FERTILITY DIFFERENTIALS IN THE WEST AFRICAN SUB-REGION: A COMPARATIVE STUDY OF GHANA AND NIGERIA

BY

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CERTIFICATION

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DEDICATION

I dedicate the project to God Almighty, who is the Alpha and Omega, whose love and grace have helped me through this course and also to my loving parents **Mr. and Mrs. E.O. Olatoregun.**

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Background:

Nigeria and Ghana are the most densely populated countries in the West African sub region with Nigeria being over 140million people with a population growth rate of 2.4% and Ghana being over 24million people and a population growth rate of 2.2%. This study examined factors encouraging the unprecedented fertility levels in the two countries as well as the differentials in the effect of factors across the countries.

Methods:

A comparative cross sectional study which 33,385 women and 4,916 women aged 15-49 years in Nigeria and Ghana respectively. The outcome variable for this study (fertility level, defined by the number of children ever born by women of reproductive age) was group into Low (less than 2children), Medium (2-4) and High (above 4) fertility. Data were analyzed using descriptive statistics, chi-square and multinomial logistic regression technique in SPSS version 20. All analyses were performed at 5% level of significance.

Results:

The mean age of the women respondents in Nigeria was 28.65 ± 9.49 years and Ghana was 29 ± 9.70 years. The proportion of women respondents in Nigeria and Ghana were less than half of the respondents (45%) were in the age bracket 25 – 39 years while 38% were aged 15 – 24 years. Nigerians seem to have more women living in the rural areas compared to Ghanaian women.

Respondents who were currently married were 2.49 times more likely to have high fertility level against low fertility level than those who were not in unions (OR = 2.49, 95% CI = 2.04-3.04). The odds of high fertility are lower among Nigerian women living in urban areas compared to those that reside in the rural area (OR = 0.94, 95% CI = 0.83-1.06). Also, the odds of high fertility against low fertility are 2.6 times higher among respondents with primary education compared to those with secondary education (OR = 2.64, 95% CI = 2.30-3.04). Respondents with no education are 2.1 times more likely to have high fertility level against low fertility compared to those with the secondary education (OR = 2.06, 95% CI = 1.75-2.42).

Conclusion:

In this study the fertility level of CEB is marginally higher in Urban area among those with no formal education, age at first sexual intercourse and the level of contraceptive use is also still very low especially in the rural areas because of the fear of side effects.

It is suggested that the female education should be beyond the no formal education level reduced infant and child mortality, correct knowledge on the use of contraceptive and awareness were amongst the main factors that affect the fertility level.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The standard of living of any nation on the basis of per capita income is a function of two variables; the National Income and Population (Bayliss, 1969). For a country to live above the waters of underdevelopment, there need to be a balance between these two variables, with this balance defined by a reduced population and an increased income (PRB, 2010). Although it is widely accepted that control of fertility, like the prevention of avoidable deaths, is a public health problem (*Caldswell et al.*, 2002), a country's economy could grow only if her population is held in check (Ashford, 2003; Goliber, 1997; Caldswell *et. Al.*, 2002).

The West African sub-region comprises of seventeen countries with a variety of ethnicity, culture and traditions. Unfortunately the sub-region is currently scarred by internal strife and civil war. It has a population of approximately 250 million people, with over half of this population living in Nigeria. West Africa consists largely of low income countries with Gross National Income per capita ranging from US$1330 in Cape Verde to US$180 in Guinea Bissau and US$130 in Sierra Leone in 2000 with the median Gross National Income per capita being US$330 (Oduro, A.D, 2003).

According to the 2002 report on least developed countries by United Nations Conference on Trade and Development (UNCTAD) generalized poverty is defined as "a situation in which a major part of the population lives at or below income levels sufficient to meet their basic needs and in which the available resources in the economy, even when equally distributed, are barely sufficient to cater for the basic needs of the population on a sustainable basis" (UNCTAD 2002). The low-income per capita figures in West Africa are suggestive of widespread or generalized poverty. On the basis of the purchasing power parity of US$2 a day poverty line the incidence of poverty amongst ten West African countries that are least developed ranged between 60% and 94% during 1995-2000 (UNCTAD 2002). It would therefore be correct to state that there is a generalized poverty in several West African countries. This evidence of widespread poverty in the region is suggestive of a substantial proportion of the population being poor over extended periods of time.

Poverty, religious crisis, low standard of education, poor health delivery services, unavailability of social infrastructures, and low agricultural and industrial production have exacerbated the problem of over-population (UNFPA, 2010; UNESCO, 2001).

According to the 2008 reports of the World Health Organization (WHO), Ghana has a population of over 24 million people and a population growth rate of 2.2% while Nigeria has over 158.3 million and a population growth rate of 2.4%. Nigeria and Ghana are the two most densely populated countries in the West African sub region, accounting for over 70% of the total population. Nigeria is indeed the most populous country in Africa and the seventh most populous in the world, ranked after China, India, United States, Indonesia, Brazil, and Pakistan while Ghana is ranked, twelfth in Africa and the forty-eighth in the world.

World statistics show that about 34% and 31% of the people live below poverty line in Nigeria and Ghana respectively (UNECA, 2009; UNFPA, 2010; Wikipedia, 2011). And despite these low per capita incomes and amidst other socio-economic crisis, the two countries have maintained high levels of fertility (NDHS, 2008; GDHS, 2008). Thus suffer from direct and indirect population problems mostly due to uncontrolled fertility.

Several studies have investigated the relationship between socio-economic, demographic and environmental factors and fertility – a component of population dynamics determining population size (Bongaarts J, 2008; Ramesh Adhikari, 2010; United Nations Population Information Network (POPIN); UNFPA). And reports showed that many countries in the world underwent a marked fertility decline during the 20th century (USAID, 2008). But little data are available from Nigeria and Ghana partly due to low levels of research on fertility and primarily due to lack of routinely collected vital registration data in these countries. Nigeria in particular, lacks a well established vital registration system and therefore rely largely on other sources to estimate the level of fertility and its influence on her population dynamics. These other data sources include censuses and surveys that often collect information on fertility and other important demographic processes, and more importantly, demographic sample surveys from the large international programs among which are the demographic and health surveys such as the NDHS.

1.2 Statement of the problem

Nigeria and Ghana, are countries that have been ravaged by economic challenges which result into a decreasing per Capita Income annually (UNDP, 2010; UNFPA, 2010). In spite of being blessed with abundant valuable natural resources, significant portions of its people are living under extreme poverty. With about 2.3% population growth rate estimated annually, the situation in these countries clearly illustrates the truism that demographic and developmental factors reinforce each other. High fertility and rapid population growth exert negative influences on poor economic and social development. And consequently, low levels of economic and social development provided the climate favoring high fertility and hence rapid population growth (NDHS, 2008; GDHS, 2008).

Thus, under this situation, if one thinks about achieving important national goals, such as, food self sufficiency, accessibility of citizens to health care services, increasing employment opportunities, reducing underemployment, improving housing conditions and so on. Then, one has to identify critical points through which to break into the vicious circle of such unfavorable phenomenon and mobilize sufficient energy and resources to that end (Alene *et al.*, 2008).

In the 1988 National Population Policy, the desire was to achieve a reduction in the total number of children born per woman to four children. One of the major critiques of this policy was the restriction of the number of children to women and the difficulty in its implementation. Hence, it has not been possible to control fertility and therefore a continuous increase in the population.

1.3 Justification for the study

Fertility is of great importance in contemporary demographic research as it comprises one of the greatest areas of discontinuity between National policies and individual goals. In less developed countries, the preferences of many individuals and groups for large families run counter to national policies to limit population growth in the face of low economic growth. Several factors have contributed in sustaining relatively high levels of fertility in the countries.

Efforts to slow population growth, reduce poverty, achieve economic progress, improve environmental protection and reduce unsustainable consumption and production patterns are mutually reinforcing. Sustained economic growth within the context of sustainable development is essential to eradicate poverty. Eradicating poverty will contribute to slowing population growth and to achieving early population stabilization (ICPD, 1994; UNFPA, 2008). However, fertility is one of the three principal components of population dynamics that determine the size and structure of the population of a country (UN, 1983). Differentials in fertility level and fertility pattern in different areas and among population strata or characteristics have been among the most pervasive findings in demography (Cochrane, 1979).

The Demographic and Health Survey serves as one of the richest sources of demographic information in Nigeria and Ghana but the findings are grossly under-utilized largely because of sketchy analysis of the data collected. Therefore it is important to further explore the data particularly on areas pertaining to fertility for a more intellectual relevant information of maximum benefits to policy decision making. It is indeed a waste of resources to spend so much on collecting such a national representative data pay little or no attention to its use. Therefore, the need National Demographic and Health Survey data in Nigeria and Ghana have been examined in this work to identify and compare the main demographic determinant of population in Nigeria and Ghana.

1.4 Research Questions

Using the basic factors of high fertility rate in these two countries, this study therefore empirically examines the following questions;

- Are differences in the Age at first marriage as it affects fertility in Nigeria and Ghana?
- Are the populations of the two countries growing at same rates?
- Of what significance are Socio-demographic factors (such as Education, Religion, and Region) to the rising rate of fertility in these two countries?
- Which of these indicators – Age at First marriage, socio-economic factors e.g. Education, religion, and region has most significantly affected fertility rate in the West African sub region viz-a-viz the two countries? And in how do their effects on fertility compare in the two countries?

1.5 Objectives of the study

Broad Objective

The broad objective of the study is to assess the effect of basic socio-demographic factors e.g. education, religion, age at first marriage on fertility level in Nigeria and Ghana.

Specific Objectives

The specific objectives of this study include:

- To evaluate the effect of basic Socio-demographic factors (such as Education, Religion, Region, and Age at First marriage) on fertility level in Nigeria and Ghana.
- Compare the effects of the socio-demographic factors on fertility in both countries.
- Compare fertility rate in these two countries.
- To identify some factors that might have contributed to the decline in fertility.
- To identify those factors that influences (or are associated with) Total Children Ever born CEB.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The high growth rate of population varies a lot from region to region and from community to community. Population growth is determined by births, death and migration. These factors are in influenced by numerous socio-economic and demographic factors. Which interact in different ways. Some of these factors have been reviewed in this chapter.

2.2 Fertility Theories

Economic theories of fertility assume that parents have the number of children they do because they desire approximately that number, given the cost of birth control. This demand for children at a household level is affected by many socio-economic factors such as the level of human capital of family members, family income and assists and the experience on the child mortality.

2.2.1 Demographic Transition Theory

Demographic transition theory describes how populations change from balanced regimes of high fertility/high mortality to regimes of low fertility/low mortality (Davis 1945; Notestein 1929). Aside from its modeling of three phases of demographic change, which has strong heuristic appeal, prepositional statements articulating casual mechanisms have come somewhat haphazardly in the theory's development. Notestein (1945) original formulation assumed that mortality decline is quickly achieved during modernization, but fertility reduction lags behind owing to traditional ponytails social norms and structures, resulting in a transitional stage characterized by rapid population growth.

As irrational ponytails norms and social structures erode under the onslaught of industrialism, urbanization, individualism, fertility equilibrates with mortality to form a balanced, low-growth demographic regime. This early emphasis on social psychological change was quickly overshadowed by a more policy relevant rational choice focus (szreter 1993) that requires individual - or household-level analysis. For example, Davis's (1963) theory of change and response asserts that mortality reduction is the quintessential harbinger of the demographic

transition: When faced with improved child survival, households must choose between having more children or upward social mobility according to Davis, mobility usually wins. Likewise, Becker's (1960, 1988) new household economics, Caldwell's (1982). Wealth-flows and easterly (Easterlin and Crimmins 1985) supply-and-demand approach all attitude macro social demographic change to the microeconomics of utility maximization. Given the broad influence of Davis's (1963) dictum that macro level explanations of fertility behavior must link to micro-processes (i.e., methodological individualism), the literature has been dominated by search for micro level and proximate determinants of fertility behavior. This rational choice revisionism has adumbrated demographic transition theory's early emphasis on the macro social determination of fertility.

The theory has been weighed down with supplementary arguments drawn from different disciplines, leaving only a hollow core proposing that ...socioeconomic development will lead to natality decline ... sometime after a major decline in mortality. (Beaver 1975:9). As a result, demographic transition theory's explanation for fertility decline, which is indistinguishable from that of modernization theory because of its emphasis on , generalized modernization (i.e. industrialization, urbanization, affluence and education) (Chesnais 1992:356; Simmons 1988:92), has progressed very little over the years . In response, challenges to the historical and contemporary relevance and accuracy of this demographic modernization theory have mounted (Crenshaw 1989). For instance , results from the Princeton European Fertility Project suggest that socioeconomic forces played no role in fertility behavior prior to Europe's demographic transitions , that changes in mortality were not pivotal in those transitions , and that the pace and timing of the fertility decline were driven primarily by tastes and access to contraceptive technology (Knodel and van de Walle 1986). Others question demographic transition theory's applicability to contemporary Third World countries.

Results from the World Fertility Survey question socioeconomic theories of fertility behavior, apparently falsifying the notion that wage workers or women in modern sectors experience lower fertility than they're more tradition counterparts (Cleland and Wilson 1987). These authors and others conclude that education, secularization, cultural diffusion provide checks on fertility (Lesthaeghe and Wilson 1986), while other relegate social structure to a channeling- role that mediates the spread of ideas, attitudes, and information regarding fertility norms and practices (Bongaart and Watkins 1996). Theoretical and methodological

ambiguities and anomalies have taken their toll on demographic transition theory, leading some researchers to conclude that demographic transition theory is near death. (Hirschman 1994). although many midrange theoretical propositions and empirical generalizations have been offered to answer various critiques of transition theory, they provide neither a more parsimonious nor a more compelling general model of demographic regimes.

2.2.2 Economic Versus Ideation Theories of Fertility

Although the final conclusion of the Princeton fertility study has been recently challenged in at least one country and attributed to incomplete data faulty modeling (Galloway et al., 1994), it still stands out in the form of a negative sweeping generalization: a significant fraction of the total decline of fertility in Northern and western Europe during the period 1870-1930 was not due to measurable social and economic transformations, as the conventional demographic transition theory would have it. The observation that fertility levels as well as the pace of decline tend to cluster along regional, ethnic and language boundaries prompted the inference that changes were driven by a diffusion mechanism whereby regional, cultural and language barriers could sometimes offer resistance to a wave of change or, vice versa, precipitate further changes.

Whilst the idea that diffusion may drive the process of fertility decline is quite reasonable and attractive, it was never well formulated, that is, the mechanisms through which diffusion was supposed to operate were never spelled out with precision. Further, testing of this weakened version of the hypothesis was rarely done directly and instead proceeded via a residual test, e.g., what could not be explained by measurable ("structural") factors must be attributable to diffusion. In the aftermath of Princeton fertility study the field experienced the fierce and rigid opposition between two explanatory frameworks. One reduced fertility behavior to be out of some rational decision making by individuals seeking to maximize some type of utility.

Although in its most rigorous form, this framework was introduced in demography as a direct import from economics, a much loose form had already been applied by demographers (the demographic transition theory is a good example). And was also present in formulations apparently very distanced from the utility maximization framework (Caldwell's intergenerational flows is an illustration of this), the other framework, a much more loosely

respondent to influences from cultural factors and adherence to practices and beliefs characteristic of ethnic, language or other groups to which actors belong.

Waves of ideational change originating in a particular social context could sometimes (and under conditions that usually remain opaque) invade-other social context and, if adopted, could go a long way toward explaining the demise of a high fertility regime. An example of this is the idea that 'westernization' is at the root of fertility changes in some developing areas. Nowhere is the contrast between these two frameworks these two frameworks more starkly formulated than in Cleland and Wilson's rendition (Cleland and Wilson, 1987).

According to Lindequist (2011), originally, the study of the dynamics of human population was within the academic scope of demography. However, as de Bruijn (2006) points out, demographic research consisted primarily on assembling data on population and its dynamics, neglecting theoretical research on the forces producing this data: other disciplines – economics, sociology, history, anthropology, biology, psychology and medical science – have invaded the relative vacuum of theoretical substance, justifying the label demography as an interdiscipline.

According to Caterline (2003), the debate that began in the 1950s and is still continuing about the aims of population policy and the nature and scope of interventions can be viewed as a debate about how to weight the various determinants of demographic transition. He also claims that if one follows Notestein's reading of the European historical experience, then the decisive factors are social and economic change, and the availability of contraceptive technology is of little importance. Davis, as well leaves one less than sanguniue about the likely contribution of programs that make family planning and reproductive health services more accessible and less expensive. Coale and Easterlin, provide a stronger rationale for investment in such programs. Rapid population growth – a function of the gap between mortality and fertility declines- has been a primary public policy concern. The demography of pre-transition and post-transition populations differ in many other respects post-transition, the age-structure of the population is older, individuals' lives are far lengthier, and childrearing occupies a much smaller portion of those lives. These outcomes of demographic transition increasingly are the focus of public policy debates about population dynamic.

Lindequist (2011) also presented some of the most important and fundamental theories of fertility and how they might explain the fertility decline in the western world during the 19th century such as:

2.2.3 NOTESTEIN, CLASSICAL TRANISTION THEORY

One of the earliest and most influential theories on demographic transition stems from Frank W. Notestein, an American demographer from Princeton University. He and others (especially warren Thompson and Kingsley Davis) were pioneers in the young field of demographic research in the 1940s and 1950s and developed general ideas on the phenomenon of demographic transition, which are summarized under the label "classical transition theory".

2.2.4 ECONOMIC, CULTURAL AND STRUCTURAL THEORIES

One of the most important and influential lines of reasoning about human reproductive behaviour is the microeconomic theory of fertility. This approach to fertility is based on the rigorous application of microeconomic analysis to fertility decisions. Fertility is examined within the context of a rational household maximizing utility. The standard economic approach to fertility then investigates how the household's fertility decision is interrelated with several influencing factors. Thus, in terms of Coale's three conditions for declining fertility, the economic approach addresses the socioeconomic/ structural dimension.

2.2.5 CALDWELL: WEALTH FLOW THEORY

Another important contribution to the explanation of declining fertility in the Western world during the 19th century stems from John Caldwell, a demographic researcher, who advanced the hypothesis that the direction of "intergenerational wealth flows" is central to the understanding of declining fertility.

In Caldwell's theory, there are two types of society: one in which the "net wealth flows" (present and anticipated) run from child to parents and one in which they run from parents to child. Net wealth flows running from parents to child characterize post-transitional societies.

In pre-transitional societies, children provide a flow of resources to their parents which exceeded their costs. This leads to high fertility. The change in the direction of net wealth flows characterizes the transition from one regime to the other. In the post-transitional societies, children require more resources than they generate which leads to low fertility. In settings where children are economically beneficial parents will have too many children (Child Development Reference, Wikipedia, 2011).

2.3 Proximate determinants of fertility

Fertility levels in sub-Saharan Africa are among the highest in the world. The recent fertility declines in a few countries have gained the attention of researchers and policy makers. According to Davis and Blake (1956), the factors affecting fertility can be classified into two groups: background variables and intermediates or proximate variables. The background variables include cultural, psychological, economic, social, health and environmental factors while the proximate is those factors that have a direct effect on fertility. The background factors operate through the proximate determinants to influence fertility; they do not influence fertility directly.

Bongaarts et al. (1984) enumerated nine major proximate determinants of fertility at the societal level: marriage or union patterns, contraception, lactational amenorrhea, postpartum abstinence, pathological sterility, and induced abortion, frequency of sexual intercourse, spontaneous intrauterine mortality, and natural sterility.

Use of Contraception: the major determinant of the fertility in modern times in most countries is the use of contraception to regulate fertility. Unexpected or unplanned pregnancy poses a major public health challenge in women of reproductive age, especially in developing countries. It has been estimated that of the 210 million pregnancies that occur annually worldwide, about 80 million (38%) are unplanned, and 46 million (22%) end in abortion. More than 200 million women in developing countries would like to delay their next pregnancy or even stop bearing children altogether, but many of them still rely on traditional and less effective methods of contraception or use no method at all.

Those who do not use any contraceptive method may lack access or face barriers to using contraception. These barriers include lack of awareness, lack of access, cultural factors, religion, opposition to use by partners or family members, and fear of health risks and side

effects of contraceptives. In Nigeria, unintended intercourse is the primary cause of unwanted pregnancies, and many women with unwanted pregnancies decide to end them by abortion. Since abortion is illegal in Nigeria (unless medically recommended to save a mother's life) many abortions are carried out in an unsafe environment.

The consequences of these clandestine abortions are grave and can be life-threatening, often leading to maternal death. Abortions account for 20%–40% of maternal deaths in Nigeria. Many factors contribute to unwanted pregnancy in Nigeria, and a very important factor is the low level of contraceptive use. In addition, a desire to limit family size to enable the family to provide a better education for the children, the increased participation of women in the labour force, and urbanization are other factors leading to the desire of Nigerian women to have a predetermined number of children. Contraceptive prevalence rates have correlated with maternal mortality and it has been shown that countries with low contraceptive prevalence rates are also countries with very high maternal mortality ratios.

Nigeria has one of the highest maternal mortality ratios in sub-Saharan Africa, and ranks as the country with the second highest number of maternal deaths in the world, with illegal and unsafe abortions contributing 20%–40% of about 60,000 maternal deaths that occur yearly in Nigeria. Similarly, the rate of induced abortions is a good indicator of the current state of medical care and family planning in any country. Among Nigerian women of reproductive age, one in seven (14%) has tried to have an abortion, and one in 10 (10%) have actually ended an unwanted pregnancy, suggesting up to 760,000 induced abortions annually.

The use of modern contraceptive methods translates into the prevention of unwanted pregnancy and subsequent abortions. If contraceptive use in the population increases among Nigerian men and women who are sexually active, there will be a significant reduction in unwanted pregnancies and abortions leading to reduced maternal mortality. Research in Nigeria indicates that more than 60% of women with an unplanned pregnancy are not using any form of contraception. This literature review of contraception use in Nigeria identifies reasons for low levels of contraceptive use, the factors responsible for this low utilization, and recommends interventions, programs, and policies to increase contraceptive utilization. In addition, the review provides recommendations and direction for future political policy changes and is intended to serve ultimately as a guide for population and demographic planning.

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Contraceptive use and choices

Contraceptive use and choices vary widely in Nigeria according to type of health facility, geopolitical zone, and within urban or rural settings. Various factors, related to both supply and demand, account for these variations and contribute to the low levels of contraceptive use and choices in Nigeria. On the supply side are issues such as limited availability, quality, and cost of family planning services. As a consequence of limited availability, any Nigerians (particularly in rural areas) lack access to modern contraceptive and family planning services. In areas where services do exist, their quality is often poor, with inadequate contraceptive supplies, insufficient numbers of trained service providers, poor interpersonal skills on the part of providers, and limited essential equipment.

Research on factors associated with demand for contraceptives and family planning services in Nigeria has identified the relative powerlessness of women (especially in northern Nigeria), household poverty, low level of education (especially in northern Nigeria), myths and rumours about modern contraceptive methods, parity, pronatalist attitudes, and widespread preference for male children, as key influences on contraceptive use. In addition to these factors, and especially in northern Nigeria, early marriages and early initiation of sexual activity have contributed significantly to the high fertility and subsequent higher prevalence of maternal and fetal complications. The various contraceptive choices and related issues peculiar to Nigeria are outlined below:

i. Condoms

According to the 2003 Demographic and Health Survey (DHS), the condom is reported to be the main contraceptive method known of and used by Nigerian women of reproductive age. The extensive marketing of condoms in response to the human immunodeficiency virus (HIV) epidemic, with the active involvement of both government and nongovernmental organizations, has been responsible for this increased awareness and subsequent increase in condom use. Condoms are also the preferred choice for post partum contraception, especially among educated women with high parity. Studies in Nigeria have indicated that because patent medicine stores are common sources of contraceptives and because condoms are readily available over the counter at these stores, there is much less restrictive on contraceptive purchases and use compared with the family planning clinics and health facilities where there are more restrictions.

ii. Oral contraceptive pill

As already stated above, OCPs, like the condom, are readily available over the counter at patent medicine and pharmacy shops in Nigeria. They are also available at the health facilities, and are the second contraceptive method of choice for women of reproductive age, particularly younger unmarried females and students. A significant problem in Nigeria is a general lack of adequate information about the OCP. The myth that prolonged use of the OCP leads to permanent sterility has limited its use in Nigeria and may explain why most young females in Nigeria, especially students, prefer to use abortion instead of contraception for unwanted pregnancy. Also, the protective effects of OCPs are virtually unknown by the majority of women in the Nigerian population.

iii. Female sterilization

Female sterilization by tubal ligation is not a common or acceptable contraceptive choice in Nigeria. However, this method is commonly used worldwide, especially in developed countries and in some developing countries in Asia and South America. Many factors can influence decision-making about sterilization in Nigeria, including religion, ignorance, and superstition based on ancient beliefs, even among more literate members of the community. The acceptability of sterilization in Nigeria and other developing countries might be influenced by the high cost of the procedure, scarcity of skilled providers (especially in rural areas), and fear of surgical complications.

Nigerian studies had shown that the demand for tubal ligation is low, but is commonly accepted in conjunction with another surgical procedure, such as a cesarean section or laparotomy for repair of uterine rupture. Possible surgical complications when using the Pomeroy's technique of tubal ligation via laparotomy or the mini-laparotomy route (the latter being the most common) includes uterine perforation, bladder and intestinal injuries, and intra-abdominal bleeding, although the occurrence of these complications was found to be minimal.

Further, for the majority of the users, sterilization was the first and the last method of contraception; according to the NFHS 82 per cent of women had not used any other method of contraception before accepting sterilization. While the use-effectiveness of sterilization is higher than that of other methods and certainly much higher than that of traditional methods,

contraceptive use cannot increase very rapidly because couples adopt it only when they are ready to limit their family size.

The suppressing effect of lactation on the resumption of ovulation after childbirth is of demographic interest, particularly in societies like Ghana where use of modern contraception is low.

Unwanted pregnancy, abortion and contraception

Many Nigerian women of reproductive age experience an unwanted pregnancy and resort to abortion. According to a DHS survey of women in south-western and northern Nigeria, at least 20% reported having experienced an unwanted pregnancy. The 2003 DHS found that of the total live births reported in the three years prior to 2003, 15% were also reported to be unplanned. A community-based survey of 2,093 women aged 15--49 years about the factors associated with unwanted pregnancy was conducted in eight states of Nigeria in 2002–2003. The results indicated that 28% of women reported having an unwanted pregnancy and, of that 28%, half reported having attempted to end their last unwanted pregnancy.

Forty-three percent of the women who sought an abortion did so because they were either not married, too young, or still in school. Of the women who were not practising contraception, 44% said they were unaware of family planning services, 22% stated that they did not have access to contraceptive services, contraceptive services were too expensive, or they were afraid of side effects. Therefore, at the time of that survey, 27% were at risk of unwanted pregnancy and almost 50% were unaware of contraceptive methods.

Unwanted pregnancy is the leading cause of unsafe abortion in Nigeria. Abortions contribute to 20%--40% of all maternal deaths, constitute an economic drain on the Nigerian health system, are expensive for women, 63 especially for those who develop complications leading to pelvic inflammatory disease (PID), infertility and/or ectopic gestation. It has also been noted that some women use abortion as a means of child spacing instead of using modern contraception. Fear of future infertility was the overriding factor in adolescents' decisions to rely on abortion rather than contraception. Many perceived the adverse effect of modern contraceptives on fertility to be continuous and prolonged, while abortion was seen as an immediate solution to an unplanned pregnancy.

Despite the legal restriction on abortion in Nigeria, 27% of physicians in private practice perform the procedure. Indirect evidence from the 1990 and 2003 DHSs suggests that the number of abortions occurring in Nigeria is on the increase. For example, the percentage of women aged 21–24 years who had premarital sex before the age of 20 years, making them likely to be at risk of unwanted pregnancy during their adolescent years, increased from 27% in 1990 to 32% in 2003. In both surveys, contraceptive use remained low, with the 2003 DHS suggesting that only 13% of married women used any contraceptive method.

The extent to which women resort to abortion has a direct effect on fertility levels, independent of other proximate determinants, because abortion ends a pregnancy. Abortion may be spontaneous or deliberately induced to end an unwanted pregnancy or malformed pregnancy, which may be life threatening, or to end a pregnancy with a foetus of the wrong sex. The extent of spontaneous abortions in a population may depend on the nutritional status of women or maternal health. However, induced abortions depend upon the cultural, religious and societal norms and attitudes as well as on the legal status of abortion in the country. However, it is widely held that the incidence of induced abortion is grossly under-reported in the surveys for a complex set of reasons.

There is still a stigma attached to reporting induced abortion. Women or couples often do not inform their immediate relatives about having resorted to abortion and are unlikely to report it to the investigators. Sometimes induced abortions were reported as spontaneous abortions. Even if the reference period of the survey requires women to recollect the outcomes of all pregnancies since marriage until the time of the survey, some events, which do not result in live births, are omitted. In the four-district Gujarat study, while 9 to 15 per cent of all women who were interviewed reported having experienced a spontaneous abortion, only about 1 to 2 per cent reported an induced abortion. The total abortion rate worked out from the reported occurrences ranged between 0.1 and 0.2 per woman, with large rural urban differences within the districts [Visaria et al 1995].

Abortion is not used as a method of family planning in Ghana. Since 1985 a new provision on abortion has been enacted to clarify the conditions under which an abortion may be safely and legally performed. The lack of data on abortion precludes linking contraceptive failure with abortion Tawiah E.O (1997).

2.4 Proximate determinants of fertility in Nigeria

Data from the 1981-82 Nigeria Fertility Survey (NFS) are used to identify the key proximate determinants of fertility in Nigeria. The patterns of their individual and collective effects are analyzed in a search for possible sources of fertility change. Exposed to the risk of childbearing through first marriage is found to be the most important proximate determinant of Nigerian fertility. Subsequent to marriage, fertility is determined mainly by breastfeeding and postpartum sexual abstinence. Where fertility shows significant socioeconomic variations, there are equally identifiable patterns of the impact of the proximate determinants which explain these differentials to a large extent. On a national scale, the observed patterns of the impact of the measured proximate determinants do not appear to suggest that Nigerian fertility is soon to experience a large decline.

Using data from the 1981-82 Nigeria Fertility Survey, key proximate determinants of fertility in Nigeria are identified. Such markers are sought in the context of this country's estimated 1990 population of 110 million, growing at the rate of 3.5%/yr. The national total fertility rate is 6.4, with 6.2% of fecund, non-pregnant married women employing modern contraception. Considering as corollary factors respondent's age, female and husband's education, and region and type of place of current residence, individual and collective effect patterns were analyzed to look for the sources of fertility change. The most important determinant was found to be childbearing through first marriage, followed by practice and duration of breastfeeding and postpartum sexual abstinence. Marital disruption and contraception play reducing roles in urban fertility; though inadequate to offset the factors supporting fertility increase in more rural areas of Nigeria. Overall, impact patterns as observed do not suggest reductions in Nigerian fertility in the near future. Moreover, traditional, controlling practices of breastfeeding and sexual abstinence are at risk of succumbing to modern influences. Such a development would demand a marked upswing in the practice of modern contraception in Nigeria to combat the rampant population growth.

2.5 Ghana's Demographic Transition:

Issues pertaining to reproductive health are taken seriously by developing countries, if the Millennium Development Goal of improving maternal health is to be achieved. To meet the targets of reducing by three quarters the maternal mortality ratio and achieve universal access to reproductive health care, research into reproductive needs is of paramount importance.

Ghana has been experiencing a reduction in fertility levels over the last two decades. Total fertility rate (TFR), which stood at 6.4 in the late 1980s decreased to 5.5 and 4.6 in 1993 and 1998 respectively and further decreased to 4.4 in 2003. Meanwhile, the contraceptive prevalence rate has remained persistently low at 25 percent. This suggests that another factor(s), besides contraceptive use, may be more important in shaping Ghana's fertility transition. Although there is no direct information on induced abortion, the application of an indirect technique (neo-residual method) provides insightful clues that induced abortion may chiefly account for the disjoint between Ghana's declining fertility and the low contraceptive use. Using the 1998 and 2003 Ghana Demographic and Health Surveys, and guided by Bongaarts' proximate determinants of fertility model, I compute an internal consistency accuracy measure to validate the indirect technique and estimate the fertility inhibiting effects of the proximate determinants. I find that, while postpartum infecundability is the most significant inhibitor of fertility, induced abortion is, increasingly, a major birth inhibitor. In view of these findings, I recommend that, care for complications from abortion should be an integral part of primary health care system.

2.6 Socio-demographic determinant of fertility

In most countries of the sub- Saharan Africa, population growth rates are still quite high (about 3% per year) and the prospects for fertility declines are still quite remote in many of the countries of the continent. (Singh and Casterline, 1985, NAS, 1993; UN, 1987).

Socioeconomic factors that have important influence in lowering fertility preferences and rates are: educational attainment (especially women's), employment opportunities (women's), Rural/Urban residence, availability and accessibility of health and family planning services. Education and rural-urban differentials are among the most widely studied socioeconomic factors in individual fertility change.

Agarwala (1962), Goyal (1988) provided ample evidence of differentials in age at marriage by religion, being lower among Muslims than the Hindus. Krishman (1976) analyzed factors influencing fertility behaviour. In his study he observed that there is an impact of education on fertility behaviour of the couples in kerala state. He found negative relation between education and fertility behaviour among the couples of kerala state. Shastri (1977) observed the level of income has a positive effect on knowledge of family planning method. The educational level is influencing the adoption and use of family planning method. Halli,

(1987) observed in his study that minority fertility is lower than that of majority at upper socio-economic levels and higher at lower socio-economic levels. Gulati (1989) attempted to analyze about the role of contraception and determinants of fertility in the Asian countries. He observed that the female's literacy, improvement in mortality condition, process of industrialization, educational levels, status of women, and contraception depicts significant impact on fertility.

Bashir Ahmed (1990) examined determinants of desired family sire of rural Bangladeshi women. The study had taken 5513 sample size of ever-married women between 10-49 years. It was a two-stage analysis. In the first stage numeric and non-numeric responses for desired family size were examined. In the second stage determinants of desired family sire of those women who expressed numeric desire of the desired family sire were examined. Logit and multiple-linear regression models were adopted. The results indicated that older women, uneducated women without work experience and Muslim women expressed non-numeric response for the desired family size. Wife's education and work experiences were positively related to expression of numeric response. One of the interesting findings of the study was that those women whose husbands were engaged in agricultural activities desired they have a number of children than those women's husbands were engaged in non-agricultural occupation.

Lukshmonasamy (1991) examined the issue of demand for children among rural families in Tamilnadu. The study was based on a sample of 670 households from 16 villages. The data were obtained through primary surveys during May. October 1985. Children ever born were used as fertility measure. The OLS estimates of the fertility equation suggested that equality of male and female had a negative impact on fertility. But the effect of husband's education was more significant. The impact of high cane on fertility was negative because of better access to education and contraception while the nuclear families had the negative impact infertility.

MariBhat P.M and Francis.A.J (2005), by using multivariate analysis of regression, observed that in rural areas, the number of children born alive for Muslim couples with effective marital duration of 36 years or more was 8 percent higher than the corresponding number for Hindu couples 6.6 and 6.1 respectively. The data for urban areas shows that household size is larger among Muslims than Hindus in every cumulated percentile group. SC and ST variables

show negative contributions because they tend to act to reduce the Hindu- Muslim differences in fertility measures.

In the study of KulkarniP. M and Manoj Algarajan (2005), the socioeconomic characteristics are to be controlled by those that possibly influence fertility. Multiple regressions were used for the analysis. Demographic research has recognized education, income, residence (rural or urban), occupation, or work participation as possible factors that have a bearing on fertility. The fertility influenced by education is most commonly observed in most societies. The socio-economic factors do not seem to explain the religious differential in fertility. Of the four proximate determinant of fertility, contraceptive use is the one of that is commonly cited as the prime factor contributing to religious differentials in fertility.

Navaneetham.K and S. Philip Morgan, (2005), Krishnaji.M and J-K.S 2005 in their study on religion and fertility found that natural fertility is defined as fertility in the absence of deliberate control of contraception and births. Muslims is showing similar fertility preference as the Hindu using modem contraceptive methods to the same extent.

Hence the earlier studies on socio economic variables determining fertility shows there is difference in determinacy of fertility from study to study and across region and across population.

2.7 Socio-cultural Factors

In addition, several authors have tried to document the fertility decline in sub-Saharan Africa (Caldwell et al., 1992; Caldwell, 1994; Castro-Martin, 1995; Cleland et al., 1994; Gaisie, 1996; Gould and Brown, 1996; Lesthaeghe and Jolly, 1995; McNicoll, 1992; National Academy of Sciences, 1993; Ngom and Fall, 2005; United Nations, 2001; van de Walle and Foster, 1990) while methods have been used to document the onset of the fertility decline in sub-Saharan Africa. Specifically, Cohen (1998) compared cohort (parity) and period fertility (total fertility rate [TFR]) to analyze the transition in Botswana, Côte d'Ivoire, Ghana, Kenya, Lesotho, Namibia, Sudan, Tanzania, and Zambia. Kirk and Pillet (1998) applied Bongaarts' model to many sub-Saharan African countries to document the impact of contraceptive use on fertility trends.

Socio-cultural characteristics can affect the proximate determinants either directly or through education or occupation. For example, the timing and prevalence of marriage and the practice and duration of breastfeeding and postpartum sexual abstinence are culturally determined. Different socio-cultural groups may exhibit different sexual behavior which influences the level and prevalence of infertility (Frank, 1983). Also, the adoption of fertility control may vary according to religion, ethnicity or marriage type, polyynous or monogamous (Gage, 1995; Addai 1999).

In Nigeria, Akpotu (2008) undertook a study on Education as correlate of Fertility Rate among Families in Southern Nigeria. Adewuyi (1986) took a study on the Interrelations between duration of residence and fertility in a Nigerian primate city. Makinwa -Adebusoye *et al.* (1991) investigated the Quantum and Tempo of Fertility in Nigeria. Adewuyi (1991) also investigated the Regional Patterns and Correlates of Birth Interval Length in Nigeria.

On the other hand, in Ghana, White *et al.* (2002) undertook a study on Urbanization and the Fertility Transition in Ghana. Furthermore, Migration and Fertility in Ghana: Beyond Rural-Urban Differentials (Short Title: Migration and Fertility in Ghana) was investigated by Chattopadhyay *et al.* (2001). Salway (1994) researched on how attitudes toward family planning and discussion between wives and husbands affect contraceptive use in Ghana.

Outside the shores of the West African region, in Ethiopia for instance, Alene *et al.* (2008) investigated the Differentials in fertility in North and South Godar Zones. Demographic, socio – economic and cultural factors affecting fertility differentials in Nepal by Ramesh (2000) was another study in this area. Socio-cultural factors in decisions related to fertility in remotely located communities: The case of the Suri ethnic group by Eyayou et al (2004) is also a study in this regard.

2.8 Overview of Fertility in the world and Sub-Sahara Africa

Between the 1970s and the 1990s, fertility declined markedly at the world level. The median total fertility for all countries with data available dropped from 5.4 to 2.9 children per woman over the period concerned. Most of that reduction was caused by the decline of fertility in developing countries, whose median total fertility changed from 5.9 to 3.9 children per woman between the 1970s and the 1990s.

There were also significant, though smaller, reductions in the fertility of developed countries, whose median total fertility declined from 2.3 to 1.4 children per woman over the same period. Except for the Democratic Republic of Congo, French Guiana, Guinea and Mali, all other developing countries with data available for the 1970s and the 1990s appear to have experienced reductions in fertility levels, though estimates of change may be biased by differential reporting errors in the basic data. Nevertheless, the data presented in this report reveal an overall picture validated by other assessments of fertility trends.

The median fertility reduction in developing countries between the 1970s and the 1990s was of the order of 1.8 children per woman and a quarter of all developing countries appear to have achieved reductions of 2.6 children per woman or more. China is one of the countries in this group, having reduced its fertility by about 4 children per woman since 1970. Other countries with large reported reductions of fertility include Algeria, the Islamic Republic of Iran, Mexico, Thailand, Tunisia and Turkey. In contrast, fertility declined slowly (by less than one child since 1970) or not at all in 21 developing countries, 13 of which are in sub-Saharan Africa. Among developed countries, fertility reductions were the rule, though their magnitude was generally small but significant given the low levels of total fertility that already characterized most of those countries by the 1970s.

The median reduction of total fertility among developed countries was of 0.8 children per woman and by the 1990s only four developed countries i.e. Albania, Iceland, New Zealand and the United States of America, report of total fertility of 2 children per woman or higher. In the 1970s, 36 developed countries had levels of fertility of at least 2 children per woman. Taking 2.1 children per woman to represent a level of fertility ensuring population replacement when mortality is low, fertility levels in 12 developed countries were below replacement level in the 1970s whereas just one developing country had a similarly low level of fertility. By the 1990s, the number of developed countries with below-replacement fertility had increased to 41 and that of developing countries stood at 19. In 14 developed countries, total fertility was lower than 1.3 children per woman, a level unprecedented for large populations in recorded history.

The worldwide reduction of fertility has been accompanied by major shifts in the timing of childbearing. In half of all developing countries, the mean age at which women have children

has decreased as the fertility rates of older women decline. In developed countries, the major tendency has been for the mean age at childbearing to rise as women postpone the beginning of childbearing. Data on the mean age at the birth of the first child indicate that it has generally been rising, both in developed and in developing countries. Increases in the mean age of mothers at the time of the first birth have been more pronounced in developed countries, three-quarters of which have seen their mean age at first birth rise by at least 1.7 years between the 1970s and the 1990s.

In developing countries, such increases have been more modest, amounting to at least 0.5 years in three-quarters of all developing countries with data for the two periods. Consequently, important differences in the timing of first births remain between developed and developing countries. In the 1990s, the median value of the mean age at first birth was 26.4 years in developed countries and just 22.1 years in developing countries. Important changes have also occurred with respect to the level of childlessness among women aged 45-49. Although the countries having comparable data for the 1970s and the 1990s are few, the available evidence suggests that there has been an important reduction of childlessness in Africa, where sexually transmitted diseases were an important cause of sterility in the 1950s and 1960s. In Latin America as well the levels of childlessness have generally dropped.

In other major areas there have been both increases and decreases of childlessness but, whereas levels of childlessness in the 1990s are fairly low in Africa and Asia (never surpassing 9 per cent and remaining in most countries below 5 or 7 per cent, respectively), they are high in the Caribbean and in developed countries. Thus, in three out of every four developed countries, at least 7 per cent of women aged 45-49 were childless in the 1990s and in three-quarters of Caribbean countries with data on the subject, the proportion of childless women among those aged 45-49 was at least 8 per cent. Particularly high levels of childlessness (above 10 per cent) were recorded in Canada, Estonia, Finland, France, Luxembourg, the Netherlands Antilles, Portugal, the Republic of Moldova, Romania, Switzerland and Uruguay.

2.9 Level of fertility in Nigeria

The level of current fertility in Nigeria is important because of its direct relevance to the population policies and programmes. Measures of current fertility are, age – specific rates

(ASFR), the total fertility rate (TFR), the general fertility rate (GFR), and the crude birth rate (CBR). Age-specific fertility rates show the age pattern of fertility. Numerators for the ASFRs are calculated by identifying live births that occurred in the three-year period preceding the survey and classifying them by the age of the mother (in five-year age groups) at the time of the child's birth. The denominators of the rates represent the number of woman-years lived by the survey respondents in each of the five-year age groups during the specified period. The TFR refers to the number of live births a woman would have if she were subject to the current age-specific fertility rates throughout her reproductive years (15-49 years). The GFR represents the number of live births per 1,000 women of reproductive age. The CBR is the number of live births per 1,000 populations. The latter two measures are based on the birth history data for the three-year period before the survey and the age-sex distribution of the household population.

The total fertility rate (TFR) is a more direct measure of the level of fertility than the crude birth rate, since it is refer to as births per woman. The 2008 NDHS results indicate that the TFR is 5.7 births per woman. This means that, on average, a Nigerian woman will give birth to 5.7 children by the end of her childbearing years. The current TFR of 5.7 is the same as that reported for the 2003 NDHS. Fertility peaks in age group 25-29 with 265 births per 1,000 women and declines thereafter.

2.10 Level of fertility in Ghana

Ghana, like the most tropical African countries, is characterized by high fertility. In 1969 the Government of Ghana published a population policy paper with the specific objective of reducing fertility (Republic of Ghana, 1969). However, despite the formal adoption of a population policy and national family planning program, the impact on high fertility levels to date has been minimal. Ghana has made substantial progress in reducing fertility. One of the major indicators provided by the DHS surveys in Ghana has been the current fertility rate, which is important for development of population policies and programmes.

The 2008 GDHS findings indicate that the main childbearing years for Ghanaian women are during their 20s and early 30s. Urban-rural differences in childbearing rates are evident for all age groups, but are especially large in the early 20s. Fertility among rural women is highest in the age group 20-24 (243 births per 1,000), while among urban women, fertility peaks later in

the age group 25-29 (173 births per 1,000). The total fertility rate (TFR), which is calculated for women age 15-49, is a useful measure for examining the overall level of fertility.

According to the GDHS a Ghanaian woman who is at the beginning of her childbearing years will, on average, give birth to 4.0 children by the end of her reproductive period (if fertility levels remain constant at the levels observed in the three-year period preceding the 2008 GDHS). The TFR for rural areas (4.9 births) is higher than the rate for urban areas (3.1 births); however, over the past five years the TFR in rural areas declined from 5.6 to 4.9, while the rate in urban areas remained the same.

2.11 Fertility rates in Africa, sub-regional levels

Since the 1960's, many developing countries have experienced rapid fertility decline, the tempo of the decline appears to have been slower in Africa. Despite these high rates, available literatures show that fertility decline has spread to most of sub-Saharan African countries over the past twenty years (Kirk and Pillet, 1998; Shapiro, 2007; Tabutin and Schoumaker, 2004). In the mid 1980s only a few sub-Saharan countries had experienced a significant decrease of its fertility, by the early 2000s, fertility had started to decline in most sub-Saharan countries at different pace (Tabutin and Schoumaker, 2004).This fertility decline is linked to modernization and although the beginning of the desire of limiting family size preference, increased the family planning and a positive progress of socioeconomic determinants are usually seen as the main driver of the fertility decline.

In most countries of East Africa, population growth rates and the total fertility rate are still high. It is well known from demographic history of the world and from recent and current country experiences that levels of socioeconomic development have power full influence on fertility change (Casterline, 2001). Previous literatures discussed the various socioeconomic factors that served to maintain fertility at high level in Africa, especially in East Africa. As indicated earlier by the early 1980s, total fertility rate which is the key indices of fertility was beginning to fall in few Africa nations. Over the past twenty years, scholars provide evidence that the spread of fertility decline throughout sub-Saharan region including the selected countries in this study (Shapiro and Tambashe, 2003, Shapiro et al., 2003).

Numerous studies on fertility of sub-Saharan Africa prior to the 1990s found fertility rates to be very high. Several suggestions were advanced for this phenomenon. First, it was argued that the region has a cultural and anthropological peculiarity with respect to fertility and parenting (Caldwell and Caldwell, 1987). This view stresses the unique character of African values, institutions and practices which include easy access to marriage, a permissive attitude towards multiple partners, and a supportive kingship and household patterns which make children less of a burden to parents (Isiugo-Abanihe, 1983). Another reason proffered for high sub-Sahara African fertility is the low socio-economic status of the region (World Bank, 1989). Yet another school of thought argues that most sub-Saharan African countries have peasant economies, with high demand for labour; given this situation of high demand for more hands to help in these peasant economies, high fertility is imperative in the region (Kamuzora, 1987).

Others postulate that fertility levels were high in the sub-Saharan Africa region as a consequence low level of deliberate fertility control through contraception or induced abortion (Frank and McNicholl, 1987). However, from the mid-1990s discussions on sub-Saharan Africa fertility has changed from the determinants of high fertility to the factors that have triggered the widespread fertility decline being observed in many countries. There is now a large volume of literature which suggests that sub-Saharan Africa has entered its fertility transition stage following fertility declines in Botswana, Kenya, Ghana, Republic of South Africa, Nigeria, Senegal, Lesotho, Swaziland, Namibia and Zimbabwe. Key fertility determinants responsible for these declines are increased use of modern contraception, improvements in female education and economic conditions, reduction in infant mortality rates, changing attitudes about large family sizes, and modernization (Caldwell and Orubuloye, 1992; Vanderpost, 1992; Rutenberg and Diamond, 1993; Thomas and Muvandi, 1994; Robinson and Harbison, 1995; Onuoha and Timaeus, 1995; Agyei-Mensah, 1997 and Codjoe, 2004).

2.12 Controlling high fertility in West Africa

Africa is the last region in the world to enter fertility transition and it is doing so at a different rate from other developing countries. Since, the population growth rate in sub-Saharan Africa is higher than elsewhere owing to the reduction in infant mortality. The question

demographers' ask is how fast can the fertility decline goes into progress in the countries where it has already began and when it is going to begin in the rural areas of west African?

The theoretical approaches to explain how to control high fertility. According to Pathé and Poirier, 1991 emphasis the means of controlling fertility and the importance of access to contraception for initiating and spreading fertility decline.

Based on Caldwell's work (1976, 1978) the theory of intergenerational wealth flows explains the process of changes from high fertility to low fertility by a change in the value placed on children.

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CHAPTER THREE
METHODOLOGY

3.1 RESEARCH DESIGN

The study design is a comparative cross sectional survey using a secondary data analysis of the 2008 Nigeria Demographic and Health Survey as well as the 2008 Ghana Demographic and Health Survey, which was the fourth of its kind conducted in Nigeria and the fifth in Ghana since the commencement of National Demographic and Health Surveys (NDHS) in 1988. The unprecedented success of the 2008 NDHS and GDHS was made possible by the contributions from a number of international organizations and individuals.

3.1.1 STUDY POPULATION

The 2008 Nigeria Demographic Health Survey (NDHS) is on a nationally representative sample of 33,385 women aged 15-49 years and 15,486 men aged 15-59 years. The 2008 GDHS sampled a total of 11, 778 households in which all eligible women age 15 – 49 years (4,916) and 6,141 eligible men age 15 – 59 years were interviewed respectively but only the data for the women was considered. The survey covered all 36 states of Nigeria and participants were selected through a stratified two stage cluster design while the 10 regions in Ghana as well as the rural and urban areas utilizing a two stage sample design (systematic sampling). Data collection took place over a three month period from early September to late November 2008.

The data contained relevant information to inform programme managers and policymakers on levels and trends in fertility; nuptiality; sexual activity; fertility preferences; awareness and use of family planning methods; infants and young children feeding practices; nutritional status of mothers and young children; early childhood mortality and maternal mortality; maternal and child health; and awareness and behaviour regarding HIV/AIDS and other sexually transmitted infections. In addition, the 2008 NDHS collected information on malaria prevention and treatment, neglected tropical diseases, domestic violence, fistulae, and female

3.2 Data Quality

The NDHS and GDHS implementation team reported numerous efforts made to minimize both sampling errors and non sampling errors. Some of such measures involved: the use of multi stage sampling method, intensive training of supervisors, field editors, interviews, quality control personnel and data processing personnel. Nevertheless, sampling errors were calculated for selected variables and can be obtained from the final reports of the 2008 NDHS & GDHS published by the National Population Commission (NPC) and ORC Macro.

3.3 DEFINITION OF TERMS

Age-specific fertility rates (ASFR) are expressed as the number of births per thousand women in a specified age group and represent a valuable measure for assessing the current age pattern of childbearing. They are calculated by dividing the number of live births to women in a specific age group by the number of woman-years lived in that age group.

Total fertility rate (TFR) is the total number of births a woman would have by the end of her childbearing period if she were to pass through those years bearing children at the currently observed age-specific fertility rates. The TFR is obtained by summing the age-specific fertility rates and multiplying by five.

General fertility rate (GFR) is the number of live births occurring during a specified period per 1,000 women.

Crude birth rate (CBR) is the number of births per 1,000 populations during a specified period.

3.4 DATA ANALYSIS

The data was analyzed using SPSS version 20.0 to produce the summary statistics and other descriptive statistics on the socio-demographic and other relevant characteristics of the women. Such relevant information includes: current age of women, total children ever born, age at first marriage, age at first intercourse, wealth index, education, marital status.

Pearson's Product Moment Correlation Coefficient (r) (Norusis, 2004) was used to assess the relationship between two quantitative variables while the chi-square test was well used to investigate any association between two categorical variables at 5% level of statistical significance.

3.5 Analysis of factors associated with women fertility levels i.e. Children Ever Born (CEB) using Multinomial Logistic Regression

Logistic regression analysis (Norusis, 2004) was used to determine variables associated with fertility levels as measured by mean number of children ever born.

CEB which is the outcome/ dependent variable in the analysis was recoded into three categories:

- Low fertility < 2 children coded as 0
- Moderate fertility between 2 – 4 children coded as 1
- High fertility > 4 children coded as 2

Hence, logistic regression was applied to identify those factors which are associated with the odds of having more than four children based on the information obtained during the survey using low TCEB (0) as a reference group.

3.5.1 Multinomial Logistic Regression

Multinomial logistic regression is employed when the response variable is polytomous, i.e. taking $r > 2$ categories. Where r = number of responses.

In fitting the multinomial logit model, the outcome variables; ever use of a modern or traditional method (0 = never used; 1 = used a modern method; 2 = used a traditional method), as well as ever use of temporary or permanent method (0 = never used; 1 = used a temporary method; 2 = used a permanent method) were used.

For a dependent variable with K categories, the existence of K unobserved continuous variables, $Z_1, \ldots\ldots Z_k$, are considered, each of which can be thought of as the "propensity toward" a category. Here, Z_k represents a woman's propensity toward selecting the K^{th} method of contraception, with larger values of Z_k corresponding to greater probabilities of choosing that method (assuming all other $Z's$ remain the same).

Mathematically, the relationship between the $Z's$ and the probability of a particular outcome is described in this formula.

$$\prod_{ik} = \frac{e^{Z_{ik}}}{e^{Z_{i1}} + e^{Z_{i2}} + \ldots\ldots\ldots + e^{Z_{ik}}}$$

Where

$\prod_{ik}$ is the probability that i^{th} case falls in category k

Z_{ik} is the value of the k^{th} unobserved continuous variable for the i^{th} case

Z_k is also assumed to be linearly related to the predictors.

$$Z_{ik} = b_{k0} + b_{k1}x_{i1} + b_{k2}x_{i2} + \ldots\ldots\ldots\ldots + b_{kJ}x_{iJ}$$

Where

x_{ij} is the j^{th} predictor for the i^{th}

b_{kj} is the j^{th} coefficient for the k^{th} unobserved variable.

J is the number of predictors.

If Z_k were observable, linear regression to each Z_k would simply be fit, and be done. However, since Z_k is unobserved, the predictors to the probability of interest must be related by substituting for Z_k.

$$\prod_i = \frac{e^{b_{k0}+b_{k1}x_{i1}+\ldots\ldots\ldots+b_{kJ}x_{iJ}}}{e^{b_{10}+b_{11}x_i+\ldots\ldots+b_{1J}x_{iJ}} + \ldots\ldots + e^{b_{K0}+b_{K1}x_{i1}+\ldots\ldots+b_{KJ}x_{iJ}}}$$

As it stands, if a constant is added to each Z, then the outcome probability is unchanged. This is the problem of non-identifiability. To solve this problem, Z_K is (arbitrarily) set to 0. The K^{th} category is called the reference category or "standard" category to which others would be compared, because all parameters in the model are interpreted in reference to it (for convenience sake).

$\prod_{ik}$ (With constants added to $z's$)

$$= \frac{e^{Z_{ik}+c}}{e^{Z_{i1}+c} + e^{Z_{i2}+c} + \ldots\ldots + e^{Z_{iK}+c}}$$

$$= \frac{e^{Z_{ik}}e^{c}}{e^{Z_{i1}}e^{c} + e^{Z_{i2}}e^{c} + \ldots\ldots + e^{Z_{iK}}e^{c}}$$

$$= \frac{e^{Z_{ik}}}{e^{Z_{i1}} + e^{Z_{i2}} + \ldots\ldots + e^{Z_{iK}}}$$

$$= \prod_{ik}$$

The coefficients are estimated through an iterative maximum likelihood method.

Using Low TCEB (0) as the reference category, a model for moderate TCEB relative to Low TCEB will be fit.

Since the parameter estimates are relative to the reference group, the standard interpretation of the multinomial logit is that for a unit change in the predictor variable, the logit of outcome *m* relative to the referent group is expected to change by its respective parameter estimate (which is in log-odds units) given the variables in the model are held constant.

Level of Measurement Requirements

- Multinomial logistic regression analysis requires that the dependent variable be non-metric. Dichotomous, nominal, and ordinal variables satisfy the level of measurement requirement.
- Multinomial logistic regression analysis requires that the independent variable be metric or dichotomous. Since SPSS will automatically dummy-code nominal level variables, they can be included since they will be dichotomized in the analysis.
- In SPSS, non-metric independent variables are included as "factors." SPSS will dummy-code non-metric IVs.
- In SPSS, metric independent variables are included as "covariates." If an independent variable is ordinal, we will attach the usual caution.

Assumptions and Outliers:

It is assumed that the odds ratios of any two categories are independent of all other response categories. For example, if a new product is introduced to a market, this assumption states that the market shares of all other products are affected proportionally equal. Also, given a covariate pattern, the responses are assumed to be independent multinomial variables.

Multinomial logistic regression does not make any assumptions of normality, linearity, and homogeneity of variance for the independent variables.

SPSS does not compute any diagnostic statistics for outliers. To evaluate outliers, the advice is to run a multiple binary logistic regression and use those results to test the exclusion of outliers or influential cases.

Sample size requirements

The minimum number of cases per independent variable is 10, using a guideline provided by Hosmer and Lemeshow, authors of Applied Logistic Regression, one of the main resources for Logistic Regression.

For preferred case – to – variable ratios, we will use 20 to 1.

Multinomial Logistic Regression (MLRM)

$$P_r(y_i = k) = \frac{\exp(X_i . \beta_k)}{1 + \sum_{j=1}^{J} \exp(X_i . \beta_j)}$$

- Dependent variable categories as 0, 1, 2 with 0 being the reference category.
- The regressions are, for $k = 1, 2$
- Where y_i is the observed outcome of the ith observation on the dependent variable
- X_i is a vector of the ith observations of all the explanatory variables
- And β_j is a vector of all the regression coefficients in the jth regression.

3.5.2 Explanatory variables

The explanatory variables used in the regression model include age, region, place of residence, educational level, occupation, wealth index, religion and other characteristics relating to the women's fertility, sexual behavior such as marital status, number of unions and ever use of contraceptives. The categories of variables used in the regression model are presented in Table 1.

Table 1. Variables used in MLRM and their categorization

Variables	Responses
Age of Respondents	15-24, 25-39, > 39
Place of Residence	Urban, Rural
Education Level	No Education, Primary, Secondary/Higher
Religion	Orthodox Christian, Moslem
Wealth Index	Poorest, Poorer, Middle, Richer, Richest
Current Martial status	Married, Others
Occupation	Not Working, Skilled, Unskilled
Drinking Water	Piped, Protected well, Unprotected well
Age at First Intercourse	<14, 15 – 19, >20
Age at First Marriage	<14, 15 – 19, >20
Use of contraceptive	Yes, No

CHAPTER FOUR

RESULTS

4.1 Frequency distribution of respondent by selecting Socio demographic characteristics

The socio demographic characteristics of the women in the entire survey are shown in Table 4.1. There were almost an equal proportion of women respondents with the similar age pattern but less than half of the respondents (44.5%) were in the age bracket 25 – 39 years while 37.8% were aged 15 -24 years. Nigerians seem to have more women living in the rural areas compared to Ghana

In Nigeria, about 71% of the respondents were currently married higher than 60% recorded in Ghana while about quarters (25.2%) were never married in Nigeria lower than the 31% observed among Ghana women. Also the Ghanaians had a higher proportion of formerly married women than Nigerians. The relationship between marital status and country was highly statistically significant (chi square= 346.323, P<0.0001).

Also about 45% had Secondary Education (44.6%) lower than 55% observed in Ghana and more than a third of the women had no formal education compared to about a quarter in Ghana(25.3%).

There was a preponderance of Christians in both countries but more pronounced in Ghana with a ratio of more than 4:1 than Nigeria where it was only 12:1. The differences observed in the two countries were also statistically significant (P<0.00001).

The proportion of women not working in Nigeria (37%) was higher than the 22% recorded in Ghana. The Ghanaian women also had a higher proportion of skilled workers (38%) than their Nigerian counterparts (22%) as shown in the last panel of table 4.1. The distribution of the wealth index appeared similar in both countries but Nigeria slightly appears to have more people in the richest quintile and lower in the poorest quintile. The proportion of women drinking unprotected well water in Nigeria (46%) was higher than the 21% recorded in Ghana.

Table 4.1 Socio demographic characteristics of Nigeria and Ghana DHS 2008

Variables	Nigeria Frequency (%) N=33385	Ghana Frequency (%) N=4916	Chi square	P value
Age Group				
15 – 24	12626(37.8)	1906(38.8)	5.199	0.074
25 – 39	14854(44.5)	2090(42.5)		
>39	5924(17.7)	920(18.7)		
Marital Status				
Never Married	8397(25.2)	1546(31.4)	346.323	0.000
Currently Married	23578(70.6)	2950(60.0)		
Formerly Married	1409(4.2)	420(8.5)		
Residence				
Urban	11934(35.7)	2162(44.0)	305.617	0.000
Rural	21451(64.3)	2754(56.0)		
Education				
No Formal	11942(35.8)	1243(25.3)	425.692	0.000
Primary	6566(19.7)	999(20.3)		
Secondary	14878(44.6)	2670(54.3)		
Religion				
Christian	17907(53.6)	3630(73.8)	2100.026	0.000
Muslim	14826(44.4)	832(16.9)		
Traditional/Others	481(1.4)	444(9.0)		
Wealth Index				
Poorest	6194(18.6)	1089(22.2)	20.124	0.000
Poorer	6234(18.7)	921(18.7)		
Middle	6341(19.0)	897(18.2)		
Richer	6938(20.8)	1024(20.8)		
Richest	7678(23.0)	985(20.0)		
Source of Drinking				
Piped water	3491(10.5)	1925(39.2)	3594.243	0.000
Protected well	14068(42.1)	1904(38.7)		
Unprotected well	15403(46.1)	1022(20.8)		
Occupation				
Not Working	12464(37.3)	1108(22.5)	2161.899	0.000
Skilled	4679(14.0)	1891(38.5)		
Unskilled	16094(37.3)	1867(38.0)		

Over 80% of women in both countries did not use Contraceptive but higher in Nigeria (84.6%) than Ghana (81%). The analysis of age at first marriage of the respondent revealed that more than 50% married before age of 20 years in both countries, but Nigeria recorded a statistically higher proportion of first marriage at ages below 15 years (20%) than Ghanaians (6%).

It was also observed that about 60% of women in Nigeria compared to 55% in Ghana had their first sexual encounter before attaining the age of 19 years. And a quarter of Nigerian women compared to about 6% of Ghanaians did so before age 15 years.

There was a wide statistically significant gap in the proportion with high fertility in Nigeria (29%) compared to Ghana (1%). Indeed Ghana had a higher proportion of women with low fertility as measured by the total children ever born (chi square = 2062.169, $P < 0.0001$). It can be seen that close to half (40%) of the women in the Nigeria survey had a Low Fertility level while in Ghana majority of the respondents had Low Fertility (79.8%).

Table 4.2 Determinants of Fertility in Nigeria and Ghana DHS 2008

	Nigeria	Ghana		
	Frequency (%)	Frequency (%)	Chi square	P value
Variables	N=33385	N=4916		
Contraceptive Use				
No	28234(84.6)	3995(81.3)	110.132	0.000
Yes	5151(15.4)	921(18.7)		
Age at first Marriage				
<15	6685(20.0)	306(6.2)	554.884	0.000
15 – 19	10771(32.3)	1799(48.1)		
>19	7533(22.6)	1265(25.7)		
Age at First Intercourse				
<15	8185(24.5)	315(6.4)	930.896	0.000
15 – 19	11984(35.9)	2366(48.1)		
>19	13216(39.6)	1464(29.8)		
Total children ever born				
Low	13623(40.8)	3925(79.8)	2062.169	0.000
Medium	10047(30.1)	938(19.1)		
High	9714(29.1)	53(1.1)		

4.2 Socio-demographic factors Associated with Number of Children Ever Born in Nigeria and Ghana

In Tables 4.3 showed the distribution of the women according to their level of fertility and socio-demographic characteristics.

There were statistically significant association between Children Ever born and age of women, marital status, education, residence, religion, wealth index, occupation and source of drinking water ($P < 0.05$).

The level of parity increased as Nigerian women advanced in age. This observation is significant at $p < 0.05$, but the pattern of association between total children ever born and age by Ghanaian women were consistent.

From Table 4.3, the proportion of women living in the urban areas with low CEB 49% in Nigeria was higher than those living in rural areas (37%). Also Ghanaian women living in the urban area with low CEB (88%) was higher than those in the rural area 73%. But in general the CEB was much higher in Ghana than Nigeria. Also, respondents in Nigeria with secondary education had low CEB (62%) compared to those with no formal education 22%. In Ghana the proportion of women with secondary education that had low CEB (91%) was higher compared to those with no formal education (58%).

From Table 4.3, revealed the wealth index was associated with parity. It was observed that women with very low economic status (poor 39%, poorer 38%) had high CEB compared to those who were moderately rich or the richest.

The proportions of women not working in Nigeria 61% were lower than that of 95% recorded in Ghana. The Nigerian women also had a higher proportion of skilled workers (36%) than their Ghanaian counterparts 29% as shown in Table 4.3. This association is significantly at $p < 0.05$.

Table 4.3 Analysis of Total CEB with the Socio demographic characteristics of NDHS and GDHS survey of the respondent

	Variables	Nigeria						Ghana					
		N	Low(%)	Medium	High	χ^2	P-value	N	Low	Medium	High	χ^2	P-value
Age Group	15 – 24	12627	79.9	19.3	0.8	17148.86	0.0001	1906	99.7	0.3	0	1434.32	0.0001
	25 – 39	14855	21.5	43.1	35.3			2090	79.2	20.6	0.2		
	>39	5903	5.7	20.3	74.0			920	40.0	54.7	5.3		
Married status	Never	8396	98.5	1.3	0.2	15486.88	0.0001	1546	99.9	0.1	0	567.58	0.0001
	Currently	23578	21.6	39.8	38.6			2950	70.3	28.1	1.6		
	Formerly	1409	18.6	39.5	41.4			420	72.9	26.0	1.2		
Residence	Urban	11934	48.5	30.3	21.2	672.97	0.0001	2162	88.1	11.3	0.6	164.30	0.0001
	Rural	21450	36.5	30.0	33.5			2754	73.3	25.2	1.5		
Education	No Formal	11942	21.7	33.1	45.2	6026.54	0.0001	1243	57.7	39.7	2.7	598.21	0.0001
	Primary	6565	26.9	34.2	38.9			999	77.2	21.4	1.4		
	Secondary	14877	62.3	25.9	11.8			2670	91.1	8.7	0.2		
Religion	Christian	17908	49.7	27.9	22.5	1393.73	0.0001	3620	83.0	16.3	0.7	138.11	0.0001
	Muslim	14825	30.7	32.7	36.6			832	76.8	21.5	1.7		
	Traditional	481	24.5	33.1	42.4			444	60.1	37.3	2.7		
Wealth Index	Poorest	6194	28.9	31.8	39.3	1784.47	0.0001	1089	66.8	31.1	2.1	272.34	0.0001
	Poorer	6234	30.8	31.0	38.2			921	73.2	18.4	1.2		
	Middle	6659	39.1	28.3	32.6			897	80.4	18.4	1.2		
	Richer	6939	48.9	27.3	23.8			1024	87.6	11.8	0.6		
	Richest	7679	52.7	31.9	15.4			985	92.0	7.8	0.2		
Source of Drinking	Piped water	3490	44.3	31.5	24.2	284.14	0.0001	1925	86.2	13.1	0.6	103.75	0.0001
	Protected well	14068	43.9	29.9	26.2			1904	73.7	24.5	1.8		
	Unprotected	15402	36.4	30.2	33.4			1022	78.7	20.9	0.4		
Occupation	Not Working	12464	60.9	22.0	17.0	3762.87	0.0001	1108	95.4	4.5	0.1	317.30	0.0001
	Skilled	4678	38.4	35.7	25.9			1891	68.7	29.3	2.0		
	Unskilled	16094	26.0	34.7	39.4			1867	81.6	17.6	0.8		

In Ghana the proportion of women not using contraceptive with low CEB 81% were higher than their counterpart 41% (Nigeria).

There is a significant association between children ever born and age at first marriage. Nigeria recorded a statistically lower proportion of first marriage at age below 15 years (53%) than Ghanaian women 80%.

Table 4.4, the proportion of Ghanaian women had their sexual debut before the age 15 years 72% compared to Nigerian women 67%. This association is statistically significant at $p < 0.05$.

In both countries the use of oral contraceptives, marriage before the age of 19 years and early sexual intercourse facilitated high fertility.

Table 4.4 Determinants of Fertility among Nigerian and Ghanaian women

		Nigeria					Ghana					
Variables	**N**	**Low**	**Medium**	**High**	**χ^2**	**P- value**	**N**	**Low**	**Mediu**	**High**	**χ^2**	**P- value**
Contraceptive Use												
No	**28233**	**41.2**	**29.2**	**29.6**	**67.99**	**0.0001**	**3995**	**80.8**	**18.0**	**1.2**	**17.15**	**0.0001**
Yes	**5151**	**38.9**	**34.8**	**26.3**			**921**	**75.9**	**23.6**	**0.5**		
Age at First Marriage												
<15	**6684**	**14.3**	**32.7**	**53.0**	**1188.41**	**0.0001**	**306**	**57.2**	**40.2**	**2.6**	**104.21**	**0.0001**
15 – 19	**10770**	**21.4**	**39.0**	**39.6**			**1799**	**66.0**	**32.4**	**1.6**		
>19	**7533**	**27.7**	**47.1**	**25.2**			**1265**	**80.4**	**18.3**	**1.3**		
Age at First Intercourse												
<15	**8185**	**67.5**	**12.7**	**19.8**	**3468.88**	**0.0001**	**315**	**72.4**	**26.3**	**1.3**	**12.47**	**0.0001**
15 – 19	**11984**	**36.2**	**34.2**	**29.7**			**2366**	**78.1**	**20.7**	**1.3**		
>19	**13217**	**28.5**	**37.2**	**34.4**			**1464**	**73.7**	**25.0**	**1.3**		

4.3 Multinomial logistic regression of the women fertility Levels on Selected Independent Variables in Ghana and Nigeria

Table 4.5 shows the results for the multinomial logistic regression analysis performed on the data. The odds of medium fertility is low among Ghanaian women aged 25 – 39 years compared to those aged 39 years and above (OR = 0.15, 95% CI = 0.12 – 0.18).

Respondents who were currently married were 1.7 times more likely to report having medium fertility against low fertility as compared to the formerly married (OR = 1.66, 95% CI = 1.23-2.23).

In this study it was learned that the educational status of women had an overall significant effect on the number of children that women would have in their life time (P=0.000). Respondents were 3 times more likely to have medium fertility against low fertility as compared to no formal education against those with secondary education (OR = 3.06, 95% CI = 2.29-4.09).

Women living in urban areas were 19% less likely to have medium fertility against low fertility as compared to those living in rural areas (OR= 0.81, 95% CI = 0.60 – 1.09). Christian respondents were 11% less likely to have medium fertility against low fertility level as compared to those who practiced other forms of religion (OR= 0.89, 95% CI = 0.64 – 1.24). This association is not statistically significant at $p < 0.0001$.

Furthermore, the odds of medium fertility against low level fertility is much higher among the skilled worker compared to an unskilled worker (OR=1.23, 95% CI = 0.98 – 1.56). This is not statistically significant at $p < 0.0001$.

In Nigeria, those in the age group 25 – 39 years tend to have lower medium fertility against low level compared to those aged 39 years and above (OR = 0.74, 95% CI = 0.64-0.85).

Also, respondents with primary education are 1.5 times more likely to have a medium fertility among the women in low fertility level compared to those secondary education (Or = 1.52. 95% CI = 1.35 – 1.71). The odds of medium fertility against low fertility were also much higher among women currently married compared to those formerly married.

Furthermore, the location was not associated with medium fertility level against low fertility. Urban dwellers were 1.06 times more likely to report having medium fertility against low level fertility compared to women in the rural area (OR = 1.06, 95% CI = 0.96-1.17).

Table 4.5 Independent predictors of Medium fertility in Ghana and Nigeria

PREDICTOR	Ghana			Nigeria		
Medium	B	OR(95%CI)	p-value	B	OR(95%CI)	p-value
Intercept	-0.64		0.37	1.08		0.00
AGE						
15 – 24	-6.14	0.002(0.0-0.01)	0.00	-2.37	0.01(0.01-0.11)	0.00
25 – 39	-1.92	0.15(0.12-0.18)	0.00	-0.31	0.74(0.64-0.85)	0.00
>39	ref					
Marital Status						
Currently Married	0.51	1.66(1.23-2.23)	0.00	0.32	1.38(1.16-1.64)	0.00
Formerly Married	ref					
Religion						
Christianity	-0.11	0.89(0.64-1.24)	0.50	0.16	1.18(0.85-1.63)	0.32
Muslim	0.11	1.12(0.73-1.72)	0.60	0.10	1.10(0.80-1.52)	0.56
Traditional	ref					
Education						
No formal	1.12	3.06(2.29-4.09)	0.00	0.28	1.33(1.16-1.52)	0.00
Primary	0.76	2.13(1.62-2.80)	0.00	0.42	1.52(1.35-1.71)	0.00
Secondary	ref					
Residence						
Urban	-0.21	0.81(0.6-1.09)	0.16	0.06	1.06(0.96-1.17)	0.28
Rural	ref					
Occupation						
Not working	0.04	1.04(0.68-1.60)	0.85	-0.42	1.04(0.68-1.60)	0.85
Skilled worker	0.21	1.23(0.98-1.56)	0.08	-0.25	1.23(0.96-1.56)	0.08
Unskilled worker	ref					

*this parameter is set to zero because it is redundant.

From Table 4.6, Nigerian women aged 25 – 39 years are 86% less likely to report having high fertility against low fertility than those who are 39 years and above (OR=0.14, 95% CI = 0.12-0.16). Also, respondents who were currently married were 2.49 times more likely to have high fertility level compared with low fertility than those who were not in a union (OR = 2.49, 95% CI = 2.04-3.04)

Furthermore, the odds of high fertility against low level fertility is lower among Nigerian women living in urban areas compared to those that reside in the rural areas (OR = 0.94, 95% CI= 0.83-1.06). Muslims were 1.15times more likely to have high fertility compared with low fertility against those who practiced other forms of religion (OR= 1.15, 95% CI = 0.79-1.67). But this is not statistically significant.

Also, the odds of high fertility are 2.6 times higher among respondents with primary education compared to those with secondary education (OR = 2.64, 95% CI = 2.30-3.04). Respondents with no formal education are 2.1 times more likely to have high fertility level against low fertility level compared to those with the secondary education (OR = 2.06, 95% CI = 1.75-2.42).

Skilled workers were 1.9 times more likely to have a high fertility against low fertility compared to those who were unskilled (OR = 1.86, 95% CI = 0.79 - 4.41).

In Ghana, respondents who were currently married were 3.8 times more likely to report having high fertility against low level fertility as compared to the former married (OR = 3.81, 95% CI = 1.21 – 11.99).

Also, respondents with primary education are 7 times more likely to have a high fertility among women in low fertility compared to those secondary education (OR = 7.10, 95% CI = 2.42 – 20.83). Women living in urban areas were 6% less likely to have high fertility against low fertility as compared to those living in the rural areas.

Table 4.6 Independent predictors of High Fertility in Ghana and Nigeria

PREDICTOR	Ghana			Nigeria		
High	B	OR(95%CI)	p-value	B	OR(95%CI)	p-value
Intercept	-25.43		0.000	0.93		0.000
AGE						
15 – 24	-19.96	2.136E-009(0.0)	0.986	-7.55	0.00(0.00)	0.000
25 – 39	-4.62	0.01(0.0-0.03)	0.000	-1.99	0.14(0.12-0.16)	0.000
>39	ref					
Marital Status						
Currently Married	1.34	3.81(1.21-11.99)	0.022	0.91	2.49(2.04-3.04)	0.000
Formerly Married	ref					
Religion						
Christianity	-0.71	0.49(0.19-1.27)	0.143	0.08	1.08(0.75-1.56)	0.667
Muslim	0.24	1.28(0.43-3.80)	0.662	0.14	1.15(0.79-1.67)	0.458
Traditional	ref					
Education						
No formal	1.87	6.50(2.14-19.78)	0.001	0.72	2.06(1.75-2.42)	0.000
Primary	1.96	7.10(2.42-20.83)	0.000	0.97	2.64(2.30-3.04)	0.000
Secondary	ref					
Residence						
Urban	-0.04	0.94(0.33-2.78)	0.939	-0.07	0.94(0.83-1.06)	0.286
Rural	ref					
Occupation						
Not working	-0.73	0.48(0.06-4.19)	0.507	-0.77	0.47(0.42-0.52)	0.000
Skilled worker	0.62	1.86(0.79-4.41)	0.157	-0.45	0.64(0.56-0.73)	0.000
Unskilled worker	ref					

*this parameter is set to zero because it is redundant.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.0 DISCUSSION

5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

This study investigated the effect of the basic socio demographic factors on fertility levels in Nigeria and Ghana using the data from DHS 2008. The findings from this study shows the mean reproductive age of women in Nigeria was 28.65±9.49years and Ghana was 29±9.70years. While the prevalence of level of fertility in Nigeria 71% of the respondents were currently married higher than 60% recorded in Ghana, also about 40% had secondary education compared to about a quarter in Ghana. The proportion of women not working in Nigeria 37% was higher than the 22% recorded for Ghana. Over 80% of women in both countries did not use contraceptive but higher in Nigeria 84.6% than Ghana 81%. The most common age group at first marriage revealed more than 50% married below the age of 20years in both countries.

Also the multinomial logistic regression analysis showed women aged 25-39years were more higher than those in adult age in the women fertility levels of Low CEB (p=0.000, OR= 0.147, 95% CI = 0.982), current married respondents were 1.7times more likely to have a low CEB fertility differential than formerly married (p=0.001, OR = 1.657, 95% CI = 1.230 - 2.232).

The overall mean age of women at their first marriage found in this study was 18 ±4.58years and 19±4.16years for Nigeria and Ghana respectively. This is an indication of high fertility rate in these two countries and this finding is consistent with the findings of Alene and Worku (2008) in Northwest Ethiopia with high fertility rate of women who married before aged 15years. That is why countries like France whose mean age at marriage is around 30years have a total fertility of about 1 or 2 (INSEE, 2010) compared with 5.38 and 3.39 in Nigeria and Ghana.

The present study also showed that rural women have higher fertility than urban women. The odds of high fertility is 6% lower among urban residents in both countries which is similar to the findings of Alene and Worku (2008) and Ramesh Adhikari (2010) where rural dwellers were more likely to have high fertility as compared to those living in urban areas and these is

also consistent with findings of other researchers in the 1990s (Lee and Louis, 1993, Muhuri et al, 1994 and Mboup and Tulshi, 1998). One reason could be that urban women are more likely to use contraceptives than are rural women or women who live in rural areas tend to marry at a younger age than those in urban areas (Sisouphanthong et al, 2000, Retherford and Thapa, 2003).

In this study, it was observed that education attainment had significant effect on number of children that women would have in their life time ($p<0.001$). Education exposes women to information, empowers women, makes them more likely to be employed outside their home environment, and makes them more aware of their own health and the health of their children-all of which are negatively associated with the number of children a woman will have during her reproductive life. This study showed that women with primary education have higher fertility compared to those with no formal education in both countries but from other studies, it was found that educated women are more likely to postpone marriage, have smaller family size, and use contraception than are uneducated women as found in Martin, (1995) and Ramesh Adhikari (2010).

It was found out that women presently in union as of the time of the survey are more likely to be under the risk of high fertility compared to those women who were not in unions which is consistent with previous study carried out by Alene and Worku in 2008. This might be as a result from the use of family planning.

Less than half of the females had their first sexual encounter before the age of fifteen; even more alarming is the fact that some of them began having intercourse at early age. In Ghana the proportion of women not using contraceptive with low CEB were higher than their counterparts in Nigeria.

An decrease in the average age at first marriage has an adverse effect on high fertility those women who get married at early age will be exposed to an early sexual intercourse which in turn leads to too many teen age pregnancies. Apart from the negative impact it poses on women's health, this culture of early marriage has a greater likelihood of having a lot of children eventually. Similar findings were documented in a number other studies (Fitaw and Worku, 2003, Serbessa, 2003)

5.2 LIMITATION

Despite relatively increased educational investments, large urban population and government support for family planning, it appears Nigeria and Ghana experienced no significant decline in fertility during the 2000s in the DHS reports of West African Countries (Akpotu, 2008; Bongaart, 2006).

There are some limitations with regard to interpreting the results of this study. Due to the cross sectional design of the study and all the variables analyzed in the regression model, it can only provide evidence of a statistical association between those variables and children ever born and cannot show a cause-effect relationship. The other limitation of the study is, as a measure of fertility, the number of CEB suffers from problems of truncation and censoring as it includes the number of children born up to specific points in women's childbearing years. We should not forget other important errors that could exist in the collection of information regarding the number of children ever born (CEB).

5.3 CONCLUSION/ RECOMMENDATION

The main objective of this study was to assess the effect of basic socio-demographic factors on fertility levels in Nigeria and Ghana. Many factors contribute to this phenomenon. Among these factors, marital status, Education, Place of Residence, age at first marriage are important and strong predictors that affect fertility.

This study revealed that women education beyond the primary level reduced fertility level. In particular, the enhancement of female education beyond the primary level is the most important agent of change in women's access to power and control over resources as well as in demographic conditions. In this regards the efforts of the Nigerian and Ghanaian government should be directly at encouraging the women population and further steps that would enable the girl child to pursue their secondary and college education should be sought. Despite the legal restrictions against marrying at young age, early marriage is common in the two countries. Therefore, programs should focus on creating awareness of the marriage law and the disadvantages of early marriage. Similarly, more emphasis needs to be place on messages conveyed via the mass media, messages addressing the advantages of small family size and family planning should be promoted. Mass media can present a wider range of

knowledge and lead to adopting contraception. Furthermore, long-running programs focusing on increasing wealth status are essential to improve the reproductive health status of women. In order to effectively tackle the uncontrolled population growth and its associated problems in Ghana and Nigeria, there appears a need to investigate the contribution of a number of factors influencing fertility.

Programs that focus on reduction of infant and child mortality could also be considered, which would also help to reduce fertility. In short, it can be concluded that programs should aim to reduce fertility by focusing on all these identified predictors so that fertility as well as infant and maternal mortality and morbidity can be decreased and the overall wellbeing of the family maintained and enhanced.

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Appendix 1

s/n	Variable name	Identification in data set	Variable type	Classification for study
1	Current age of respondent	V012	Numeric	Socio demographic
2	Age 5-year age groups	V013	Categorical	Socio demographic
3	Type of place of residence	V102	Categorical	Socio demographic
4	Highest educational level	V106	Categorical	Socio economic
5	Religion of respondent	V130	Categorical	Socio demographic
6	Total children ever born	V201	Numeric	Fertility Determinant
7	Current marital status	V501	Categorical	Socio demographic
8	Age at first marriage	V511	Numeric	Fertility Determinant
9	Age at first intercourse	V525	Numeric	Fertility Determinant
10	Respondents occupation	V717	Categorical	Socio economic
11	Wealth index	V190	Categorical	Socio economic
12	Contraceptive Use	V312	Categorical	Fertility Determinant
13	Source of drinking water	V113	Categorical	Socio economic
14	Currently/formerly/never married	V502	Categorical	Socio demographic

Appendix 2

Variable	Description
V012	Current age: 15-24, 25-39. >39
V102	Type of Residence: Urban and Rural
V106	Educational level: No formal, Primary, Secondary
V113	Source of drinking water: Piped water, Protected well/spring, Unprotected well/spring
V130	Religion: Christianity, Muslim/Islam, traditional and others
V190	Wealth Index: Poorest, Poorer, Medium, Richer, Richest
V201	Total Children Ever Born: Low, Medium, High
V312	Contraceptive Use: No, Yes
V502	Marital Status: Currently/formerly/Never married
V511	Age at First Marriage: < 15, 15 – 19, > 19
V525	Age at First Intercourse: < 15, 15 – 19, > 19
V717	Respondent's Occupation: Not Working, skilled, unskilled and others