomes observed in previous studies. For example, the effect of maternal education and place of residence on pregnancy outcomes is unclear; some previous studies have shown that maternal education and place of residence have an association with pregnancy outcomes. However, in this study education and place of residence were not statistically associated with pregnancy outcomes controlling for other factors. This suggests that

the non-statistical association between education and pregnancy outcomes on one hand and urban residence and pregnancy outcomes, on the other hand, may operate through other factors.

7.3 Implications and Recommendations

First, the fact that most women encounter the health system (that is go for at least one ANC visit) during pregnancy implies there is a window of opportunity for reaching young women with the relevant information and services to improve maternal and pregnancy outcomes. This includes helping them to prepare for skilled delivery care. The gap in ANC and the use of SBAs, therefore, suggests a failure in the system to maximize contact with young women during pregnancy.

Second, disparities in the quality of ANC by SES are not all due to differences in the utilization of health services. This implies that young women of lower SES attending the same level of ANC may be receiving lower-quality care, potentially even within the same health facilities. This lends support to problems within the health system causing disparities in maternal outcomes. In addition, most of the differences in quality of care by place of residence are explained by SES, which suggests that while the quality of care may be generally low, higher quality of care is available to certain groups of women.

Third, the quality of ANC is a statistically significant predictor of the use of SBAs. This suggests that improving the quality of antenatal care is a potential approach to increasing the use of SBAs. This suggests that reducing disparities in the quality of ANC could potentially reduce disparities in the use of SBAs.

Fourth, the statistically significant positive effect of quality of care on pregnancy outcomes implies that improved quality of ANC will not only increase coverage and reduce disparities in the use of SBAs, but it will also have a direct impact on adverse pregnancy outcomes. In addition, increasing the use of SBAs may not result in the expected improvement in maternal and pregnancy outcomes if it does not go concurrently with an increase in the quality of antenatal and delivery care.

Fifth, the non-statistically significant effect of the use of SBAs on pregnancy outcomes suggests that the broad indicator for coverage for use of SBAs may be misleading if we do not know at what point in time women decide to seek skilled attendance at delivery (considering the issues of selection). If young women are seeking skilled care only after complications develop, and are not presenting themselves early enough, such that not much can be done for them, the health outcome indicators will continue to lag behind the coverage indicators. While survey questions asking women about who assisted their delivery and where it occurred are useful, it will also be useful to know at what point women seek and receive skilled assistance.

There has been an emphasis on improving coverage for maternal health services, with relatively less emphasis on the quality of care women receive. Increasing coverage for use of services is important, and this partly involves increasing access to maternal health services. Yet, the use of services will not result in the desired outcomes if it is not associated with the receipt of good quality services. Thus, there is a greater need to maximize the quality of the encounter young women have with the health system during pregnancy. In addition, good quality care from prior encounters with the health systems will increase the likelihood of future use of services, when there is a need. The findings from this dissertation, therefore, call for more efforts to improve the

quality of maternal health services as for improving coverage for use of maternal health services. Interventions to improve the quality of care should include efforts to increase the general quality of maternal health care as well as targeted efforts to increase the quality of maternal health care for rural, poor, and illiterate young women. Improving the quality of ANC will help increase early identification and management of pregnancy complications as well as timely use of skilled delivery services, which will help reduce maternal and foetal mortality and morbidity. Improving the basic quality of care provided to rural, poor, and low-educated young women is also a potential point of intervention for reducing the rural/urban and SES differences in the use of SBAs. In addition, improving the quality of care provided at the existing facilities is a potentially more feasible approach in the short term than increasing accessibility. This is not to say that improving access should not be a priority. However, a little more distant facilities that provide good quality care may be more useful than many facilities providing poor care. As others have suggested, women are willing to travel a little farther to access good quality care.

The timing and frequency of ANC visits explain some of the differences in the quality of ANC and this implies that efforts to encourage women to start ANC visits early and attend the recommended number of visits should be continued. It would, however, be frustrating to health workers, when women who have gone for several ANC visits present during labour with very bad conditions due to complications that were present early in the pregnancy but were not picked up during antenatal care. By implication, ANC has become a social obligation. Such attitudes and behaviours need to change if coverage gains are going to translate into health gains for women. While documentation is important, a shift from monitoring focused on coverage indicators to examining the quality of care women receive, will go a long way to reduce the rural/urban and SES differentials in the use

of SBAs and also improve maternal and adverse outcomes. This analysis did not have the required data to examine the role of quality of delivery care, but there is evidence to suggest that poor quality of delivery care is also contributing to high adverse pregnancy outcomes and maternal deaths (Blencowe et al., 2016; Friberg et al., 2010).

A final recommendation from this study relates to the limited data required to fully understand maternal health-seeking behaviour. The measure of the quality of ANC used in this analysis is based on the variables used to assess the quality of ANC in the major national surveys, and these are the only variables that can be used as proxies for the quality of maternal health care in these surveys. This measure, however, has many limitations including not capturing other dimensions of quality, and even as a process measure. In addition, other factors like perceived need and perceived accessibility could not be examined due to the lack of data. These suggest the need for the development and incorporation of better measures of actual and perceived quality of maternal health services, and perceived need and accessibility (both physical and economic) of health services, into surveys that have maternal health-seeking behaviour as an objective, including the demographic and health surveys. Such data will enable a better assessment of the factors affecting the utilization of maternal health services. The development and incorporation of these measures in surveys will provide the data to examine why we continue to have disparities in the use of SBAs.

7.4 Conclusions

Three gaps have been identified in the efforts to reduce maternal mortality in Ghana. These are coverage gap for skilled attendance at delivery; a quality gap for institutional delivery; and an equity gap for coverage for skilled attendance (Friberg et al., 2010). These also apply to adverse

pregnancy outcomes. The equity gap is not just with respect to coverage, but also top quality. This equity gap in quality may be driving both the low coverage for skilled attendance and high maternal mortality. For ANC, there is a very small coverage gap in Ghana, as many women go for an ANC visit at some point during pregnancy. However, there is a gap in the quality of ANC, which may be easier to address, and could potentially decrease the coverage and equity gaps for skilled attendance at delivery. Reducing the quality gap for both antenatal and delivery care is essential to preventing a large number of maternal and foetal deaths in Ghana and sub-Saharan Africa as a whole. Most countries in SSA were not able to achieve the MDG5 and will need new strategies to meet the SDGs of reducing maternal mortality by 2030. There are also new targets to reduce stillbirths by half and close the equity gaps by the end of 2020 (Blencowe et al., 2016; Goldenberg, 2012). If countries in SSA especially Ghana are to achieve the goals of reducing maternal deaths and adverse birth outcomes, improving the quality of both antenatal and delivery care needs to be given greater priority.

This study aimed to advance understanding of how individual and neighbourhood (contextual) factors affect maternal health and health-seeking behaviour by examining the links between quality of care, use of skilled birth attendance, and pregnancy outcomes. It also sought to extend the evidence to advocate for and develop targeted interventions to improve the quality of maternal health care services, as a means of reducing disparities and improving maternal outcomes. The study shows that the quality of ANC is important for skilled attendance and foetal outcomes; and adds to the research that have been done on the topic. It is hoped that it will extend the conversation from one of generally poor quality of maternal health care in Ghana to that of disparities in quality of maternal health care.

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APPENDIX

Appendix 1 Dependent Variables, Measurement and Coding

Variables	Measurement/Definition	Coding
Pregnancy outcome	Pregnancy outcome refers to whether a woman had a baby born dead or alive in her last pregnancy. It is a computed variable provided in the dataset, created from several questions including: "Was the baby born alive or born dead, or did you have a miscarriage or abortion?	Adverse pregnancy outcome No (0) Yes (1)

	Pregnancy outcome is, therefore, a binary variable coded '1' for adverse pregnancy outcomes and '0' for live births.	
Quality Antenatal care	The quality of ANC is operationalized by an index created from a Principal component analysis of nine binary variables from questions on services women received during their last pregnancy. These include weighing, blood pressure checking; taking a urine sample, taking a blood sample; learning about problems of pregnancies; learning about where to go if they have problems; receiving or telling them to purchase iron supplements; receiving an anthelminthic; tetanus vaccination. The answer to each question was binary (1=Yes; and 0=No).	Quality ANC – Low (0) High (1)
Skilled birth Attendance	Measured as a delivery that were assisted by trained persons. The question on SBA is worded as: "When you gave birth to [name of the last child], who assisted in the delivery? Anyone else?" All persons mentioned are listed and presented in the dataset as seven variables on whether the respondent mentioned a doctor, nurse or midwife, auxiliary nurse or midwife, traditional birth attendant (TBA), relative or friend, other, or no one. I combined these to create a binary variable "use of an SBA": coded as 1 – delivered by an SBA thus, if doctor, nurse or midwife, or auxiliary nurse or midwife was mentioned; and 0 – not delivered by an SBA.	SBA No (0) Yes (1)

Appendix 2 Predictor/Independent Variables and their Measurement and Coding

Variables	Measurement/Definition	Coding
Place of residence	Defined as urban or rural	Rural (0) Urban (1)
Education	Highest level of education attained by respondents	No education (0) Primary (1) JHS (2)

		SHS/Higher (3)
Household wealth index	Household wealth quintile of the respondent derived from the GMHS wealth index. The GMHS wealth index was calculated using household assets. Lowest (1), Second (2), Middle (3), Fourth (4). Highest (5). This was recorded as (Lowest and Second) – Low (Middle) – Middle and (Fourth and Highest) - High	Low (0) Middle (1) High (2)
Antenatal care visit	Measured as the number of antenatal care attendance	≤3 visits (0) 4 or more (1)
Timing of first antenatal visit	Measured as the number of months pregnant when the first ANC was received first trimester (0 to 3 months), second trimester (4 to 6 months), and third trimester (7 or more months).	First trimester (0) Second trimester (1) Third trimester (2)
Type of ANC provider	This is measured as receiving antenatal care from health professionals (doctors, nurses\midwives)	No (0) Yes (1)
Marital Status	This is the marital status of respondents, re-coded into three groups.	Currently married (0) Cohabiting (1) Never Married (2)
Maternal age at last birth	The actual age of the respondent at the time of last delivery. This variable was constructed and calculated by subtracting the century month code (CMC) of the date of birth of the child from the century month code of the date of birth reported by the respondent.	Numeric response 15-19 (0) 20-24 (1)
Religious affiliation	This is the religious affiliation of respondents. The survey provided information on religious affiliation in five categories. For this study, religion is recoded into four categories.	Christian (0) Moslem (1) Traditionalist (2) No religion (3)
Ethnicity	This is defined as the ethnic affiliation of respondents recoded into five categories.	Akan (0) Ga/Dangme (1) Ewe (2) Mole-Dagbani (3) Others (4)

Appendix 2 continue

Variables	**Measurement/Definition**	**Coding**
Region of residence	Defined as geopolitical zones with administrative boundaries, representing socio-economic context.	Greater Accra (0) Western (1) Central (2) Volta (3) Eastern (4) Ashanti (5) Brong-Ahafo (6)

		Northern (7) Upper East (8) Upper West (9)

Appendix 3 Questions for Variables used to create ANC Quality of Care Index, GMHS

As part of your antenatal care during this pregnancy, were any of the following done at least once:

1. Were you weighed?
2. Was your blood pressure measured?
3. Did you give a urine sample?
4. Did you give a blood sample?
5. During (any of) your antenatal care visit (s), were you told about the signs of pregnancy complications?
6. Were you told where to go if you had any of these complications? (asked only if yes to the preceding question).

7. During this pregnancy, were you given or did you buy any iron tablets or iron syrup?
8. During this pregnancy, did you take any drug for intestinal worms?
9. During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?
10. At any time before this pregnancy, did you receive any tetanus injections, either to protect yourself or another baby?
11. Before this pregnancy, how many other times did you receive a tetanus injection?).

Appendix 4 Definitions related to maternal death (ICD-10)

Maternal death: The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Direct maternal deaths: maternal deaths resulting from obstetric complications of the pregnant state (pregnancy, delivery, and postpartum), interventions, omissions, incorrect treatment, or a chain of events resulting from any of the above. E.g. deaths due to, obstetric haemorrhage or hypertensive disorders in pregnancy, or those due to complications of anaesthesia or caesarean section.

Indirect maternal deaths: those resulting from previously existing diseases, or from diseases that developed during pregnancy and that were not due to direct obstetric causes but aggravated by physiological effects of pregnancy. For example, deaths due to aggravation of an existing cardiac or renal disease are considered indirect maternal deaths.

Pregnancy-related death: The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.

Late maternal death: The death of a woman from direct or indirect obstetric causes, more than 42 days, but less than 1 year after termination of pregnancy.

Statistical measures of maternal mortality
Maternal mortality ratio (MMR): Number of maternal deaths during a given period per 100 000 live births during the same period. MMR depicts the risk of maternal death relative to the number of live births.

Maternal mortality rate (MM Rate): Number of maternal deaths in a given period per 100 000 women of reproductive age during the same time. The MM Rate captures both the risk of maternal death per pregnancy or birth (live birth or stillbirth) and the level of fertility in the population.

The **proportion of maternal deaths among deaths of women of reproductive age (PM):** The number of maternal deaths in a given period divided by the total deaths among women aged 15–49 years.

Classification of MMR: MMR is considered to be extremely high if it is ≥1000; high if ≥300;; moderate if from 100 to 299; and low if from 20 to 99 per 100, 000 live births. Most countries in SSA have high MMR; with extremely high in Chad (1100) and Somalia (1000). A few countries in SSA like Mauritius, Sao Tome and Principe and Cape Verde have low MMR and Botswana, Djibouti, Namibia, Gabon, Equatorial Guinea, Eritrea, and Madagascar have moderate MMR. Only four countries (the Lao People's Democratic Republic, Afghanistan, Haiti, and Timor-Leste) outside the sub-Saharan African region have high MMR. (WHO et al. 2012).

Appendix 5 Definitions Related to Skilled Attendance

Skilled birth attendant: "refers exclusively to people with midwifery skills (for example, doctors, midwives, nurses) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer complications. Ideally, the skilled attendance live in and are part of, the community they serve. They must be able to manage normal labour and delivery, recognize the onset of complications, perform essential interventions, start treatment, and supervise the referral of mother and baby for interventions that are beyond their competence or not possible in the particular setting."

Midwifery skills: a defined set of cognitive and practical skills that enable the individual to provide basic health care services throughout the perinatal continuum and also to provide first aid for obstetric complications and emergencies, including life-saving measures when needed.

Skilled attendance is "the process by which a woman is provided with adequate care during labour, delivery, and the early postpartum period." This emphasizes that the process requires a skilled attendant and an enabling environment that includes adequate supplies, equipment, and infrastructure as well as efficient and effective systems of communication and referral. (van den Broek & Graham, 2009).