CHILDBEARING PROGRESSION AND CORRELATES OF CONTRACEPTIVE USE AMONG WOMEN OF REPRODUCTIVE AGE IN NORTHERN NIGERIA

BY

Mariah Abiola OBASHOLA
B.Sc GEOGRAPHY AND PLANNING (JOS)
MATRIC NO: 148100

A DISSERTATION IN THE DEPARTMENT OF EPIDEMIOLOGY AND MEDICAL STATISTICS, SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, COLLEGE OF MEDICINE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH (MEDICAL DEMOGRAPHY) OF THE UNIVERSITY OF IBADAN

SEPTEMBER, 2014

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DEDICATION

This work is dedicated to all women who participated in this study.

ACKNOWLEDGEMENT

I give all glory to God almighty for His grace to go through this programme and particularly to carry out this project.

I really appreciate my lovely husband, Dr. Lucius Chidiebere Imoh who has given me all the support to ensure the successful completion of this programme. I appreciate my daughters, Godsdelight and Goodnews for bearing with me and excusing the many times of reduced attention while at work for this project.

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ABSTRACT

The rate at which population is growing relative to GDP growth in Nigeria is a source of concern. High Childbearing Progression (CP) and low level of contraceptive use are major challenges in this regard, particularly in the northern region. Therefore, women in this region are characterised by poor child spacing and high fertility, which are inimical to maternal and child health. This study was designed to assess CP and correlates of contraceptive use among women of reproductive age in northern Nigeria.

The study utilised data from the Nigeria Demographic and Health Survey (NDHS) 2008. The NDHS is a national representative survey of 33,385 women age 15-49 years. Data were extracted from the complete dataset with focus on 14,081 women resident in the north (north east, north west, north central), who had ever had sexual intercourse with men. The CP was assessed among women at the end of the reproductive age (45-49 years) and have had at least a child. Variables used in the study included: ever-use and current-use (4 weeks preceding the survey) of contraceptive, age, educational level, employment status, place of residence, wealth index and parity. The dataset was weighted and analysed using descriptive statistics, Chi-square test and logistic regression. Kaplan Miere survival function was used to assess the CP rate. The level of significance was set at 5.0%.

Mean age of respondents was 29.9 ± 9.2 years. Overall, CP rate among never users of contraceptive was higher (-0.081) than that of ever users (-0.093). Prevalence of current and ever use of any contraceptive method were 12.3% and 13.3% and 11.7% and 12.1% for any modern contraceptive method respectively. Current and ever use of any contraceptive method was significantly lower among women with no formal education (5.6% and 6.0%) compared to those with tertiary education (58.9% and 56.1%). About 24.8% of women resident in urban areas significantly ever used a contraceptive method as against 10.0% in the rural. The percentage of women who had ever used any contraceptive method increased significantly from 6.3% among the poorest to 39.9% among the richest. Women in the richest wealth index category were more likely to have ever used contraceptive than the poorest (OR=2.52; CI=1.97-3.22). The odds of ever using contraceptive was higher among women with tertiary education than those with no formal education (OR=4.66; CI=3.4-6.4). Also, women in paid employment were more

likely to have ever used contraceptives than those who were not (OR=1.44; CI=1.3-1.7). A similar pattern of odds of ever use of contraceptive was observed for current use with respect to wealth index, level of education and employment status.

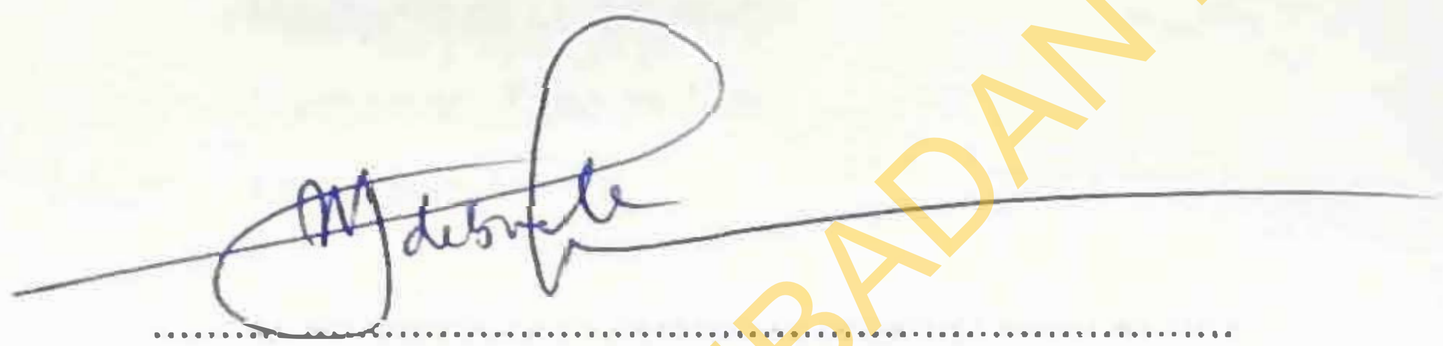
Use of contraceptives was associated with lower Childbearing progression rate. Wealth index, level of education and employment status were the major correlates of contraceptive use. Campaigns on contraceptive usage in northern Nigeria should be increased and target the poor and less educated women who are not in paid employment.

Keywords: Contraceptive use, Childbearing Progression, Women of Reproductive Age.

Word count: 482

CERTIFICATION

I certify that this research was carried out under my supervision by OBASHOLA Mariah Abiola, in the department of Epidemiology and Medical Statistics, Faculty of Public Health, University of Ibadan.



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SUPERVISOR

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ABBREVIATIONS/GLOSSARY/DEFINITIONS

ICPD	-	INTERNATIONAL CONFERENCE ON POPULATION AND DEVELOPMENT
UNFPA	-	(UNITED NATION FUNDS FOR POPULATION ACTIVITIES
TFR	-	TOTAL FERTILITY RATE
NDHS	-	NIGERIA DEMOGRAPHIC AND HEALTH SURVEY
MDG	-	MILLENIUM DEVELOPMENT GOAL
USAID	-	UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT IN NIGERIA
PPP	-	PARITY PROGRESSION PROBABILITY
PPR	-	PARITY PROGRESSION RATE
HIV	-	HUMAN IMMUNE VIRUS
AIDS	-	ACQUIRED IMMUNO DEFICIECY SYNDROME
NPC	-	NATIONAL POPULATION COMMISION
PEPFAR	-	PRESIDENT'S EMERGENCY PLAN FOR AIDS RELIEF
DHS	-	DEMOGRAPHIC AND HEALTH SURVEY
PSU	-	PRIMARY SAMPLING UNIT
EA	-	ENUMERATION AREA
SPSS	-	STAISTICAL PACKAGE FOR SOCIAL SCIENCES
OR	-	ODDS RATIO
CI	-	CONFIDENCE INTERVAL
SD	-	STANDARD DEVIATION

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

World's population in 2011, hit 7 billion and may further increase at high rate if unchecked (UNFPA, 2011; Population Reference Bureau, 2012). Controlling the world's population has been a source of concern to international agencies and demographers. particularly those in developing countries. Nigeria with an estimated population of 167 million (National population commission, 2011) is the largest country in Africa and is credited with a low contraceptive use prevalence (15%, all methods) and even a lower prevalence (10%) for modern contraceptive use (NDHS, 2008). The knowledge of contraceptives is said to be on the rise in many parts of the world, but this is yet to translate to an expected increase in its use (Wambui and Alehagen, 2009).

Access to safe and effective methods of contraception has been considered a basic human right in many national and international conferences. At the 1994 International Conference on Population and Development (ICPD), several countries around the world agreed to working towards improving utilization of effective contraception (ICPD, 1994). This has tremendously contributed to a reduction in the burden of reproductive ill health by decreasing mortality and morbidity caused by unwanted pregnancies (Collumbien, Gerressu and Cleland 2004, Marston and Cleland, 2004). Increasing contraceptive use has been known as a factor to reckon with as far as fertility reduction and population control are concerned (Gakidou, 2007). Contraceptive use also has influence on the pace at which childbearing occurs by giving women the opportunity to space their children (Adebowale, Adepoju and Fagbamigbe, 2011(a)).

The effectiveness of contraceptive use in a population can be assessed through its impact on fertility behaviour. Consequently, the impact of contraceptive use on a community can be studied using the measures of fertility. Prominent among these measures are Total Fertility Rate (TFR) and parity progression. The TFR has the tendency to distinguish the

level of fertility among users and non users of modern contraceptives (Makinwa-Adebusoye and Feyisetan, 1994). Prominent among these measures are Total Fertility Rate (TFR) and parity progression. The TFR has the tendency to distinguish the level of fertility among users and non users of modern contraceptives (Makinwa-Adebusoye and Feyisetan, 1994). Parity progression has also been previously used to assess the impact of contraceptive use as found in Adebowale and Akinyemi's study in a community in Nigeria (Adebowale and Akinyemi, 2011) but unlike the TFR the Parity progression takes into consideration the fertility changes among different cohorts of women throughout the childbearing period. Parity progression assesses how women proceed from one parity to the next higher parity. The parity progression as an index of level of fertility of a population has implication on maternal and child health (Love, Bhattacharya and Smith, 2010, Feneey, 1991).

Since contraceptive use affects fertility behavior as expressed in TFR and parity progression, it is therefore important to explore the correlates of contraceptive use in Nigeria particularly in the Northern part of the country where the contraceptive use prevalence is lower than the southern region (NDHS, 2003; NDHS, 2008). The factors influencing contraceptive use in the Northern part of Nigeria will help to explain the reasons for low contraceptive use in that part of the country.

Factors such as religion, culture, ethnicity, education and occupation as predictors of contraceptive use, is vastly documented in previous studies (Odimegwu, Ojo and Siyagande. 1997; Ngalinda, 2002, Oyedokun, 2007; Okech, Wawire and Mburu, 2011). Other factors such as family planning approval, exposure to media and place of residence have been identified as influencing contraceptive use and childbearing progression (Odimegwu et al, 1997; Bairagi, 2001). The magnitude and direction of influence of these determinants of contraceptive use and childbearing differ across populations. It will be helpful to establish the role of contraceptive and its determinants on how childbearing progresses in northern Nigerian population where the contraceptive use prevalence is low. Little attention has been paid to this in northern Nigeria, hence the need for this study. Thus, this study was conceived with the view to contributing to the existing studies on patterns of contraceptive use across the three regions in Northern Nigeria.

1.2 STATEMENT OF THE PROBLEM

Over the years, Nigeria has developed several policies on population and development which aim among other things at lowering population growth rate. For instance, national policy on population for development, unity, progress and self-reliance was formulated in 1988 and revised in 2004 (National population commission, 2007). A major goal of the policy is a reduction in fertility through increase adoption of contraception (National population commission, 2007). The national surveys previously conducted in Nigeria show that Nigeria has not achieved much towards actualizing this goal as TFR has remained high and unchanged (5.7) (NDHS, 2003; NDHS, 2008) and the figure is higher than the estimate for sub-Saharan Africa (5.1) (Goliber, Sanders and Ross, 2009; Population Reference Bureau, 2012).

The annual population growth rate of 2.5% in Nigeria has been a major source of concern to policy makers and demographers (Oyedokun, 2007). Further analysis of the Nigerian situation has revealed that northern region of Nigeria appear to be lagging behind in a number of social, demographic, health and economic indices and the low contraceptive use in this region may be partly responsible for this situation (NDHS 2008). For example, across the country, current use of contraceptive is lowest in the North West region (3 percent) and highest in the South West region (32 percent) (NDHS 2008).

With the present mean children-ever-born estimated for some regions in northern Nigeria, one may be tempted to argue that increased tendency to progress to higher parities, closely spaced and ill-timed pregnancies are imminent and this situation can classify northern region among the regions with the world's highest maternal and infant mortality rates (Population Reference Bureau, 2012). Millennium Development Goal (MDG) 4 and 5- to reduce child mortality and improve maternal health will be a hallucination without addressing these reproductive health challenges peculiar to northern Nigeria.

Many issues concerning family planning practices in northern Nigeria still await rigorous examination particularly, using a national representative data as found in this study. Existing researches on childbearing dynamics in northern Nigeria are rather limited. This study was therefore designed to contribute to the understanding of fertility dynamics in northern Nigeria.

1.3 JUSTIFICATION

This study targets themes 4 and 5 of the Millennium Development Goals which aims to reduce infant mortality and improve maternal health (United Nations, 2014) The importance of family planning to the health of mother and child is aptly captured by the fact that it is one of the indicators for the universal access to reproductive health of the millennium development goal number 5 (Ross and Stover, 2010). The important role of modern contraceptive use in achieving the MDG has been acknowledged (USAID, 2011). Although, socio-demographic factors are known to affect contraceptive use, the magnitude of their influence in the northern parts of Nigeria is yet to be fully explored.

In northern Nigeria, early age at marriage for women and early initiation of sexual activity leads to early exposure to childbearing thus, the childbearing interval may be unnecessarily too short (Monjok, Smesny, Ekabua and Essien, 2010). This has contributed significantly to the high fertility and subsequent higher prevalence of maternal and fetal complications (NDHS, 2003; Babalola, Folda and Babayaro, 2008). Findings from a study on family planning practices in northern Nigeria, suggests that there is low knowledge of contraceptives and a generally negative attitude towards limiting family size (Duze and Mohammed, 2006). Understanding the factors that influence contraceptive use is therefore critical to the efforts of programmes to increase its prevalence (Oyedokun, 2007).

Understanding the underlying factors influencing contraceptive use in northern Nigeria will therefore be instructive for policy and programme managers in bridging the gap between knowledge and the practice of contraception. In addition, the impact of modern contraceptive on fertility in northern Nigeria still awaits a careful examination. Literature on the relationship between contraceptive use and childbearing progression are scarce worldwide, and northern Nigeria is not an exemption. This study therefore was designed to fill the gap. Investigation into the level of contraceptive use and its influence on fertility in northern Nigeria are necessary to initiate action by government and international agencies.

1.4 RESEARCH QUESTIONS

1. What is the prevalence of contraceptive use ("ever use" and "current use") in northern Nigeria?
2. What are the socio-demographic factors influencing the use of contraception among women of reproductive age in northern Nigerian?
3. Is there a difference between adjusted TFR for 'ever used' and 'never used' of contraceptive among women in northern Nigeria?
4. Does the childbearing progression rates differ between women who ever and those never used contraception in northern Nigeria?

1.5 OBJECTIVE OF THE STUDY

The main objective of this study is to examine the correlates of contraceptive use and determine the influence of contraceptive use on childbearing progression rate and TFR among women of reproductive age in northern Nigeria.

The specific objectives of the study are to:

1. Estimate the prevalence of contraceptive use ("ever use" and "current use") in northern Nigeria.
2. Identify socio-demographic factors influencing the use ("ever use" and "current use") of contraceptive among women of reproductive age in northern Nigeria.
3. Compare the adjusted TFR of women who 'ever used' and 'never used' contraceptive in northern Nigeria.
4. Examine the differential in childbearing progression between women who 'ever used' and 'never used' contraceptive in northern Nigeria.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONTRACEPTION AND HISTORICAL PERSPECTIVE

Contraception, also known as birth control measure means intentional prevention of pregnancy while contraceptive is any device used to prevent pregnancy. The use of contraceptives is not new in itself. Although, there have been several advances in the contraceptive methods, historical descriptions of the practice of crude contraception exists. The methods adopted in the ancient times were characterized by several myths, unscientific and less efficient in preventing pregnancies compared to the more modern methods (Grady-Klepinger, and Nelson-Wally, 1999; Esprey, Ogburn, Howard, Qualls and Ogburn, 2008).

Among the earliest forms of contraception is coitus interruptus also known as withdrawal as mentioned in the Bible (Genesis 38:9) and reported by anthropologists (Tietze, 1965). It was practiced in Africa, Australia, the Middle East, and in Europe. Though, condemned by Judaism and Roman Catholicism, its practice was common in Medieval Europe but was frequently attacked in canonical writings as a "vice against nature" (Tietze, 1965). Before the Industrial Revolution, birth control devices relied largely on condoms for men, it was fashioned from linen or from animal intestines and douches made for and by women from common household ingredients (Denoon, 2001). Some of the earlier contraceptive methods are still being used in northern Nigeria as traditional and folkloric contraceptive methods (NDHS 2003, NDHS 2008). For instance, the use of traditional remedies include; the use of herbal concoctions and charms in the form of rings, waist band, wrist bands and bead, withdrawal and rhythm method (periodic abstinence) has been widely reported in northern Nigeria (NDHS, 2008; Obisesan et al, 1997). The effectiveness of these methods are questionable, this is why family planning experts do recommend the modern methods (Oye-Adeniran et al, 2006). Modern contraceptive methods acts by at least one of the following mechanism: preventing the sperm from reaching the ovum (barrier methods-condoms, diaphragms, tubal ligation); inhibiting ovulation (Hormonal methods- oral

contraceptive pills, injections, implants, intrauterine contraceptive devices, lactational amenorrhoea method), preventing implantation (intrauterine devices), killing the sperm (spermicides), and preventing the sperm from entering the seminal fluid (vasectomy) (The American College of Obstetricians and Gynecologists, 2010).

2.2 TRENDS IN CONTRACEPTIVE USE, CHILDBEARING PROGRESSION AND FERTILITY

The use of contraception (especially modern methods) has led to a marked fall in total fertility rates (TFRs) in the developed world and a modest fall in some less-developed countries (Garrene, 2008). In 2005, it was estimated that 60% of married women worldwide were using contraception (all methods) and 53% were using modern methods, resulting in a global TFR estimate of 2.7 (Glasier and Gebbie, 2008; Gakidou and Vayena, 2007). These impressive statistics hide enormous variation between countries, regions and even continents. In China for instance, 87% of married women use contraception (86%, modern methods) while in Chad only 11% are using contraception (2%, modern methods) (Glasier and Gebbie, 2008; Gakidou and Vayena, 2007).

The use or non-use of contraceptives in many parts of the world has been one of the determinants that have been put forward to explain the global trends in fertility behavior across regions and continents of the world (Goliber et al., 2009). The fertility behavior in regions of the world has been studied by many researchers by exploring the period fertility rates and parity progression characteristics among age group cohorts of women of reproductive age (15-49 years) (Fenney, 1991; Hans-peter and Ortega, 2002). Although, there is a general trend towards reduction in fertility rates in many countries of the world, the earliest decline was noticeable in the United States and many countries in Europe. Following the baby boom period in the 1930s, the fertility rates and parity progression for all cohorts of women at all levels of parity declined considerably (Glasier and Gebbie, 2008). The trend was followed 10-20 decades later by western European countries. The socialist European countries particularly the central and eastern Europe had a high and stable fertility until the 1960s (Glasier and Gebbie, 2008). The decline in parity progression was more robust in cohorts of women born in the 1960s (ending their childbearing in the 21st century). The

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fertility trend was also characterized by increasing tendency towards postponement of first birth. as well as universal increase in the mean age of women at first birth (Glasier and Gebbie, 2008). In England and Whales for instance, from the 1940s cohort a continuous postponement of childbearing occurred in all birth order and the proportion of women having progressively increasing order of parity declined (Glasier and Gebbie, 2008). This was more marked at higher order parity. It was noticed in the UK and other European countries that a tendency to two- children families was emerging and increase in childless women was noticed (Frejka and Sardon, 2006). The decline in fertility and progression to higher parity observed in the advanced countries may have coincided with the onset of improved modern contraceptive access and utilization.

According to the 1995-1999 DHS reports, several countries in the America/Caribbean regions, Asia, and Near/North Africa regions were also in advanced stages of fertility transition (Rutstein, 2002). The progression of parity from 1 to 2 is on the decline in countries like Indonesia, Kazakhstan, and Vietnam in Asia while in Turkey and the Near East/North Africa region, where the fertility transition is well advanced, the Parity Progression Rates from parity 1 to 2 is already low (71 percent or less). By contrast, the PPRs at higher parities are greater than 80 percent in Yemen, where the proportion progressing to parity 6 is 86 percent (Rutstein, 2002). The 1995-1999 DHS reports suggest this decline to be likely due to the combined effects of delay in the onset of reproduction and the use of contraception. However, in some countries like Bangladesh, the lowered PPRs and fertility level is due much more to use of contraception in birth limitation and spacing than to a delay in the entry into reproduction (Rutstein, 2002). The Latin America/Caribbean region had the greatest reduction in fertility due to contraception with Asia, Near East/North Africa region following (Rutstein, 2002). Furthermore, unlike in many western countries where the effect of induced abortion on parity progression and fertility is debatable, their effects in these regions were shown to be negligible (Rutstein, 2002), further underscoring the impact of contraception on the fertility decline.

2.3 CHILDBEARING PROGRESSION IN AFRICA

The fertility landscape in Africa portrays a mixed picture with ill-defined variations among and within countries. This may be attributed to great diversities in cultural, economic and political milieu. Sub-Sahara Africa however possesses social and cultural characteristics that distinguish it from other regions and has thus experienced some level of synchronization in socio-demographic transitions (Garrene, 2008). Many researchers agreed that some African countries at best are only in early stages of fertility transition (Mboup and Saha, 1998). The parity progression ratios, as well as the other fertility indices for many countries in Africa are reported to be on a decline but are still well above the world average (Moultrie and Timaeus, 2002). The progression to higher parities has been identified as an important factor undermining maternal and child survival which is a bane in many African societies (Rustein, 2002).

Parity Progression among African women shows that the decline experienced in recent times has not been characterized by parity-specific fertility limitation in order to conform to social norms relating to an 'optimal' number of children that woman should bear (Moultrie and Timaeus, 2002). This is different from the pattern observed in Europe where the parity progression tends towards the socially accepted two-child family (Moultrie and Timaeus, 2002).

The most convincing evidence of fertility decline has been demonstrated in some southern and eastern African countries. When the transition from parity 1 to 2 is examined, the lowest PPRs are observed in South Africa and Zimbabwe (48 percent and 69 percent, respectively). Parity Progression Ratio of 90 percent or higher are found in the high-fertility countries. Burkina Faso, Mali, Niger, Chad, and Uganda (Rustein, 2002). In most countries in sub-Saharan Africa, the probability of progression from parity 5 to 6 is fairly high, that is, greater than 70 percent. The countries with the highest PPRs for parity 5 to 6 are those with the highest PPRs for parity 1 to 2 and the highest levels of fertility (Burkina Faso, Mali, and Niger) (Rustein, 2002). The percentage of women who reach parity 6 among women who have had at least one birth varied from 1 percent in South Africa and 6 percent in Zimbabwe to 63 percent in Niger. A review of fertility changes in the 1980s using data from several fertility surveys suggested that the parity progression ratios for older cohorts of 40-49 years

were markedly lower than those of younger age cohorts (30-39 years) in Kenya, Zimbabwe and Botswana (Cleland et al. 1994). In Swaziland and Senegal and Sudan (North), modest fertility decline was noticed among women aged 20-39 years, whereas in countries like Ethiopia, Uganda, Burundi, Mali, Liberia, Ghana and Togo, no evidential fall in fertility was observed (Cleland et al. 1994). The parity progression characteristics in South Africa however differ from that of other African countries having experienced decline in fertility occurring at all ages and parities simultaneously and the birth intervals in South Africa were substantially longer than in those of most other sub-Saharan African countries (Rutstein, 2002). For instance, median birth intervals across the sub-Saharan Africa ranged from 28 months in Madagascar and Uganda to 39 months in Zimbabwe, whereas the equivalent median interval for the same subpopulation is 59 months. Similarly, parity progression and birth intervals in South Africa are such that African South Africans progressing to a subsequent parity within five years of the last birth are much lower than those observed elsewhere in the developing world, even in countries with similar levels of fertility (Moultrie and Timaeus, 2002; Chakraborty, 2012).

2.4 CHILDBEARING PROGRESSION IN NIGERIA

There is a paucity of data concerning parity progression in Nigeria particularly in northern Nigeria. The few evidences in Nigeria show that probability of progressing from lower parity to the next higher parity is associated with poor health like high under five mortality rate and maternal under-nutrition in south west Nigeria (Adebowale et al , 2011(a); Adebowale et al, 2011(b)). A review of PPRs and fertility trends in Nigeria in the 1980s seems to suggest a trend towards a modest decline as has been observed in many sub-Saharan countries and this change was restricted to south east and south west regions of Nigeria with Northern Nigeria experiencing little or no change (Cleland J et al., 1994). A similar North to South pattern was observed in the 2008 national survey (NDHS, 2008). Also, examination of the proportions of women having a child within five years of the previous birth showed that there is a high probability of moving from one birth order to another (NDHS, 2008). However, there was appreciable decrease in the proportion of women progressing from the 5^{th} birth to the sixth birth within five years of having the fifth when compared with the

transition from second to third birth or fourth to fifth birth (NDHS, 2008). In a more recent analysis, the parity progression probability was more marked between parity 0 to 4. Also a similar north-south dichotomy was observed as described above (Adebowale et al. 2011(a)).

2.5 DETERMINANTS OF CHILDBEARING PROGRESSION

The determinants of parity progression and birth interval are essentially those that determine fertility. Factors that have been indentified to explain differences in parity progression between populations include contraceptive use and effectiveness, proportion of women married, post partum infecundibility and prevalence of induced abortion (Frejka and Sardon 2006). It is suggested that the effects of other intermediate variables or factors such as educational level and urbanization may affect fertility by modulating these proximate factors (Frejka and Sardon 2006).

The effect of contraceptives on parity progression and other fertility variables is probably the most reported (Rutstein, 2002). In fact, the world wide decline in fertility over the past 4 decades have been driven primarily by increasing fertility regulation among married couples and this has been achieved largely by contraception (Frejka and Sardon. 2006).

In a study in south west Nigeria, it was shown that women with at least a secondary education were more likely to have lower PPPs than women with no education or primary education. Although living in an urban setting is expected to be associated with lower parity progression, the study did not show a significant association (Adebowale et al 2011(b)). These were similar to the findings in another study (Makinwa-Adebusoye and Feyisetan, 1994).

Studies show that sex composition of existing children is a factor in progressing to higher order births (Pollard and Morgan, 2002). The preference for sons in particular has been associated with a tendency to progress to higher birth orders particularly in more traditional societies. However in western countries, mixed sex composition was more influential in driving higher progression rates. Evidence indicates that parents with two children of the same sex are more likely to have a third child than parents who have a boy and a girl (Pebley and Westoff, 1982; Jacobsen et al, 1999).

In general, the PPRs are shown to be higher in the rural compared to the urban regions as revealed in previous studies. For example, in a global survey, the greatest urban-rural difference in PPR 1 to 6 occurred in sub-Saharan Africa (average difference of 23 percent). The smallest average difference between urban and rural occurred in Asia (8 percent), and the Near East/North Africa and Latin America/Caribbean regions fall in between (differences of 17 and 18 percent, respectively) (Rustein, 2002).

2.6 INTERACTION BETWEEN CONTRACEPTIVE USE AND CHILDBEARING PROGRESSION IN AFRICA

The modest decline in parity progression and fertility in many African countries parallel their level of use of contraceptives. Although, there are alternative explanations like rising age at marriage and first birth in some African societies, it does not appear that they are likely to have as much effect as contraceptive use among married couples which have been documented to have primarily fuelled the worldwide decline in fertility (Cleland et al, 1994).

The interaction effects of contraceptive use on parity progression as found in previous studies suggests that countries with higher contraceptive prevalence rates had lower fertility rates and PPRs, whereas countries with low contraceptive prevalence rates were more likely to have high fertility and PPRs (Moultrie and Timaeus, 2002). For instance, the notable low proportion of women progressing from parity 1 to 2 in South Africa and Zimbabwe has been shown to be related to the use of contraceptive methods for limiting or spacing births (Rutstein, 2002). The decline in South Africa was particularly driven by upsurge in contraceptive usage among the black population in South Africa (Moultrie and Timaeus 2002). Even the urban- rural difference in parity progression and birth interval observed in South Africa was attributed to be related to the more proximate determinant of contraceptive usage. It is anticipated that in countries like South Africa where the HIV/AIDS prevalence rate is high, the effects of the disease such as secondary sterility, fetal loss, as well as promotion of barrier contraceptives as HIV/AIDS control measures will impact on future fertility decline (Moultrie and Timaeus 2002).

2.7 INTERACTION BETWEEN CONTRACEPTIVE USE AND CHILDBEARING PROGRESSION IN NIGERIA

A recent study by Adebowale and colleagues showed that the parity progression rate for ever users of contraceptive was lower than for women who have never used contraceptive (Adebowale et al, 2011(a)). It was suggested that this may be due to increased tendency to control fertility with contraceptives. The contraceptive use rate supports this assertion. In the same study, it was observed that the parity progression ratio for ever users of contraceptives was lower than for nonusers. Also, contraceptive prevalence in the south east and south west of Nigeria was markedly higher than those of the north east and north west where PPRs and fertility has not shown appreciable decline (UNFPA Nigeria Country Office, 2010). Makinwa-Adebusoye and Feyisetan, 1994, showed that the use of contraceptives in controlling fertility and delaying child bearing reasonably explained the observed decline in proportions having a sixth birth within five years of having the fifth birth in Nigeria (Makinwa-Adebusoye and Feyisetan, 1994).

2.8 CONTRACEPTIVE USE IN NIGERIA

In Nigeria, contraceptive knowledge and awareness is very high. The NDHS (2008) report revealed that the contraceptive knowledge prevalence was 72%. Most studies have shown high contraceptive knowledge and awareness but the use of contraception was reported to be low (Okpani, 2000; Oye-Adeniran, 2005).

Among other factors, a very important factor contributing to unwanted pregnancy in Nigeria as known in other countries is found to be low level of contraceptive use (Oye-Adenran et al, 2005, Okpani and Okpani, 2000). In the past, Nigerian couples desire more children due to reasons such as; security at old age, family support, help in the farm and other socio-economic importance (Bankole et al., 2009). It has been however noted that in recent times, Nigerian women now have a predetermined number of children due to their desire to limit family size so that they can provide a better education for their children, increase their own participation in the labor force, and urbanization (Bankole et al 2009; Okonofua et al. 1999). Thus, the need to use contraceptive to space and to limit fertility is being embraced.

Also, contraceptive prevalence rates have been associated with maternal mortality and countries with low contraceptive prevalence rates are also countries with very high maternal mortality ratios (Okonofua et al, 1999). The use of modern contraceptive methods translates into the prevention of unwanted pregnancy and subsequent abortions. (Monjok et al, 2010).

The proportion of Nigerian women using modern contraceptive methods rose from 3% in 1990 to 8% in 2003 and 10% in 2008 (NDHS, 2003; NDHS, 2008). The low rate of contraceptive use in Nigeria results in high fertility rates, particularly in the rural areas and the northern part of the country (Monjok et al, 2010). High fertility rate accounts for Nigeria's high maternal, infant, and neonatal mortalities, and the use of modern contraceptive methods has been reported to be very limited in the northern part of Nigeria with only 9% of Nigerian women reported to be using modern contraceptive in 2003. In addition, only 3% of women from the northeast and the northwest reported using a modern method, compared with 23% in the southwest (NDHS, 2003). Going by the 2003 NDHS report, the TFR was 7.0 children per woman in the northeast and 6.7 children per woman in the northwest as compared with only 4.1 in the southwest (NDHS, 2003). This gives an idea that there is still a large unmet need for contraceptive use in Nigeria (NDHS, 2003).

2.9 DETERMINANTS OF CONTRACEPTIVE USE

Several factors have been documented to affect the use of contraceptive among populations, some of the factors that have been identified to affect contraceptive use include contraceptive choice, availability and affordability, level of education, occupation, partner's/husband's approval, religious and cultural values, social networks, sources of contraceptive commodities, house hold influences, unmet needs. Others factors include; children ever born, age at first sex, age at first marriage, sex composition of the living children, wealth index, place of residence and region of residence (Oye-Adeniran et al, 2005; Monjok et al, 2010; Oyedokun, 2007; Orji and Onwudiegwe 2002).

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2.9.1 CONTRACEPTIVE CHOICE, AVAILABILITY AND AFFORDABILITY

Apart from knowledge about contraceptive commodities, their availability is important in determining safe behaviour in terms of preventing unwanted or mistimed pregnancies (USAID, 2009). Availability of choices as well as financial constraints is listed among key barriers to contraceptive use worldwide (Oye-Adeniran et al, 2005; Monjok et al, 2010).

There are substantial evidence revealing that a restricted choice of contraceptive methods has inhibited the opportunity of individuals and couples to obtain a method that suits their needs and this has resulted in lower levels of contraceptive prevalence rate (Ross et al. 2002). A study in Taiwan noted that each new method seemed to increase existing prevalence; similar increases were evident in South Korea, Thailand and Hong Kong (Population reference Bureau, 2004). Another study found that broadening the choice of contraceptive methods increased overall contraceptive prevalence in Bangladesh, where household provision of injectables in early 1977 helped raise contraceptive prevalence from 7% to 20%, the introduction of tubectomy services in 1978 helped increase prevalence by an additional 10%, and household insertion of IUDs in 1981 elevated prevalence yet further (Population reference Bureau, 2004). There are significant regional differences; availability was greatest in East Asia and least in sub-Saharan Africa while other regions are in between. East Asia attained a high level of availability early and experienced little change thereafter. On the other hand, sub-Saharan Africa shows recent improvements, although at fairly low levels (Population reference Bureau, 2004). Condom availability seems to have increased more sharply in Africa and Asia than in Latin America, while the availability of female sterilization appears to have risen the most in Latin America (Ross et al, 2001).

Studies on contraceptive availability and affordability have shown that cost-effective, easily accessible, and easily administered modern method are paramount to contraceptive use and that affordability and willingness to pay took precedence over quality of services (Oye-Adeniran et al, 2005; Syed et al 2009).

2.9.2 EDUCATION

In many parts of the world, researchers have tried to establish the relationship between the level of education of a woman and the use of contraceptives (Odimegwu, 1997; Oye-Adeniran et al, 2005). With more education, women are said to be more willing to try new innovations such as the use of contraceptive especially, modern contraceptive (Oyedokun, 2007) which has been argued to have remained an innovation in many Third World countries. (Caldwell and Cadwell, 1977).

It is postulated that, with increase in the level of education, a woman is likely to have a greater say in decisions that affect her sexual and reproductive life. She is more likely for instance, "to be able to negotiate safe sex; obtain contraceptives and use them effectively: as well as seek appropriate health services" (Grady et al, 1999). With increased education, women are also argued to have more knowledge of contraceptive methods or of how to acquire them. Education also increases women's autonomy and therefore their ability to make decisions regarding contraceptive use (Saleem and Bobak, 2005). There is good evidence that for whatever reason, women's education does indeed promoted the use of contraception in most developing countries outside of tropical Africa (Diamond and Vale, 1999). Studies have found a positive association between the educational level of both spouses and the use of contraceptive methods. After controlling for all individual, cultural, fertility and contextual variables, a female's educational status was found to be a stronger predictor of method use and method choice than that of her husband (Izugbara and Ezeh, 2010). Female education promotes women's reproductive health. It correlates with increase use of modern contraceptive, decrease risk of maternal death and lower fertility and has been described as "the single most influential factor in improving child health and reducing infant mortality" (UNFPA,1996).

2.9.3 OCCUPATION

Occupation is another factor that has been found to be correlated to contraceptive use. In the traditional African society women do not work apart from the family and household responsibilities like cooking, washing and cleaning and most especially child bearing and rearing. However in the era of modernization, many women are compelled to seek

employment opportunities due to economic pressures placed on females as a result of harsh economic conditions in most countries in sub-Saharan Africa. Increased employment opportunities for women may motivate couples to have fewer children (Aghajanian and Merhyar, 1999). Previous studies have revealed that variation exists in the patterns of fertility and contraceptive use among women in the formal and informal sectors. For instance, the findings of Eshetu show that longer birth interval, higher contraceptive use, shorter duration of breast feeding and lower desired family size were observed for women in the formal sector while for women in the informal sector, shorter birth interval, longer lactational period, lower contraceptive use and higher desired family size were observed (Eshetu, 1994). Contrarily, Oye-Adeniran et al in a national survey and Igwegbe et al, in a study in Nnewi Nigeria did not find occupation as one of the factors independently associated with contraceptive use (Oye-Adeniran et al 2006; Igwegbe et al, 2009).

2.9.4 PARTNER'S/HUSBAND'S APPROVAL

Even though most Studies on contraceptive use and behavior focused more on women, the considerable and sometimes coercive role of men concerning contraceptive decisions is apparent (Abasiattai, 2006). Consent from partner is a recognized issue in the success of family planning program. Many women in northern Nigeria are keen on using modern contraceptives only if their spouses approve of them (Duze and Mohammed, 2006). In a Nigeria study, more than 80 percent of women respondent using contraceptives did so with the knowledge of their partner (Oye-Adeniran et al 2006). Gender differences in attitudes toward specific contraceptive methods play a role in contraceptive choice and use and this has implications for success of family planning programme (Thorburn, 2007). Studies indicate that the attitudes and decisions about women toward contraceptive method may reflect the perceptions of their husbands' preferences (Duze and Mohammed 2006, Ibisomi, 2009). Incorrect perception of husbands' attitudes towards family planning by women may affect their use of contraceptives and improved spousal communication has been shown to encourage contraceptive use (De Rose et al, 2004; Salway, 1994).

2.9.5 RELIGIOUS AND CULTURAL VALUES

Religious beliefs have been shown to affect perception about family planning and contraception. The major religions of the world still express some reservations regarding the use of certain forms of contraception. Contraception is also an issue that is infrequently and reservedly discussed within the religious circles. Religious beliefs may determine individual's use of contraceptives and the methods that will be adopted. Muslims tend to have a higher rate of disapproval than Christians (Ibrahim and Sadiq, 1999). In a national study conducted in Nigeria, Oye-Adeniran et al, reported that more than 25% of non users of contraceptives cited religious reasons (Oye-Adeniran et al., 2006). Religion has been one of the reasons put forward to explain the difference in contraceptive use between Southern and Northern Nigeria. Many studies have reported that contraceptive use is higher among Christians than Muslims (Onuzurike and Uzochukwu, 2001; Oye-Adeniran et al., 2006). In Northern Nigeria where Muslims are the majority, it is not surprising that contraceptive use is low.

Religious beliefs also influence contraceptive choices. The Roman Catholic denomination in Christian religion is known to discourage use of modern contraceptives while encouraging adherence to use natural forms of family planning (Onuzurike and Uzochukwu, 2001; Dawn, 2014). Also in another study religious barrier was responsible for low acceptability and use of intra-uterine contraceptive device by Muslim women as opposed to their Christian counterparts (Osayi Osemwenkha, 2004). Religious objection to use of modern contraceptives has also been linked with sourcing of contraceptives from patent medicine stores rather than specialized health facilities (Aghajanian et al, 2009; Manjok et al. 2010).

2.9.6 SOCIAL NETWORKS.

The behavior of individuals are influenced by social networks in which they belong such as the extended family, friends, neighbors, political groups, church groups, youth groups, and other formal and informal associations. For many women, informal communication is a primary source of family planning information. For instance, women

may decide on important aspects of their sexual behavior based on discussions with other women about family planning and contraceptive use (Monjok et al, 2010).

The influence of social networks is crucial to informed choice. Individuals may seek the approval of others and modify their own behavior to please or meet the expectations of others (Aghajanian and Merhyar, 1999). Myths and miscommunication about contraceptives disseminated among social groups have been shown to impact on individual's choice and use of contraceptives (Ankomah et al, 2011). Social networks also present an opportunity for family planning programme to propagate new ideas and positively influence community reproductive attitudes and behavior.

2.9.7 HOUSEHOLD INFLUENCE

Family dynamics have been shown to be related to contraceptive use (De Rose et al. 2004). Apart from the interactions between spouses, the interactions between the couple and a third party such as extended family members may play a role in the couple's decisions about issues. (Babalola et al, 2002).

In cultures where it is common for major family decisions to be influenced by actors beyond the couple, extended family influence is crucial to the use and choice of family planning. Char et al showed that mother in-laws are able to influence young couples' family planning decisions in rural India (Char et al, 2010). Extended family may put pressure on couples regarding the number of children and the preference for a particular sex. This in turn may influence couples decision to use or not to use a contraceptive method.

This influence may be demonstrated in women being able to be more open about their use of contraceptive. Conflicts in the attitude and preference of family planning may cause women not to use modern contraceptive because other household members disapprove of such method. The result may be an increased tendency to rely on less effective methods of contraception or to conceal their use of contraceptives (Belohlav and Karra, 2013). Hajason et al, established that couples who had approval of their extended family about family planning were more likely to use contraceptives and utilize the nearest health center (Hajason et al, 2013).

2.9.8 SOURCES OF CONTRACEPTIVE COMMODITIES

Understanding the sources of contraceptive commodities is a key to planning effective delivery of family planning services. It is suggested that the sources of contraceptive commodities may not only limit the number of available methods but can also affect the kind of information clients receive on the methods chosen. Incorrect information leads to unsatisfactory usage, which can ultimately result in high discontinuation and failure rates (Oye-Adeniran et al, 2005).

The sources of contraceptives that have been reported in Nigeria include facilities in both public and private sector such as government tertiary, secondary and primary health centres; private clinics or hospitals; chemist/patent medicine and pharmacy shops. Findings from the 2003 Nigeria Demographic and Health Survey have previously shown that the private sector was the most frequently reported source of contraceptive supply, providing contraception to two and a half times as many women as the public sector (NDHS 2003).

A study on Sources of Contraceptive Commodities for users in Nigeria revealed that there is an influence of marital status on sourcing of contraceptives. It was observed that married couples where more likely to obtain contraceptive commodities from public health centres and this contrasted with single respondents who preferred to source contraceptive commodities from private health settings like chemist/patent medicine shops. (Oye-Adeniran et al, 2006).

2.9.9 UNMET NEED

The concept of unmet need for contraceptives has been used to explain the low contraceptive use observed in some developing countries characterized by high fertility rates (Monjok et al, 2010). A woman has an unmet need for contraception if she is fecund, sexually active, not using any contraceptive methods, and does not want a child for at least two years ("spacers") or wants no more children ("limiters") (USAID, 2005). In countries like Brazil and Columbia (Latin America) that have widespread use of contraceptives (>70%) and low fertility rate (two births per woman) have low unmet need of 6 and 7% respectively (Ashford, 2003). However, in some countries with high fertility, women have low unmet need because their desire for children is high and therefore little gap exists between their

childbearing potentials and contraceptive use. This phenomenon was noted in Chad where women have high fertility rate (6.6), low contraceptive use (4%) and a low unmet need for family planning (10%) (Ashford, 2003).

2.9.10 CHILDREN EVER BORN

The number of children ever born has been shown to have influence on the use of contraceptives. It is commonly assumed that those women with more children are more likely to use modern contraceptive methods particularly to halt fertility than their counterparts with fewer children (Duze and Mohammed, 2006). However, Oyedokun, did not find any significant influence of children ever born on "ever used of contraceptives" and "currently using contraceptives" in a study in south-west Nigeria (Oyedokun, 2007). The number of surviving children among the children ever born was shown to have a better association with current contraceptive use in a study in Cameroun (Ekani-Bessala et al, 1998).

2.9.11 SEX COMPOSITION OF LIVING CHILDREN

The number of and composition of living children are important factors influencing fertility behavior such as the use of contraceptives (Orji and Onwudiegwe 2002). In general, it has been shown that couples who have higher number of living children were more likely to use contraceptives than couples with fewer numbers of children. However among couples who have desired low family size, the likelihood of contraceptive use was reduced if the couples do not have the desired number of sons or daughters (Buravisit, 1989).

Strong sexual preference has been shown to affect contraceptive use in Asia and Africa. The psychological needs as well as socio-economic and cultural factors such as. religious beliefs, genealogy, inheritance system and marriage rites usually determine the preferred sex and therefore the direction of relationship with contraceptive use. For instance in many societies in Thailand it has been shown that women with at least one living son where more likely to use contraceptives than women with at least one living daughter (Buravisit, 1989). Among developing countries the impact of having a preferred sex on contraceptive use has resulted in greater fertility decline in Asia than in other regions (Bairagi, 2001). Studies in Nigeria suggest that son preference is a determinant of

contraceptive use (Feyisetan and Casterline, 2000; Orji and Onwudiegwe 2002). In particular this influence was observed to be stronger in the eastern and southern minorities compared to other regions of Nigeria (Fayehun et al, 2011). The sex preference however do not appear to influence contraceptive use in modern societies. (Buravisit, 1989).

2.9.12 AGE AT COITARCHE

The age at first intercourse affects contraceptive use including the type of contraceptive use as well as the manner in which contraceptives are used. Wendy et al demonstrated that initiation of sexual intercourse at 13 years or below was associated with less odds of using contraception during first intercourse compared to those who initiated sexual intercourse at a later time (Wendy et al, 2000). The age at coitarche is usually related to the type of contraception practiced. It is not generally expected that many young girls engaging in sexual intercourse at an6 early age will use the highly effective forms of contraceptive since they may not have the well withal to access them (Wendy et al, 2000). A study showed that condom was the common form of contraception practiced by adolescent who had sexual debut at an early age. Also, younger adolescents were less likely to select pills compared to condoms for contraception at first sexual debut (Wendy et al, 2000). The consistency of contraceptive use is also likely to be low when used by individuals engaging in sex at a low age. In the same study, higher age at coitarche was associated with consistent contraceptive use (Wendy et al, 2000).

The effect of the age at first intercourse on contraceptive use is thought to be mediated by several factors such as the nature of the relationship of the partners. Adolescent who engaged in sexual intercourse early were more likely to have causal sexual relationships which is thought to encourage low contraceptive use compared to more matured and intimate sexual relationships (Miller et al, 1997; Inazu, 1987).

In Nigeria, studies showed that the average age at sexual debut range from 12 to 20 years and a low use of contraceptive was observed among the young women in this group (Oye-Adeniran et al, 2005; Amazigo et al, 1997). Among the reasons given for not using contraception include: "not thinking about using contraceptives", "not having sexual

intercourse to have a baby", and "unplanned sexual debut" (Abiodun et al, 2009; Okpani and Okpani, 2000).

2.9.13 AGE AT FIRST MARRIAGE

The societies where child births are encouraged within the marriage relationships, age at first marriage plays a fundamental role in influencing fertility rates. Indeed the decline in fertility rates has been in part attributed to an increased tendency to delay marriage in many developing countries (Gavin, 2012; Sunil et al, 2004; Blanc et al, 1998). In many cases, the tendency to delay marriage is related to the level of female education. For educated women, the presence of several competing alternatives to marriage often results in the postponement of marriage (Sunil et al, 2004). The same reasons explain the tendency to delay child birth and therefore increase the use of contraceptives (Sunil et al, 2004). On the other hand, women getting married at a very young age may be naive and unable to effectively negotiate use of modern contraceptives. This is likely to explain the low contraceptive use rate particularly in northern Nigeria where women tend to marry at an early age (Makinwa-Adebusoye and Feyisetan, 1994).

2.9.14 WEALTH QUINTILE CATEGORY

A direct relationship also existed between contraceptive use and the wealth category in which a woman belongs. In general, richer and financially more empowered women are more likely to access and use modern contraceptives (Do and Kurimoto, 2012). This is more so in Nigeria for instance, where contraceptives and family planning services are often procured, women in the lowest categories of wealth index may not be able to afford the cost of using a modern contraceptive (Adebowale et al, 2011 (a)). This is similar to the report of Creanga et al, who demonstrated that poorer women were prone to use short-term contraception and less effective traditional method and women in the richest wealth quintile were more likely than women in the poorest wealth quintile to use long-term contraception which is more expensive than short-term contraception and usually provided at clinics (Creanga et al, 2011).

2.9.15 OTHER DETERMINANTS OF CONTRACEPTIVE USE

Marital status of women has been outlined as one of the determinants of contraceptive use (Odimegwu, 1997). Being in a marital union was a significant predictor of contraceptive use (Odimegwu, 1997). In some traditional settings, sexual intercourse is greatly disapproved of outside marriage. The need for contraception is thus more likely among women who are married in such settings. However, in societies were childbirth out of wedlock is frowned at, young unmarried women are more likely to use contraceptive.

Difference in contraceptive use is often noted among different region of a country. Women in the southern part of Nigeria were almost twice more likely to have ever used contraceptive than their cohort residing in the north (Adebowale et al, 2011(b)). Regional differences are often observed in the direction of influence of other variables on contraceptive use. For instance, data in a Nigerian studies indicate that the level of contraceptive knowledge, female education and empowerment is lower in northern Nigeria compared to the southern part. (Kwarai, 2011; Monjok et al, 2010)

The place where a woman resides is likely to determine her use of contraceptive: women residing in rural area are less likely to ever used contraceptive than urban women (UNFPA Nigeria Country Office, 2010). This can be explained by the fact that urban women have more access to family planning programmes and contraceptive services than rural women since family planning facility are more concentrated in the urban centers. Also, women in urban areas are also more likely to be educated, knowledgeable and more informed about the use of contraception. The unmet needs for contraception are more peculiar to rural than urban women (Adebowale et al, 2011(b)). The urban-rural difference in contraceptive use appears to be more pronounced in the southern part of Nigeria compared to the northern part of Nigeria. (UNFPA Nigeria Country Office, 2010).

CHAPTER THREE

METHODOLOGY

3.1 THE STUDY AREA

Northern Nigeria is a geographical region in Nigeria. It comprises of nineteen states and the Federal Capital Territory, it is stratified into three zones thus:

Table 3.1: Northern Region Zone and States

NORTH CENTRAL	NORTH EAST	NORTH WEST
Abuja	Adamawa	Jigawa
Plateau	Bauchi	Kaduna
Benue	Borno	Kano
Nasarawa	Gombe	Katsina
Kogi	Taraba	Kebbi
Kwara	Yobe	Sokoto
Niger		Zamfara

Based on the 2006 population census, the population of northern Nigeria was estimated at 75,025,166 (National Population Commision, 2006). The inhabitants of Northern Nigeria included people from different ethnic backgrounds. They include, Hausa, Fulanis, Tivs, Kanuris, Igala, Yorubas among others. The commonest language in use in the Northern States is Hausa.

In majority of the northern states, health facility utilization, education, the judicial system and other institutions are influenced by the Islamic religion which is the most common religion practiced (NPC, 2006). Some states practice the sharia (taken from the Koran) system of justice. Education of most children in Northern Nigeria begins with learning Arabic and reading the Koran, however, western education has gained much ground in the region in recent times.

Northern Nigeria is made up of predominantly the Hausas, the Hausa society is patrilineal and hence, men continue to dictate the pace of fertility. The Hausa's have a subjective view of fertility regulation; children are seen as blessing from almighty Allah. The Hausa's believe that fertility is not within a person's ability to determine coupled with the doubt in the use of modern contraceptives, hence, the high demand for children and a low motivation to regulate births in northern Nigeria.

It is important to emphasize that, the north central behaves slightly different from other regions in the north in socio-cultural and other characteristics because of the heterogeneous nature of its population composition. For instance, part of the population composition in the north central Nigeria includes Yorubas who are known for high level of literacy in Nigeria.

3.2 STUDY DESIGNAND DATA COLLECTION PRCEDURES

The study design used during the data collection by the data originators was cross-sectional.

The original survey was carried out by the National population Commission NPC with technical assistance from ICF Macro in all stages of the survey and funding from United States Agency for International Development in Nigeria (USAID/Nigeria) and the President's Emergency Plan for AIDS Relief (PEPFAR). The 2008 Nigeria Demographic and

Health Survey were conducted between February 22, 2008 and February 23, 2009 (NDHS Report, 2008). The 2008 Nigeria Demographic Health Survey (NDHS) is a national representative survey of 33,385 women age 15-49. Cluster sampling method was used during the data collection. The primary sampling unit (PSU), referred to as a cluster for the 2008 NDHS, was defined on the basis of Enumeration Areas (EAs) from the 2006 EA census frame.

Originally, a representative sample of 36,800 households was selected for the 2008 NDHS survey, with a minimum target of 950 completed interviews per state. In each state the number of households was distributed proportionately among its urban and rural areas

The 2008 NDHS sample was selected using a stratified two-stage cluster design consisting of 888 clusters, 286 in the urban and 602 in the rural areas. Once the number of households was allocated to each state, the number of clusters (calculated based on an average sample taken from 41 completed interviews or about 41 selected households) was calculated by dividing the total sample in the state by the sample taken. Finally, all women 15-49 years were interviewed in each cluster. Before the selection in a state, all EAs were stratified by urban and rural areas in order to reflect the urban rural composition of Nigeria.

3.3 STUDY POPULATION

The current study focused on women data-set with emphasis on Northern Nigeria, the number of women interviewed in all the 3 regions of northern Nigeria was 17,031while the number included in the analysis is presented in Table 3.2.

Table 3.2: Number of Women Included in the Analysis

Analysis		Total
Contraceptive (Ever-use)	Total women interviewed minus women who were not sexually active	14081
Contraceptive (Current-use)	Total women interviewed minus (women who were not sexually active plus women who had no sexual intercourse one month prior to the interview plus pregnant and breastfeeding women)	8787
Parity Progression	Women who have had at least one birth	12158
Adjusted TFR	Total population of women interviewed	17031

3.4 DATA

The Data set for this study is NGIR51V.SAV and this was obtained from ORC Macro by request through this web site www.measuredhs.com. The data set was downloaded in the SPSS format and as such the analysis was done with SPSS version 16.0. To understand each of the variables in the data set, the 2008 DHS recode file which is a document that describes the standard recode defined for the fourth round of DHS surveys was also downloaded from the same website (www.measuredhs.com). The Recode structure provides a description of each variable in the data file. This data set was derived from the individual women questionnaire and the questionnaire included some questions about socio-demographic status. fertility history and methods of contraception used before the most recent pregnancy.

3.5 WEIGHTING OF THE SAMPLE

Sample weight was applied to the data set. The data was weighted to allow representativeness of the sample and to extrapolate the existing sample to the areas not included in the sample since cluster design was used during data collection. The weighting was carried out by creating a weighting variable and dividing the sampling weight by 1,000,000. The newly created variable was set before the commencement of the analysis. The cases for the three northern zones namely, north central, north west and north east were pulled together to form the data set for northern Nigeria. This was done by recoding the variable region into northern and southern Nigeria.

3.6 ETHICAL APPROVAL

Being a nationally representative survey, 2008 Nigeria Demographic and health Survey was reviewed and granted approval by the national Health Research Ethics Committee and assigned the number -NHREC/01/01/2007, for the study period of February 22, 2008 to February 23, 2009. Also, informed consent was obtained from the respondents prior to the administration of the questionnaire. At the point of accessing the data, permission was granted to use the data set by measuredhs.

3.7 EXCLUSION CRITERIA

a) Women who have never had sexual intercourse with men were excluded in estimating proportion that had ever used contraceptive.

b) Women who had no sexual intercourse a month prior to the survey were further excluded in estimating current use. Also excluded were those currently breastfeeding and pregnant. This is because these set of women do not need contraceptive to either delay or halt childbearing. Although, condom could be used by these women to prevent sexually transmitted diseases. To avoid any element of bias that the inclusion of such women may contribute to the study, they were excluded.

c) Women who have never given birth were not included in the estimation of Childbearing Progression.

3.8 DATA ANALYSIS

The required data for this study were extracted using SPSS and subsequent analysis was performed with SPSS version 16.0. Total Fertility Rate and parity progression probabilities were calculated using excel software package. The Chi-square, logistic regression, Kaplan Meier and P/F ratio models were applied in analyzing the data for the study.

3.9 THE ANALYSIS FORMAT

3.9.1 Background Characteristics of the women:

Data on the background characteristic of the women were analysed and summarized into frequency tables and charts. The background characteristics are; level of Education, religion, ethnicity, age, place of residence, marital status, occupation and number of children ever born among others. These are covariates which are likely to determine the use of contraceptive among women in northern Nigeria and they were based on existing work on contraceptive both in Nigeria and other countries.

3.9.2 BIVARIATE ANALYSIS

3.9.2.1 Chi square: The dependent variable were "ever used and" "Current use" of contraceptive, these were cross tabulated against each of the independent variable. The independent variables that were found to be statistically significant were further analysed using multiple logistic regression.

3.9.2.2 Logistic regression for contraceptive use: Logistic regression was applied to identify those factors which could be used in predicting the odds of ever used and current use of contraceptive.

Outcome of the dependent variable are:

For ever use of contraceptive;

- X= 1 if ever used
- X=0 if never used

For current use of contraceptive;

- X= 1 if currently using
- X=0 if otherwise

3.9.2.3 The logistic regression model

The logistic regression model is of the form

$$Z_j = \log\left(\frac{\pi_j}{1-\pi_j}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots\ldots\ldots \beta_j X_j$$

Where

π_j is the probability the ith case experiences the event of interest

Z_i is the value of the unobserved continuous variable for the ith case

The model also assumes that Z is linearly related to the predictors.

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots\ldots\ldots \beta_j X_j$$

Simply put, in the logistic regression model, we postulate that the probability, P_x of a woman to have ever used/currently using contraceptive depends on a set X of 'n' socio-demographic factors $X_1, X_2, \ldots\ldots\ldots, X_n$ in the following way:

3.9.3 Total Fertility Rate

The total fertility rate (TFR) is the average number of children that would be born alive to a woman (or a group of women) during her lifetime if she was to pass through all her childbearing years (15-49 years). If the current age-specific fertility rate is experienced throughout the childbearing period

The TFR for the whole northern region was calculated using the formula below

$$\sum_{n=15}^{49} \frac{\text{babies born by age n}}{\text{number of women aged n}} X\,5$$

3.9.3.1 Adjusted TFR

An adjusted TFR was calculated using an indirect approach-the P/F (Parity/Fertility) ratio technique (UN, Manual X).

Assumptions of the model:

- Fertility for the population under study remained constant for sometime in the past. In Nigeria, the fertility rate can be assumed to be constant since the figure (5.7) remains the same 2003 and 2008 NDHS.
- The reported number of children ever born to women in their early ages, say 15-35 is more or less accurately reported. This is possible in Nigeria as younger women were likely to remember and report the actual number of children they have since the event was still recent and fresh in their memory
- The reported number of births for the previous year may suffer from errors resulting from inaccurate perception by the respondents of the reference period, but these errors are invariant with age.

The Coale and Trussell P/f ratio model, an indirect approach was used and the adjustment technique was based on questions on the total number of children ever born and the number of children born a year preceding the survey. This is done by using the average parities of younger women to obtain a set of fertility rates that is generally more reliable than either of its constituent parts. These information were available in the data set used for this study and thus made the analysis feasible.

3.9.3.2 Computational procedures (p/f ratio)

1. **Step 1 Average Parities reported *P(i)*:**

$$P(i) = \frac{Total\ number\ of\ children\ ever\ born\ to\ women\ in\ age\ group\ (i)}{Total\ number\ of\ women\ in\ age\ group\ (i)}$$

The denominator includes all women in age group *(i)* irrespective of marital and fertility status of the women.

2. **Preliminary fertility schedule *f(i)*:**

$$f(i) = \frac{Number\ of\ births\ in\ the\ year\ preceeding\ the\ survy\ in\ age\ group(i)}{Total\ number\ of\ women\ in\ age\ group\ (i)}$$

3. **Cumulated fertility schedule for a period $\emptyset(i)$**

$$\emptyset(i) = 5 \times \left[\sum_{j=0} i\, f(j)\right]$$

4. **Average parity equivalents for a period (F(i)):**

$F(i)$ are computed by interpolation using the period fertility rates $f(i)$and cumulated fertility values $\emptyset(i)$Different techniques have been proposed for the interpolation Among the contributors to the methods are; Brass. Coale and Trussel while a simple polynomial model of fertility to know the relationship between cumulated fertility schedule and average parity for successive age groups was fitted by brass. Coale and Trussel fitted a second degree polynomial which yielded equation (1) below.

$$F(i) = \emptyset(i-1) + a(i)f(i) + b(i)f(i+1) + c(i)\emptyset(7) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

For (i)= 1,2,3,....

a(i), b(i), c(i) are constants (as shown in appendix 2)

However, for F(7), the value is computed using;

$$F(i) = \emptyset(6) + a(7)f(7) + b(7)f(6) + c(7)\emptyset(7)$$

5. *Fertility Schedule for conventional five-year age groups (f (i)):*

Using the equation below:

$$f^{+} = [(1-w)]f(i) + w(i)f(i+1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: $W(i) = X(i) + Y(i) \times \frac{f(i)}{\emptyset(7)} + Z(i) \times \frac{f(i+1)}{\emptyset(7)}$

The values of $x(i)$, $y(i)z(i)$ will be shown in appendix

Note: since childbearing is assumed to cease after age 50; there is no weighting factor i=7

Therefore. $f^{*}(7) = [1 - w(6)]f(7)$

6. *Adjustment of period fertility schedule:*

This is done by calculating the P/F ratios i.e. average parity (column 5) divided by parity equivalent (column 9)

15-19 P(1)/F(1)

20-24 P(2)/F(2)

. .

. .

. .

. .

. .

If the adjustment factor falls consistently between the age range 20-34, then the value of K would be estimated as the average of $P(2)/F(2), P(3)/F(3)$ and $P(4)/F(4)$

$$k = P(2)/F(2) + P(3)/F(3) + P(4)/F(4)$$

If the adjustment factor does not fall consistently within the interval 20-34, the K can be computed as weighted average of $P(2)/F(2)$ and $P(3)/F(3)$. The weights are the number of women in each age group as a proportion of women in both age groups.

$$k = P(2)/F(2) \times \frac{FP(2)}{FP(2)+FP(3)} + P(3)/F(3) \times \frac{FP(3)}{FP(2)+FP(3)}$$

Then, the adjusted age specific fertility rates for conventional age groups $f^{*}(i)$ can be estimated by simply multiplying the $f^{+}(i)$ values by the adjustment factor K. for example:

$$f^{*}(1) = kf^{+}(1)$$

$$f^{*}(2) = kf^{+}(2)$$

7. *The adjusted total fertility rate for the total sample is then estimated as multiplying the sum of average age-specific fertility rate* $f^*(i)$ by 5.

$TFR = 5 \square f^*(i)$

3.9.4 Child Bearing Progression

For the computation of Child bearing progression, all women of reproductive age (i.e. those in age group 15-49) and who have ever given birth were selected. The Birth order number (i.e 1^{st} birth, 2^{nd} birth etc.) was cross tabulated against year of birth. The year of birth was grouped into three year interval starting from 1971-1973, 1974-1977,...,2007-2008. Since the study examines the influence of contraceptive use on child bearing progression, the parity progression probability was obtained for women who have ever used and never used contraceptive.

The total birth order for each year was obtained and subsequently a survival analysis technique (Kaplan-Meier method) was carried out. The Kaplan-Meier method was used to calculate the survivorship function.

3.9.4.1 Kaplan Meire survivorship function

The probability of survival through this interval =(nj-dj)/nj.

Thus the probability of surviving from 1971-1973 to 2007-2008 =(nj-dj)/nj

Therefore, the Kaplan Meire estimate of the survivor function will be

$S(t) = \prod^{k}_{j=1} [nj-dj/nj]$

CHAPTER FOUR

RESULTS

4.1 Demographic characteristics of the respondents

Median age of women involved in the study was 28.0years. Over 20% of the women were between the ages of 25-29 years while age group 44-49 had the least representation of 9.9%.

Approximately 85% had at least one surviving and the remaining 15% had no surviving child. The mean living children was 2.9±2.5.

Median age at marriage was as follows; 15.0 years, there were substantial cases of early marriage as 37.7% married at ages less than 15 years and about 82% were already married before 20 years whereas, only a few (0.5%) married at ages 30 years and above

Table 4.1: Percentage Distribution of the Respondents According to Demographic Characteristics

Characteristic	N=14081	%100
Age		
15-19	1811	12.9
20-24	2644	18.8
25-29	2887	20.5
30-34	2118	15.0
35-39	1781	12.6
40-44	1441	10.2
45-49	1399	9.9
Median age	28.0years	
Living children		
0	2174	15.4
1-2	4269	30.3
3-4	3777	26.8
5+	3861	27.4
Mean number of living children ±S.D	2.9 ± 2.5	
Age at marriage		
10-14	5303	37.7
15-19	6331	45.0
20-24	1432	10.2
25-29	352	2.5
30+	66	.5
don't know	597	4.2
Median age at first marriage	15.0 years	

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Mean number of living children ±S.D	2.9 ± 2.5	
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15-19	6331	45.0
20-24	1432	10.2
25-29	352	2.5
30+	66	.5
don't know	597	4.2
Median age at first marriage	15.0 years	

4.2 Socio-Economic Characteristics of the Respondents

The data in Table 4.2 shows that the percentage of the respondents was highest in the North West (49.4%) and lowest in the north central (24.8%).Almost 78% live in the rural areas and 22% in the urban centers. Over 90% of the women were married while 4.2% had never married. The remaining percent were either widowed, divorced or were separated.

Approximately 67% of the women had no formal education however, 16.2% had primary education, 12.9 had secondary education and only a very few had higher education (3.6%). Majority of the respondents were women from poorest wealth quintile (34.4%) and about 8% were from richest wealth category. A higher proportion of the respondents (53.8%) were in monogamous marriage than polygamous.

For working status of the women, 56% were in paid employment while 43.2% were not, however, about 0.8% did not specify their work status. Most respondents were Muslims (75.5%), 22.3% were Christians and only few (1.3%) were traditionalist (1.3%). The Hausa/Fulani constituted about 58% of the women. The proportion of women whose husband had no formal education was 54.8% whereas only 8.6% of women had spouses with higher education.

Table 4.2: Percentage distribution of the respondents according to socioeconomic Characteristics

Total	**n=14081**	**%=100.0**
Region		
North Central	3497	24.8
North East	3631	25.8
North West	6953	49.4
Type of place of residence		
Urban	3124	22.2
Rural	10957	77.8
Current marital status		
Never married	597	4.2
Married/living together	12945	91.9
Widowed/ Divorced/separated	539	3.8
Highest educational level		
No education	9482	67.3
Primary	2276	16.2
Secondary	1822	12.9
Higher	501	3.6
Wealth Quintile		
Poorest	4841	34.4
Poorer	3873	27.5
Middle	2576	18.3
Richer	1707	12.1
Richest	1084	7.7
Religion		
Christianity	3138	22.3
Islam	10635	75.5
Traditionalist	189	1.3
others	119	0.8

Table 4.2: Percentage distribution of the respondents according to socioeconomic Characteristics (Cont'd)

Total	**n=14081**	**%=100.0**
Type of family		
Monogamous	7572	53.8
Polygamous	6509	46.2
Work status		
Not in paid employment	6085	43.2
In paid employment	7885	56.0
unspecified	111	0.8
Ethnicity		
Hausa/Fulani	8166	58.0
Igbo	127	0.9
Yoruba	431	3.1
Others	5357	38.0
Partner's Education		
No formal education	7713	54.8
Primary	2118	15.0
Secondary	2181	15.5
Higher	1212	8.6
Don't know	857	6.1

4.3 Contraceptive use

In table 4.3, the prevalence of ever use of contraception in the study area was 13.3% while only 7.2% are currently using contraceptive. For ever use, about 88.3% accounted for modern method while the remaining 11.6% accounted for traditional and folkloric methods while for current use, modern method was 84.1% as against 11.8% traditional and4.1for folkloric method.

TABLE 4.3: Percentage Distribution of the Respondents According to Contraceptive Use Status.

Contraceptive Use	Frequency	Percent
Ever use	1871	13.3%
Current use	636	7.2%
Ever used		
Used only folkloric	83	4.4
Used only traditional	136	7.2
Used modern method	1652	88.3
Total	**1871**	**100.0**
Current use		
Used only folkloric	26	4.1
Used only traditional	75	11.8
Modern	535	84.1
Total	**636**	**100.0%**

Figure 4.1 below depicts the multiple bar chart of the prevalence of contraceptive use according to regions in northern Nigeria. North central region showed higher rates for ever and current use respectively (29.20% and 21.80%) than the north east and north west.

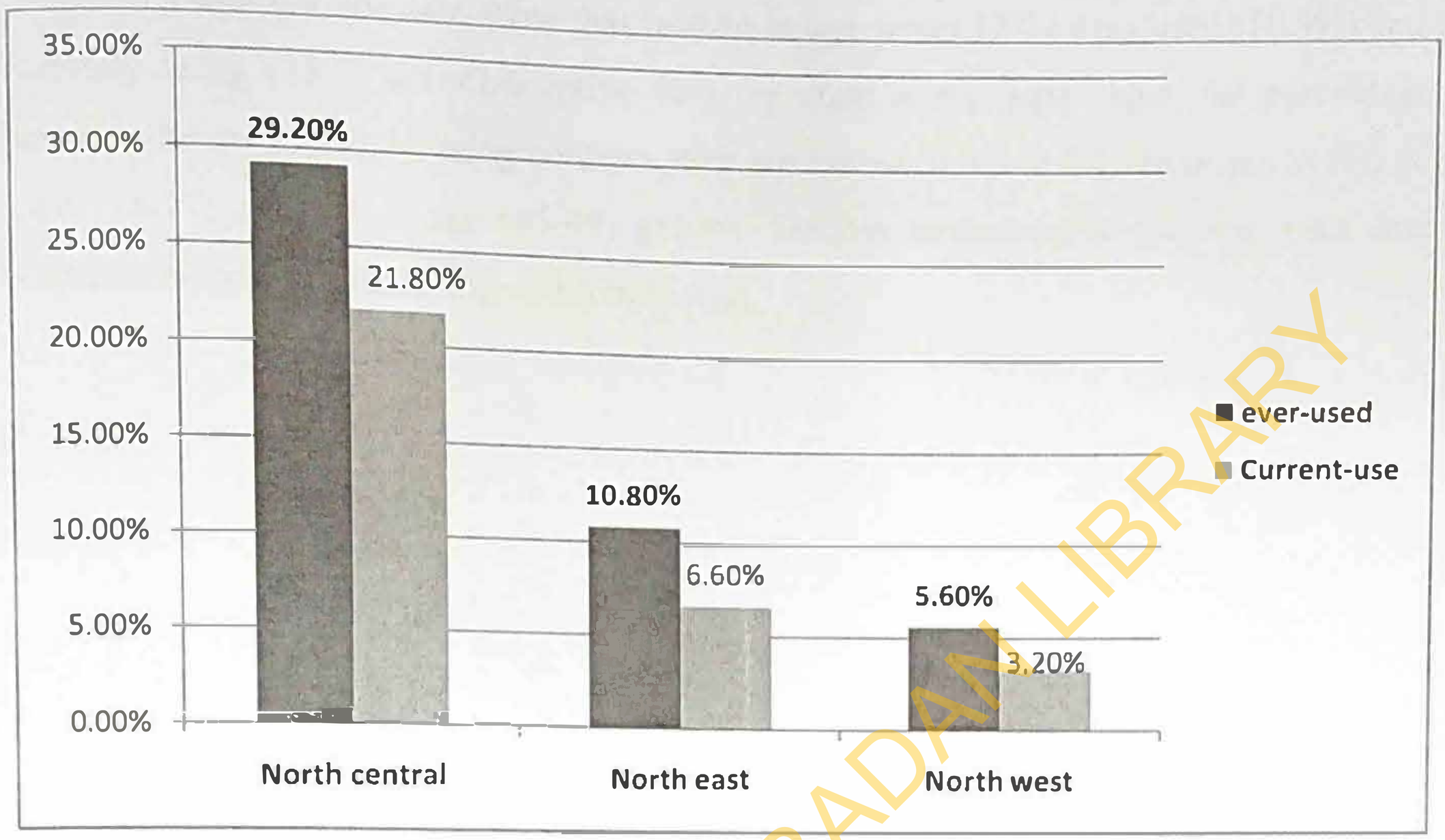

Figure 4.1: Percentage Distribution of Contraceptive Use in Northern Region of Nigeria

4.4 Contraceptive Use by Demographic and Socio-Economic Characteristics

In Table 4.4, the data show that women in age group 30-34 ever used (16.3%) and are currently using (18.7) a contraceptive than the other age groups. Also, the percentage of women who are currently using contraceptive are lowest (4.0% and 4.7% respectively) at the least (15-19) and upper age (45-49) groups. Current contraceptive use was least among women who had 1-2 surviving children (5.4%).

Table 4.4: Percentage Distribution of Respondents' Demographic Characteristics by Contraceptive Use

Characteristic	Ever-use				Current use			
	Yes %(n)	Total women	χ^2-value	p-value	Yes%(n)	Total women	χ^2-value	p-value
Total	**13.3(1871)**				**7.2(636)**			
Age 5-year groups			139.7	p<0.001			37.40	p<0.001
15-19	5.7(104)	1811			4.0 (43)	1067		
20-24	12.6 (332)	2644			7.2 (110)	1529		
25-29	15.3 (442)	2887			8.3 (141)	1706		
30-34	16.3 (346)	2118			8.7 (114)	1309		
35-39	16.1 (286)	1781			8.8 (106)	1210		
40-44	14.6 (211)	1441			7.7 (77)	1003		
45-49	10.8 (151)	1399			4.7 (45)	963		
Living children			55.43	p<0.001			21.88	p<0.001
0	12.1 (262)	2174			7.4 (91)	1224		
1-2	11.1 (473)	4269			5.4 (136)	2539		
3-4	14.7 (556)	3777			8.7 (214)	2460		
5+	15.0 (580)	3861			7.6 (196)	2564		
Age at marriage			692.6	p<0.001			625.3	p<0.001
10-14	8.1 (430)	5303			6.1 (51)	3625		
15-19	12.1 (765)	6331			5.7 (259)	3974		
20-24	22.2 (318)	1432			9.9 (174)	761		
25-29	31.5 (111)	352			11.9 (54)	193		
30+	15.2 (10)	66			12.0 (12)	47		

In Table 4.5, the data depict that the percentage of women who ever used and currently using contraceptive increases with increasing level of education and wealth quintile. For instance, for ever used, the percentage increases from 6.0% among those with no formal education to 56.1% among those with higher level of education. Similar pattern exists for current use of contraceptive.

The data further show that striking differential exists in contraceptive use between women in North Central and other regions in the North and also between the urban (24.8%) and rural (15.5%) women.

Among all the marital groups, married women had the least proportion of its members who had ever used (11.7%) and currently using (6.2%) contraceptives. Analysis by religion revealed that Moslem women were the least users of contraceptive (3.7% current use and 7.5% for ever use). Contraceptive use was more among women in monogamous family (14.0%) than their counterparts in polygamous family (12.5%).

Also, the percentage of contraceptive users was higher among women who are working in paid employment (16.5%) than those who are not working (9.2%). This same pattern was shown for current contraceptive users with respect to work status. Women from the southern part of Nigeria (Igbo and Yoruba) living in the North had higher proportion of its members who ever used and currently using contraceptive than their counterparts who are Hausas/Fulani.

Level of contraceptive use (ever and current use) also increases with increasing husbands' level of education. For ever used, it increased from 5.5% among those with no formal education to 34% among those with higher level of education. Whereas for current use, the proportion vary from 2.1% to 21.9% among husbands' with no formal education and higher level of education respectively.

Table 4.5: Percentage Distribution of Respondents' Socioeconomic Characteristics by Contraceptive Use

characteristic	Ever-use				Current use			
	Yes %(n)	Total women	χ^2-value	p-value	Yes %(n)	Total women	χ^2-value	p-value
Total	**13.3(1871)**				**13.3(1871)**			
Education			188.2	p<0.001			107.0	p<0.001
No formal education	6.0 (565)	9482			2.7 (169)	6332		
Primary	19.1 (434)	2276			10.9 (143)	1314		
Secondary	32.4 (591)	1822			24.5 (217)	884		
Higher	56.1 (281)	501			41.6 (107)	257		
Region			105.7	p<0.001			630.7	p<0.001
North Central	29.2 (1021)	9482			21.8 (350)	1608		
North East	10.8 (393)	2276			5.6 (131)	2326		
North West	6.6 (458)	1822			3.2 (155)	4853		
Place of residence			501.0	p<0.001			244.0	p<0.001
Urban	24.8 (775)	3124			15.5 (292)	1883		
Rural	10.0(1097)	10957			5.0 (344)	6903		
Wealth quintile			112.5	p<0.001			713.3	p<0.001
Poorest	6.3 (307)	4841			2.5 (78)	3137		
Poorer	8.4 (327)	3873			3.9 (96)	2491		
Middle	15.4 (396)	2576			8.2 (124)	1506		
Richer	24.0 (410)	1707			14.5 (145)	999		
Richest	39.9 (431)	1084			29.6 (193)	654		
Current marital status			481.6	p<0.001			488.8	p<0.001
Never married	39.7 (237)	597			46.0 (86)	187		
Married/living together	11.3 (1521)	13488			6.3 (537)	8549		
Widowed/ divorced/ separated	32.8 (113)	345			34.2 (14)	41		
Type of family			629.8	p<0.001			17.39	p<0.001
Monogamous	14.0 (1056)	7572			8.3 (403)	4878		
Polygamous	12.5 (815)	6509			6.0 (233)	3909		

Table 4.5: Percentage Distribution of Respondents' Socioeconomic Characteristics by Contraceptive Use

characteristic	Ever-use				Current use			
	Yes %(n)	Total women	χ^2-value	p-value	Yes %(n)	Total women	χ^2-value	p-value
Total	**13.3(1871)**				**13.3(1871)**			
Education			188.2	p<0.001			107.0	p<0.001
No formal education	6.0 (565)	9482			2.7 (169)	6332		
Primary	19.1 (434)	2276			10.9 (143)	1314		
Secondary	32.4 (591)	1822			24.5 (217)	884		
Higher	56.1 (281)	501			41.6 (107)	257		
Region			105.7	p<0.001			630.7	p<0.001
North Central	29.2 (1021)	9482			21.8 (350)	1608		
North East	10.8 (393)	2276			5.6 (131)	2326		
North West	6.6 (458)	1822			3.2 (155)	4853		
Place of residence			501.0	p<0.001			244.0	p<0.001
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Wealth quintile			112.5	p<0.001			713.3	p<0.001
Poorest	6.3 (307)	4841			2.5 (78)	3137		
Poorer	8.4 (327)	3873			3.9 (96)	2491		
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Richer	24.0 (410)	1707			14.5 (145)	999		
Richest	39.9 (431)	1084			29.6 (193)	654		
Current marital status			481.6	p<0.001			488.8	p<0.001
Never married	39.7 (237)	597			46.0 (86)	187		
Married/living together	11.3 (1521)	13488			6.3 (537)	8549		
Widowed/ divorced/ separated	32.8 (113)	345			34.2 (14)	41		
Type of family			629.8	p<0.001			17.39	p<0.001
Monogamous	14.0 (1056)	7572			8.3 (403)	4878		
Polygamous	12.5 (815)	6509			6.0 (233)	3909		

Table 4.5: Percentage Distribution of Respondents' Socioeconomic Characteristics by Contraceptive Use (cont'd)

characteristic	Ever-use					Current use		
	Yes %(n)	Total women	χ^2-value	p-value	Yes %(n)	Total women	χ^2-value	p-value
work status			160.2	p<0.001			63.22	p<0.001
Not in paid employment	9.2 (557)	6085			4.8 (182)	3831		
In paid employment	16.5 (1300)	7885			9.2 (450)	4884		
Religion			138.8	p<0.001			812.9	p<0.001
Christianity	68.2 (1039)	2138			51.0 (358)	1424		
Islam	7.5 (798)	10635			3.7 (268)	7181		
Traditionalist	11.1 (21)	189			4.7 (5)	106		
others	11.8 (14)	119			6.6 (3)	76		
Ethnicity			133.1	p<0.001			938.4	p<0.001
Hausa/Fulani	5.2 (423)	8166			2.1 (121)	568		
Igbo	48.4 (62)	127			46.5 (33)	71		
Yoruba	43.6 (188)	431			41.8 (84)	201		
others	22.4 (1199)	5357			14.1 (399)	2830		
Partner's education			119.2	p<0.001			724.5	p<0.001
No formal education	5.5 (424)	7713			2.1 (111)	5187		
Primary	15.5 (329)	2118			8.1 (104)	1286		
Secondary	20.2 (440)	2181			13.3 (161)	1211		
Higher	34.0 (412)	1212			21.9 (162)	739		

4. 5 Multivariate Analysis of Ever Used and Current Use of Contraceptive:

Table 4.6: shows the result from logistic regression model of ever used of contraceptive and the sub-regions in the North. Women in the North central and North east were 5.9 (C.I=5.191-6.594) and 1.7 (C.I=1.498-1.986) times respectively more likely to have ever used contraceptives than their counterparts in the North West.

TABLE 4.6: Unadjusted Logistic Regression Analysis of Region and Ever Used of Contraceptive

Region	B	Sig.	exp(β)	95% C.I for Exp(β)	
				lower	Upper
North central	1.767	0.000	5.851*	5.191	6.594
North east	0.545	0.000	1.725*	1.498	1.986
North west	RC	RC	1.000	RC	RC

*Significant at 0.1%

Table 4.7 shows the results from logistic regression model of ever used of contraceptive and socio-economic and demographic factors with adjustment for potential confounding variables. Adjusting for these variables reduces the strength of relationship between ever used of contraceptives and region. Women who reside in the North central and north east were 1.7 (C.I=1.450-2.057) and 1.3(C.I=1.075-1.531) times more likely to have ever used contraceptives than those in the North West.

Women in the following age groupings 20-24, 25-29, 30-34 and 35-39 years were significantly more likely to have used contraceptive than those between ages. The likelihood to have ever used a contraceptive rose with increasing number of children that the women had. Women who had 1-2 surviving children were (OR=2.101; C.I=1.645-2.682) while those with 5and more surviving children were 4.4 times more likely to have used a contraceptive than women who have no children.

The Table further shows that women who marry at age 30 years and above were less likely (OR=0.3; C.I=0.131-0.634; p=0.002) to have ever used contraceptive than those who married very early (at ages less than 15 years). The odds of ever used of contraceptive increased significantly with increasing levels of education, women with primary, secondary and higher education were about 1.6, 2.4 and 4.2 times more likely to have used contraceptive than those with no formal education.

Urban dwellers were more likely to have used contraceptive than rural dwellers (OR=1.4; C I=1.204-1.606). Another notable relationship was observed between ever used of contraceptive and wealth quintile. The richest had the most likelihood to have used contraceptive than their counterparts in the other quintile.

The Yoruba's had the highest likelihood (OR=2.6 CI=1.942-3.453) to have used contraceptive than the hausa/Fulanis among the other ethnic groups residing in the north. Women in monogamous homes were more likely to have used contraceptive than their counterparts in polygamous families. Those women who were in paid employment were more likely to have used a contraceptive than those who were not.

Looking at marital status and contraceptive use, the married were significantly less likely (OR=0.4; C.I=0.256-0.682) to have used contraceptive than the unmarried.

TABLE 4.7: Adjusted Logistic Regression Analysis of Socio-economic and demographic factors and Ever Used of Contraceptive

Background Characteristics	β	Sig.	exp(β)	95% C.I for Exp(β)	
				lower	Upper
Region					
North central	0.546	0.000	1.727*	1.450	2.057
North east	0.249	0.006	1.283**	1.075	1.531
North west	RC	RC	1.000	RC	RC
Age					
15-19	RC	RC	1.000	RC	RC
20-24	0.405	0.002	1.499**	1.153	1.949
25-29	0.474	0.001	1.606**	1.220	2.114
30-34	0.490	0.001	1.632**	1.207	2.206
35-39	0.423	0.010	1.527***	1.109	2.104
40-44	0.326	0.058	1.386	0.990	1.941
45-49	0.212	0.240	1.236	0.868	1.760
Living children					
0	RC	RC	1.000	RC	RC
1-2	0.742	0.000	2.101*	1.645	2.682
3-4	1.252	0.000	3.497*	2.668	4.585
5+	1.491	0.000	4.441*	3.306	5.967
Age at marriage					
<15	RC	RC	1.000	RC	RC
15-19	-0.099	0.172	0.906	0.786	1.044
20-24	-0.187	0.066	0.829	0.679	1.013
25-29	-0.164	0.316	0.849	0.617	1.169
30+	-1.244	0.002	0.288	0.131	0.634

*significant at 0.1%; ** significant at 1%; ***significant at 5%

TABLE 4.7: Adjusted Logistic Regression Analysis of Socio-economic and demographic factors and Ever Used of Contraceptive (Cont'd)

Background Characteristics	β	Sig.	Exp(β)	95% C.I for Exp(β)	
				lower	Upper
Education					
No formal education	RC	RC	1.000	RC	RC
Primary	0.459	.000	1.582*	1.340	1.868
Secondary	0.885	.000	2.422*	1.996	2.939
Higher	1.428	.000	4.171*	3.136	5.546
Place of resident					
urban	0.330	0.000	1.396*	1.204	1.606
Rural	RC	RC	1.000	RC	RC
Wealth quintile					
poorest	RC	RC	1.000	RC	RC
Poorer	0.198	0.027	1.219***	1.023	1.453
Middle	0.438	0.000	1.550*	1.292	1.859
Richer	0.718	0.000	2.050*	1.661	2.531
Richest	0.898	0.000	2.455*	1.900	3.172
Religion					
Islam	RC	RC	1.000	RC	RC
Christianity	0.595	0.067	1.813	0.958	3.430
Traditionalist	0.265	0.403	1.304	0.701	2.426
others	-0.335	0.285	0.715	0.387	1.322
Ethnicity					
Hausa/fulani	RC	RC	1.000	RC	RC
Igbo	0.459	.000	1.582	1.340	1.868
Yoruba	0.885	.000	2.422	1.996	2.939
Others	1.428	.000	4.171	3.136	5.546
Type of family					
Monogamous	0.122	0.059	1.129	0.995	1.281
Polygamous	RC	RC	1.000	RC	RC
Work status					
Not in paid employment	RC	RC	1.000	RC	RC
In paid employment	0.294	0.000	1.342*	1.186	1.519
Marital status					
Never married	RC	RC	1.000	RC	RC
Married/living together	-0.872	0.000	0.418*	0.256	0.682
Widowed/ Divorced/separated	-0.816	0.005	0.442**	0.249	0.787

*significant at 0.1%; ** significant at 1%; ***significant at 5%

In Table 4.8, the variable region singly interacted with current use of contraceptive and women in the North central and north east were 8.4 and 1.8 times significantly more likely to be currently using contraceptive than those in the North west.

TABLE 4.8: Unadjusted Logistic Regression Analysis of Region and Current Contraceptive Use

Region	β	Sig.	Exp(β)	95% C.I for Exp(β)	
				lower	Upper
North central	2.128	0.000	8.394*	6.881	10.240
North east	0.587	0.000	1.798*	1.417	2.281
North west	RC	RC	1.000	RC	RC

*Significant at 0.1%

Using other socio-demographic factors on current use of contraceptive (Table 4.9), the data show striking reduction in the odds ratio of North central (OR=1.392; C.I=1.018-1.639) relative to when the data was not adjusted. Similar patterns of relationship observed between education, residence, wealth quintile, religion, partners education and ever used of contraceptive were also observed for current contraceptive use (see table 4.9).

Age was not significant with current use. Odds for current use increased with increased number of surviving children and a similar pattern was observed for education. Similarly, likelihood rose with increasing levels of wealth quintile. Women in urban areas were more likely to use contraceptive than those in rural areas (OR=1.275 CI=1.055-1.540).

Also, the Yoruba's (OR=5.409; C.I=3.754-795; p<0.0001) and Igbo (OR=3.913; C.I=2.360-6.489; p<0.0001) women living in the North were more likely to be currently using contraceptives than the Hausas/Fulanis. The data further show no significant relationship between religion and current use.

Women in paid employment were more likely to use contraceptive than those who were not. Married women were less likely (OR=0.433; C.I=0.229-0.818; p=0.010) to be currently using contraceptive than their unmarried counterparts.

TABLE 4.9: Adjusted Logistic Regression Analysis of Socio economic and demographic factors and Current Use of Contraceptive

Background Characteristics	β	Sig.	Exp(β)	95% C.I for Exp(β)	
				lower	Upper
Region					
North central	0.256	0.035	1.292***	1.018	1.639
North east	-0.121	0.367	0.886	0.682	1.152
North west	RC	RC	1.000	RC	RC
Age					
15-19	RC	RC	1.000	RC	RC
20-24	0.304	0.077	1.355	0.968	1.897
25-29	-0.010	0.955	1.011	0.703	1.452
30-34	-0.120	0.561	0.887	0.591	1.330
35-39	-0.094	0.670	0.910	0.591	1.402
40-44	-0.216	0.355	0.805	0.509	1.274
45-49	-0.397	0.133	0.672	0.411	1.098
Living children					
0	RC	RC	1.000	RC	RC
1-2	0.543	.001	1.721**	1.243	2.382
3-4	1.515	.000	4.548*	3.145	6.577
5+	1.801	.000	6.058*	4.009	9.155
Age at marriage					
<15	RC	RC	1.000	RC	RC
15-19	-0.837	0.010	0.433***	0.229	0.818
20-24	0.498	0.293	1.645	0.651	4.158
25-29	-1.083	0.008	0.339**	0.152	0.752
30+	-0.371	0.454	0.690	0.262	1.820

*significant at 0.1%; ** significant at 1%; ***significant at 5%

TABLE 4.9: Adjusted Logistic Regression Analysis of Socio-Economic and Demographic Factors and Current Use of Contraceptive (Cont'd)

Background Characteristics	β	Sig.	Exp(β)	95% C.I for Exp(β)	
				lower	Upper
Education					
No education	RC	RC	1.000	RC	RC
Primary	0.203	0.101	1.225	0.961	1.562
Secondary	0.544	0.000	1.723	1.318	2.252
Higher	0.925	0.000	2.523	1.774	3.587
Place of resident					
Urban	0.243	0.012	1.275***	1.055	1.540
Rural	RC	RC	1.000	RC	RC
Wealth quintile					
Poorest	RC	RC	1.000	RC	RC
Poorer	0.354	0.010	1.424	1.088	1.865
Middle	0.644	0.000	1.904	1.453	2.495
Richer	0.894	0.000	2.444	1.811	3.297
Richest	1.171	0.000	3.226	2.284	4.558
Religion					
Islam	RC	RC	1.000	RC	RC
Christianity	-0.113	0.776	0.893	0.408	1.952
Traditionalist	-0.365	0.346	0.694	0.324	1.484
Others	-0.638	0.098	0.528	0.248	1.126
Ethnicity					
Hausa/Fulani	RC	RC	1.000	RC	RC
Igbos	1.364	0.000	3.913*	2.360	6.489
Yoruba	1.688	0.000	5.409*	3.754	7.795
Others	1.187	0.000	3.278*	2.493	4.308

*significant at 0.1%; ** significant at 1%; ***significant at 5%

TABLE 4.9: Adjusted Logistic Regression Analysis of Socio-Economic and Demographic Factors and Current Use of Contraceptive (cont'd)

Background Characteristics	β	Sig.	Exp(β)	95% C.I for Exp(β)	
				lower	Upper
Type of family					
Monogamous	-0.384	0.000	0.681*	.559	.830
Polygamous	RC	RC	1.000	RC	RC
Work status					
Not in paid employment	RC	RC	1.000	RC	RC
In paid employment	0.356	0.000	1.428*	1.203	1.694
Partners education					
No formal	RC	RC	1.000	RC	RC
Primary	0.333	0.017	1.395***	1.060	1.835
Secondary	0.312	0.025	1.366***	1.039	1.796
Higher	0.643	0.000	1.901*	1.404	2.574
Marital status					
Never married	RC	RC	1.000	RC	RC
Married/living together	-0.837	0.010	0.433***	0.229	0.818
Widowed/ Divorced/separated	-4.650	0.454	0.690	0.262	1.820

*significant at 0.1%; ** significant at 1%; ***significant at 5%

4.6 Childbearing Progression

Table 4.10 presents survivorship and parity progression probabilities by contraceptive use status for women who are at the end of the reproductive age. It reveals that women who had used at least a method of contraception progress at slower rates than those who had never used any form of contraceptive; this was even more among women who had use only a modern method. For example at first parity, about 872 births per 1,000 was recorded for women who had never used any form of contraceptive as against 867 and 860 for those who had used any method and those who have used only a modern method. From parity 3 to parity 4, about 510 births per thousand were estimated for never users as against 498 and 464 for ever users (all methods) and modern method users respectively.

The Table also revealed the parity progression probability of women who have ever used a modern method of contraceptive. Probability of progressing from parity 0 to parity 1 was 0.86. Few women also progressed to parity 12 (0.002).

For women who had used a contraceptive (irrespective of type), the probability of moving from parity 0 to1 was 0.87 while that of moving from parity 12 and beyond was 0.003

In the Table Below, women who never used any form of contraceptive show higher probabilities of progressing to higher order births than other women. Approximately 0.01% progressed to parity 12. The rate of progression was not as gradual as it was for women who had ever used contraceptive and those who had ever used a modern method.

Table 4.10: Cumulative Survival Probabilities, Parity Progression Probabilities of All Women Aged 45-49 in Northern Nigeria.

	Total population											
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9593	0.9911										
1974-1976	0.8286	0.9406	0.9839	0.9963								
1977-1979	0.5380	0.7903	0.9152	0.9763	0.9883	0.9991						
1980-1982	0.3320	0.5081	0.7015	0.8510	0.9539	0.9810	0.9961	0.9988				
1983-1985	0.1753	0.3080	0.4780	0.6282	0.8295	0.9172	0.9676	0.9869	0.9953			
1986-1988	0.0793	0.1721	0.2852	0.4310	0.5930	0.7506	0.8704	0.9447	0.9681	0.9869		
1989-1991	0.0460	0.0820	0.1857	0.2621	0.4237	0.5634	0.0714	0.8086	0.9043	0.9475	0.9743	
1992-1994	0.0233	0.0451	0.0869	0.1536	0.2655	0.3780	0.5010	0.6186	0.7377	0.8272	0.8934	0.9477
1995-1997	0.0120	0.0225	0.0498	0.0772	0.1449	0.2381	0.3164	0.4217	0.5680	0.6740	0.7648	0.8257
1998-2000	0.0033	0.0089	0.0154	0.0320	0.0572	0.0949	0.1513	0.2237	0.3206	0.4092	0.5148	0.6097
2001-2003	0.0007	0.0034	0.0042	0.0095	0.0188	0.0371	0.0590	0.1049	0.1525	0.2057	0.2500	0.3728
2004-2006	0.0000	0.0014	0.0007	0.0029	0.0047	0.0121	0.0098	0.0291	0.0389	0.0657	0.0846	0.1417
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	**0.8712**	**0.7456**	**0.6231**	**0.5071**	**0.3973**	**0.2978**	**0.2104**	**0.1384**	**0.0833**	**0.0441**	**0.0207**	**0.0073**
PPR	**-0.081**											

Table 4.10: Cumulative Survival Probabilities, Parity Progression Probabilities of Women Aged 45-49 in Northern Nigeria (cont'd).

Ever Used Modern Methods												
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9485	0.9948										
1974-1976	0.8505	0.9275	0.9839	0.9944								
1977-1979	0.5722	0.7616	0.9140	0.9664	0.9755							
1980-1982	0.3248	0.6010	0.7258	0.8765	0.9560	0.9722						
1983-1985	0.1701	0.3420	0.5431	0.6911	0.8283	0.9097	0.9590	0.9792				
1986-1988	0.0615	0.2176	0.3065	0.4664	0.6198	0.7847	0.8940	0.9271	0.9365	0.9722		
1989-1991	0.0206	0.0881	0.1882	0.2697	0.4602	0.5833	0.7408	0.8334	0.9048	0.9167		
1992-1994	0.0052	0.0415	0.0645	0.1349	0.2884	0.4097	0.5364	0.6875	0.8412	0.8334	0.8421	0.8571
1995-1997	0.0000	0.0104	0.0629	0.0507	0.1289	0.2570	0.3491	0.5000	0.6508	0.7223	0.7368	0.7142
1998-2000	0.0000	0.0000	0.0000	0.0112	0.0483	0.1042	0.1362	0.2396	0.3651	0.4445	0.6316	0.4285
2001-2003-	0.0000	0.0000	0.0000	0.0000	0.0161	0.0208	0.0681	0.0938	0.2540	0.2222	0.3158	0.2857
2004-2006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0085	0.0313	0.0635	0.0556	0.1053	0.1429
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	0.8600	0.7228	0.5906	0.4641	03483	0.2459	0.1592	0.0910	0.0462	0.0206	0.0071	0.0021
PPR	-0.093	p-value =0.000										

Table 4.10: Cumulative Survival Probabilities, Parity Progression Probabilities of Women Aged 45-49 in Northern Nigeria (cont'd).

Ever Used All Methods												
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9641	0.9815										
1974-1976	0.8324	0.9136	0.9684	0.9872								
1977-1979	0.5090	0.7963	0.8798	0.9763	0.9865							
1980-1982	0.3114	0.5041	0.6836	0.8414	0.9257	0.9783	0.9839					
1983-1985	0.1437	0.3038	0.4368	0.6231	0.8176	0.8913	0.9597	0.9717	0.9872			
1986-1988	0.0599	0.1293	0.2469	0.4239	0.5541	0.7464	0.8549	0.9340	0.9615	0.9500		
1989-1991	0.0149	0.0646	0.1456	0.2698	0.3919	0.5435	0.6855	0.8302	0.8974	0.9334	0.9333	
1992-1994	0.0180	0.0259	0.0443	0.1349	0.2230	0.3913	0.5242	0.6038	0.7436	0.8334	0.8889	0.9143
1995-1997	0.0060	0.0129	0.0190	0.0642	0.1352	0.2392	0.3145	0.4529	0.6154	0.7168	0.7778	0.8286
1998-2000	0.0060	0.0065	0.0000	0.0257	0.0541	0.1015	0.1694	0.2547	0.3590	0.4000	0.5556	0.6286
2001-2003-	0.0000	0.0000	0.0000	0.0064	0.0000	0.5072	0.0403	0.1038	0.1410	0.2500	0.3111	0.4572
2004-2006	0.0000	0.0000	0.0000	0.0064	0.0000	0.0145	0.0081	0.0094	0.0256	0.0500	0.1556	0.2000
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	0.8666	0.7389	0.6147	0.4979	0.3888	0.2853	0.1924	0.1221	0.0671	0.0371	0.0178	0.0033
PPR	-0.093	p-value=0.000										

Table 4.10: Cumulative Survival Probabilities, Parity Progression Probabilities of Women Aged 45-49 in Northern Nigeria (cont'd).

Never use contraceptive												
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9888	0.9916										
1974-1976	0.8543	0.9425	0.9858	0.9975								
1977-1979	0.5590	0.7892	0.9196	0.9766	0.9885	0.9990						
1980-1982	0.3448	0.5116	0.7035	0.8679	0.9575	0.9028	0.9978	0.9986				
1983-1985	0.1848	0.3106	0.4826	0.6413	0.8308	0.8470	0.9698	0.9891	0.9964			
1986-1988	0.0830	0.1779	0.2894	0.4406	0.5978	0.6913	0.8722	0.9470	0.9715	0.9924		
1989-1991	0.0462	0.0844	0.1901	0.2659	0.4278	0.5203	0.7029	0.8261	0.9075	0.9492	0.9779	
1992-1994	0.0239	0.0475	0.0915	0.1589	0.2710	0.3457	0.4966	0.6373	0.7384	0.8274	0.8894	0.9517
1995-1997	0.0127	0.0238	0.0536	0.0811	0.1461	0.2197	0.3150	0.4280	0.5622	0.6676	0.7566	0.8309
1998-2000	0.0030	0.0084	0.0174	0.0343	0.0567	0.0873	0.1469	0.2242	0.3149	0.4087	0.5044	0.5185
2001-2003-	0.0008	0.0031	0.0047	0.0100	0.0204	0.0333	0.0594	0.1073	0.1530	0.1955	0.2345	0.3111
2004-2006	0.0000	0.0008	0.0008	0.0033	0.0044	0.0117	0.0090	0.0321	0.0391	0.0635	0.0664	0.1037
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	0.8718	0.7464	0.6241	0.5081	0.3983	0.2993	0.2125	0.1403	0.0852	0.0449	0.0211	0.0096
PPR	-0.080	p-value=0.000										

Table 4.11 depicts the cumulative survival probabilities, childbearing progression probabilities and contraceptive use among women of childbearing age 15-49 in northern Nigeria. A similar pattern of progression was observed as seen in table 4.10. The childbearing progression Probabilities in all categories decreased with increasing parity. However, ever users of contraceptives (any method) and modern contraceptive users had lower probabilities across all parity.

The probability of progressing from parity 1 to parity 2 among ever users of contraceptive was 0.6 and from parity 2-3 it was 0.43.

Women who have used traditional and folkloric methods recorded a probability of 0.79 from parity 0 to parity 1. While from parity 1 to 2, it was0.6

Table 4.11: Cumulative Survival Probabilities, Parity Progression Probabilities and Contraceptive use Among Women of Childbearing Age 15-49 in Northern Nigeria.

	Total population											
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9954	0.9989										
1974-1976	0.9806	0.9925	0.9976	0.9994								
1977-1979	0.9427	0.9720	0.9873	0.9960	0.9976	0.9998						
1980-1982	0.8977	0.9271	0.9523	0.9757	0.9900	0.9954	0.9989	0.9996				
1983-1985	0.8316	0.8690	0.9054	0.9306	0.9619	0.9799	0.9907	0.9957	0.9982			
1986-1988	0.7564	0.7982	0.8339	0.8732	0.9028	0.9340	0.9602	0.9819	0.9885	0.9941		
1989-1991	0.6798	0.7182	0.7603	0.7925	0.8324	0.8674	0.9012	0.9349	0.9631	0.9754	0.9871	
1992-1994	0.5773	0.6551	0.6551	0.6911	0.7302	0.7652	0.8106	0.8552	0.8838	0.9164	0.9461	0.9709
1995-1997	0.4748	0.5495	0.5495	0.5781	0.6094	0.6482	0.6814	0.7339	0.7864	0.8191	0.8690	0.8934
1998-2000	0.3352	0.3974	0.3974	0.4241	0.4521	0.4678	0.5004	0.5488	0.5850	0.6401	0.6863	0.7264
2001-2003	0.2049	0.2442	0.2442	0.2653	0.2884	0.2971	0.3131	0.3525	0.3793	0.4022	0.4225	0.5084
2004-2006	0.0739	0.0826	0.0894	0.0952	0.1103	0.1121	0.1975	0.1330	0.1488	0.1554	0.1771	0.2130
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	0.7883	0.6054	0.4523	0.3281	0.2293	0.1538	0.0975	0.0574	0.0312	0.0151	0.0065	0.0000
PPR	-0.086	p-value= 0.000										

Table 4.11: Cumulative Survival Probabilities, Parity Progression Probabilities and Contraceptive use Among Women of Childbearing Age 15-49 in Northern Nigeria (cont'd).

Ever- used (all method)												
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9946	0.9994										
1974-1976	0.9828	0.9911	0.9979	0.9992								
1977-1979	0.9468	0.9685	0.9881	0.9941	0.9955							
1980-1982	0.8889	0.9376	0.9574	0.9804	0.9876	0.9925						
1983-1985	0.8277	0.8735	0.9119	0.9348	0.9640	0.9774	0.9868	0.9934				
1986-1988	0.7348	0.8046	0.8413	0.8709	0.9066	0.9427	0.9604	0.9769	0.9759	0.9896		
1989-1991	0.6403	0.7066	0.7581	0.7956	0.8356	0.8687	0.9053	0.9373	0.9578	0.9688		
1992-1994	0.5271	0.5926	0.6413	0.6861	0.7342	0.7750	0.8040	0.8746	0.9217	0.9284	0.9302	0.9688
1995-1997	0.4181	0.4780	0.5217	0.5638	0.5869	0.6421	0.6741	0.7690	0.8133	0.8658	0.8139	0.9351
1998-2000	0.2743	0.3420	0.3846	0.4150	0.4200	0.4638	0.4736	0.5380	0.5904	0.6989	0.7442	0.7812
2001-2003	0.1496	0.1954	0.2273	0.2610	0.2680	0.2705	0.2952	0.3367	0.3856	0.4381	0.4419	0.4687
2004-2006	0.0397	0.0677	0.0762	0.0873	0.0878	0.1073	0.1013	0.1287	0.0964	0.1774	0.1628	0.1875
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	**0.7881**	**0.5964**	**0.4337**	**0.3005**	**0.1996**	**0.1244**	**0.0726**	**0.0381**	**0.0193**	**0.0084**	**0.0035**	**0.0000**
PPR	-0.087	p-value=0.000										

Table 4.11: Cumulative Survival Probabilities, Parity Progression Probabilities and Contraceptive use Among Women of Childbearing Age 15-49 in Northern Nigeria (cont'd)

	Ever used traditional and folkloric method											
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9945	0.9993										
1974-1976	0.9824	0.9906	0.9976	0.9990								
1977-1979	0.9440	0.9519	0.9866	0.9942	0.9949							
1980-1982	0.8879	0.8953	0.9536	0.9788	0.9873	0.9933						
1983-1985	0.8270	0.8339	0.9127	0.9373	0.9621	0.9764	0.9853	0.9926				
1986-1988	0.7301	0.7674	0.8404	0.8737	0.9077	0.9240	0.9559	0.9740	0.9720	0.9877		
1989-1991	0.6338	0.6697	0.7547	0.7965	0.8394	0.8544	0.9021	0.9370	0.9510	0.9630		
1992-1994	0.5216	0.5591	0.6339	0.6850	0.7345	0.7667	0.8141	0.8741	0.9230	0.9259	0.9211	0.9630
1995-1997	0.4144	0.4524	0.5152	0.5557	0.5854	0.6342	0.6859	0.7741	0.8042	0.8642	0.7895	0.9259
1998-2000	0.2724	0.3233	0.3799	0.4081	0.4147	0.4570	0.4809	0.5370	0.6083	0.7037	0.7105	0.7407
2001-2003	0.1493	0.1840	0.2264	0.2576	0.2605	0.2649	0.3027	0.3445	0.3846	0.4568	0.4473	0.4444
2004-2006	0.0396	0.0639	0.0779	0.0868	0.0868	0.1043	0.1074	0.1296	0.0979	0.1852	0.1579	0.1111
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	0.7889	0.5974	0.4343	0.3013	0.2000	0.1241	0.0715	0.0369	0.0186	0.0081	0.0033	0.0000
PPR	-0.087	P-value= 0.000										

Table 4.11: Cumulative Survival Probabilities, Parity Progression Probabilities and Contraceptive use Among Women of Childbearing Age 15-49 in Northern Nigeria (cont'd).

	Ever use modern methods											
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9954											
1974-1976	0 9861	0.9948	0.9938									
1977-1979	0.9677	0.9794	0.9875	0.9925								
1980-1982	0.8986	0.9330	0.9750	0.9851	0.9899	0.9857						
1983-1985	0.8341	0.8609	0.8938	0.9402	0.9695	0.9857	0.9787					
1986-1988	0.7742	0.7990	0.8376	0.8432	0.8879	0.9571	0.9787					
1989-1991	0.6913	0.7371	0.7688	0.7835	0.7961	0.8572	0.9149	0.9688				
1992-1994	0.5715	0.6392	0.6813	0.7014	0.7247	0.7286	0.7021	0.9063	0.9583	0.9333		
1995-1997	0.4563	0.5053	0.5563	0.6343	0.5920	0.6143	0.5532	0.7501	0.9166	0.8667		
1998-2000	0.2996	0.3660	0.4063	0.4701	0.4591	0.4572	0.4043	0.5625	0.5416	0.6666	0.8333	
2001-2003	0.1613	0.2631	0.2375	0.2910	0.3362	0.2858	0.2128	0.2813	0.4166	0.3333	0.3333	0.6000
2004-2006	0.0415	0.0773	0.0625	0.0895	0.1225	0.1143	0.0426	0.1250	0.1250	0.1333	0.1667	0.6000
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	7822	0.5894	0.4285	0.2947	.1958	0.1259	0.0799	0.0480	0.0250	0.0110	0.0050	0.0000
PPR	-0.086	p-value=0.000										

Table 4.11: Cumulative Survival Probabilities, Parity Progression Probabilities and Contraceptive use Among Women of Childbearing Age 15-49 in Northern Nigeria (Cont'd).

	Never use any contraceptive method											
Year of birth	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
1971-1973	0.9956	0.9988										
1974-1976	0.9803	0.9927	0.9976	0.9974								
1977-1979	0.9421	0.9725	0.9872	0.9962	0.9979	0.9998						
1980-1982	0.8991	0.9253	0.9501	0.9749	0.9904	0.9959	0.9987	0.9996				
1983-1985	0.8322	0.8683	0.9031	0.9299	0.9616	0.9801	0.9916	0.9960	0.9980			
1986-1988	0.7599	0.7972	0.8316	0.8750	0.9023	0.9324	0.9606	0.9826	0.9899	0.9946		
1989-1991	0.6862	0.7203	0.7595	0.7947	0.8319	0.8670	0.9010	0.9341	0.9637	0.9761	0.9860	
1992-1994	0.5856	0.6291	0.6569	0.6062	0.7296	0.7635	0.8124	0.8526	0.8796	0.9153	0.9479	0.9710
1995-1997	0.4997	0.5211	0.5540	0.5865	0.6132	0.6489	0.6832	0.7284	0.7833	0.8143	0.8738	0.8947
1998-2000	0.3562	0.3746	0.3994	0.4341	0.4574	0.4683	0.5045	0.5505	0.5841	0.6341	0.6814	0.7263
2001-2003-	0.2208	0.2327	0.2470	0.2767	0.2918	0.3010	0.3159	0.3546	0.3788	0.3985	0.4209	0.5131
2004-2006	0.0820	0.0851	0.0917	0.1099	0.1141	0.1128	0.1178	0.1336	0.1548	0.1531	0.1784	0.2158
2007-2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PPP	0.7884	0.6069	0.4554	0.3326	0.2341	0.1587	0.1017	0.0606	0.0332	0.0162	0.0070	0.0000
PPR	-0.086	p-value= 0.000										

4.7 Adjusted Total Fertility Rate

The data as shown in Table 4.12 show that the adjusted total fertility rate for northern Nigeria was 7.6 children per woman. This means that at the prevailing age specific fertility rate. a woman in northern Nigeria is expected to have approximately eight (8) children at the end of her reproductive age. The data also depict that the adjusted Total Fertility Rate for women who had ever used any form of contraceptive method in northern Nigeria was 5.8 while for never users; it was about 8 children per woman. TFR for women who had used a modern contraceptive was 5.3. the adjusted TFR for folkloric and traditional method users was the highest 8.8.

The P/F ratio for ever users of contraceptive reveal some age error. There was a gross over statement of age between age group 15-19(1.40) and age group 40-44 (1.44). There were also age understatement of age at ages 20-24 (0.77) and 25-29 years (0.88)

Content error of age over statement was revealed at all age groups among women who had ever used folkloric and traditional methods of contraceptive. Among those who have ever used a modern method, errors were largely in ages 15-19 (p/f ratio = 1.3052) and ages 20-24 (p/f ratio =0.75).

Table 4.12: Period and Adjusted Fertility Rates According to Contraceptive Use Status, NDHS, 2008.

Total Population

1	2	3	4	5	6	7	8	9	10	11
Age group	CEB	Births 1-year	FP(i)	p(i)	f(i)	Θ(i)	F(i)	.f'(i)	P/F	.f*(i)
15-19	1124	475	3193	0.3833	0.1491	0.7455	0.3375	0.1739	1.1357	0.1724
20-24	5237	986	3169	1.6589	0.3115	2.3030	1.6690	0.3176	0.9940	0.3149
25-29	10199	1002	3200	3.8187	0.3131	3.8685	3.2416	0.3147	0.9832	0.3121
30-34	11377	740	2361	4.8187	0.3130	5.4335	4.8304	0.3101	0.9976	0.3075
35-39	12043	477	1948	6.1854	0.2450	6.6585	6.1900	0.2371	0.9993	0.2351
40-44	11371	234	1619	7.0191	0.1444	7.3805	7.0254	0.1320	0.9991	0.1091
45-49	11771	119	1541	7.6386	0.0772	7.7667	7.6753	0.0679	0.9952	0.0673
Total					**1.5533**			**1.5533**		**1.5184**
			Total fertility rate.....							**7.592**

Table 4.12: Period and Adjusted Fertility Rates According to Contraceptive Use Status, NDHS, 2008 (Cont'd).

Ever-used All Methods

1	2	3	4	5	6	7	8	9	10	11
Age group	**CEB**	**Births 1-year**	**FP(i)**	**p(i)**	**f(i)**	**Θ(i)**	**F(i)**	**.f'(i)**	**P/F**	**.f*(i)**
15-19	83	25	109	0.7615	0.2294	1.1470	0.5443	0.2611	1.3991	0.2239
20-24	543	100	355	1.5296	0.2817	2.5555	1.9900	0.2769	0.7686	0.2374
25-29	1428	129	480	2.9750	0.2688	3.8995	3.3666	0.2700	0.8837	0.2315
30-34	1678	102	386	4.3472	0.2643	5.2210	4.7254	0.2612	0.9200	0.1973
35-39	1852	60	326	5.6810	0.1841	6.1415	5.7958	0.1754	0.9802	0.1504
40-44	1668	25	249	6.7100	0.1004	6.6435	6.4312	0.0925	1.4335	0.0793
45-49	1308	7	176	7.4318	0.0398	6.8425	6.7956	0.0320	1.0936	0.0274
Total					1.3685			1.3691		1.1668
			Total fertility rate.....							5.836

Table 4.12: Period and Adjusted Fertility Rates According to Contraceptive Use Status, NDHS, 2008 (Cont'd).

Ever-used All Methods										
1	2	3	4	5	6	7	8	9	10	11
Age group	**CEB**	**Births 1-year**	**FP(i)**	**p(i)**	**f(i)**	**Θ(i)**	**F(i)**	**.f'(i)**	**P/F**	**.f*(i)**
15-19	83	25	109	0.7615	0.2294	1.1470	0.5443	0.2611	1.3991	0.2239
20-24	543	100	355	1.5296	0.2817	2.5555	1.9900	0.2769	0.7686	0.2374
25-29	1428	129	480	2.9750	0.2688	3.8995	3.3666	0.2700	0.8837	0.2315
30-34	1678	102	386	4.3472	0.2643	5.2210	4.7254	0.2612	0.9200	0.1973
35-39	1852	60	326	5.6810	0.1841	6.1415	5.7958	0.1754	0.9802	0.1504
40-44	1668	25	249	6.7100	0.1004	6.6435	6.4312	0.0925	1.4335	0.0793
45-49	1308	7	176	7.4318	0.0398	6.8425	6.7956	0.0320	1.0936	0.0274
Total					1.3685			1.3691		1.1668
			Total fertility rate.....							**5.836**

Table 4.12: Period and Adjusted Fertility Rates According To Contraceptive Use Status, NDHS, 2008 (Cont"d).

Ever used-traditional and folkloric method										
1	2	3	4	5	6	7	8	9	10	11
Age group	CEB	Births 1-year	FP(i)	p(i)	f(i)	Θ(i)	F(i)	.f (i)	P/F	.f*(i)
15-19	5	0	9	0.5556	0.0000	0.0000	0.0471	0.0123	11.7962	0.0168
20-24	64	15	46	1.3913	0.3261	1.6665	1.0336	0.3471	1.3760	0.4728
25-29	175	12	50	3.5000	0.2400	2.8430	2.3655	0.2350	1.4796	0.3201
30-34	225	13	51	4.4118	0.2549	4.1430	3.5846	0.2628	1.2308	0.3580
35-39	191	11	37	5.1622	0.2973	5.6710	5.1430	0.2964	1.0037	0.4037
40-44	195	3	30	6.5000	0.1000	6.1885	5.9321	0.0920	1.0957	0.1253
45-49	140	1	19	7.3684	0.0526	6.3545	6.4043	0.0478	1.1505	0.0651
Total					1.2709			1.2934		1.7618
			Total fertility rate.....							8.809

Table 4.12: Period and Adjusted Fertility Rates According to Contraceptive Use Status, NDHS. 2008 (Cont'd).

Ever used-Modern Method										
1	2	3	4	5	6	7	8	9	10	11
Age group	CEB	Births 1-year	FP(i)	p(i)	f(i)	Θ(i)	F(i)	.f(i)	P/F	.f*(i)
15-19	78	25	100	0.78	0.25	1.2500	0.5976	0.2831	1.3052	0.2280
20-24	479	85	309	1.15502	0.2751	2.6255	2.0668	0.2689	0.7493	0.2166
25-29	1253	117	430	2.9140.	0.2721	3.9860	3.4467	0.2452	0.8455	0.1975
30-34	1453	89	335	4.3373	0.2657	5.3145	4.4942	0.2379	0.9651	0.1916
35-39	1661	49	289	5.7474	0.1696	6.1625	5.8386	0.1635	0.9844	0.1317
40-44	1473	22	219	6.7260	0.1005	6.6650	6.4565	0.0929	1.0417	0.0748
45-49	1168	6	157	7.4400	0.0382	6.8580	6.8110	0.0305	1.0924	0.0246
Total					1.3712			1.3220		1.0648
			Total fertility rate.....							5.324

Table 4.12: Period and Adjusted Fertility Rates According to Contraceptive Use Status, NDHS, 2008 (Cont'd)

Never-used –anymethod										
1	2	3	4	5	6	7	8	9	10	11
Age group	CEB	Births 1-year	FP(i)	p(i)	f(i)	Θ(i)	F(i)	.f'(i)	P/F	.f*(i)
15-19	1141	451	3084	0.3700	0.1462	0.7310	0.3300	0.1705	1.1212	0.1694
20-24	4694	887	2814	1.6681	0.3152	2.3070	1.6595	0.3229	1.0050	0.3207
25-29	8771	893	2720	3.2246	0.3281	3.9475	3.2922	0.3298	0.9800	0.3276
30-34	9699	637	1975	4.9109	0.3227	5.5610	4.9366	0.3190	0.9948	0.3169
35-39	10191	417	1622	6.2830	0.2573	6.8475	6.3548	0.2501	0.9887	0.2484
40-44	9703	209	1370	7.0825	0.1523	7.6090	7.2330	0.1390	0.9792	0.1381
45-49	10463	112	1365	7.6650	0.0820	8.0190	7.9221	0.0725	0.9676	0.0720
Total					1.6038			1.6038		1.5931
			Total fertility rate.....							7.9655

as figure 4.2, women who never used any form of contraceptive had higher Fertility rates across all childbearing age groups than those who had ever used.

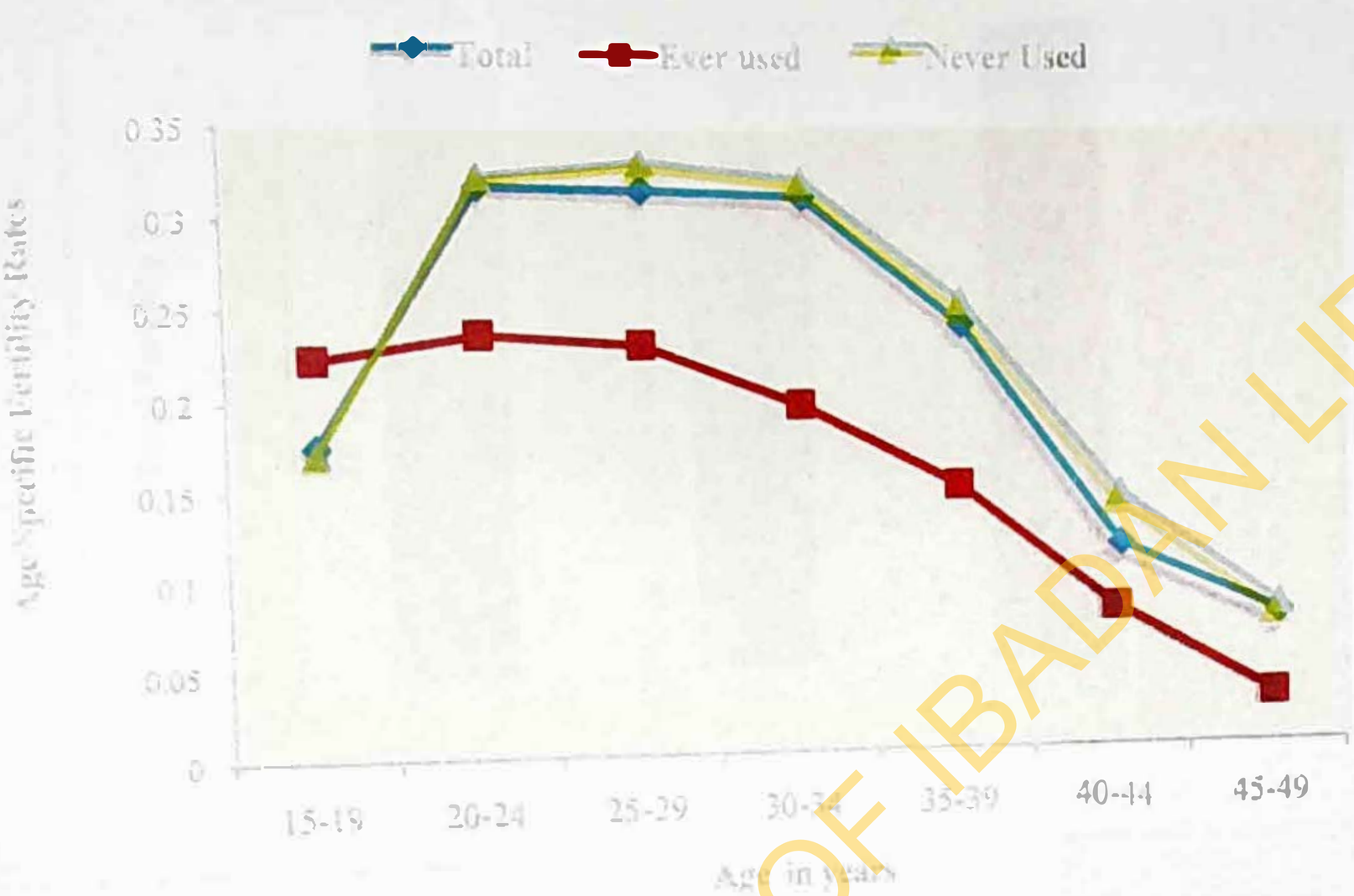

FIGURE 4.2 Adjusted Age Specific Fertility Rate for Women in Northern Nigeria,

Figure 4.3 Represent Adjusted TFR for all women by contraceptive use in northern Nigeria. Women who Ever used a method had the lowest TFR of 5.8

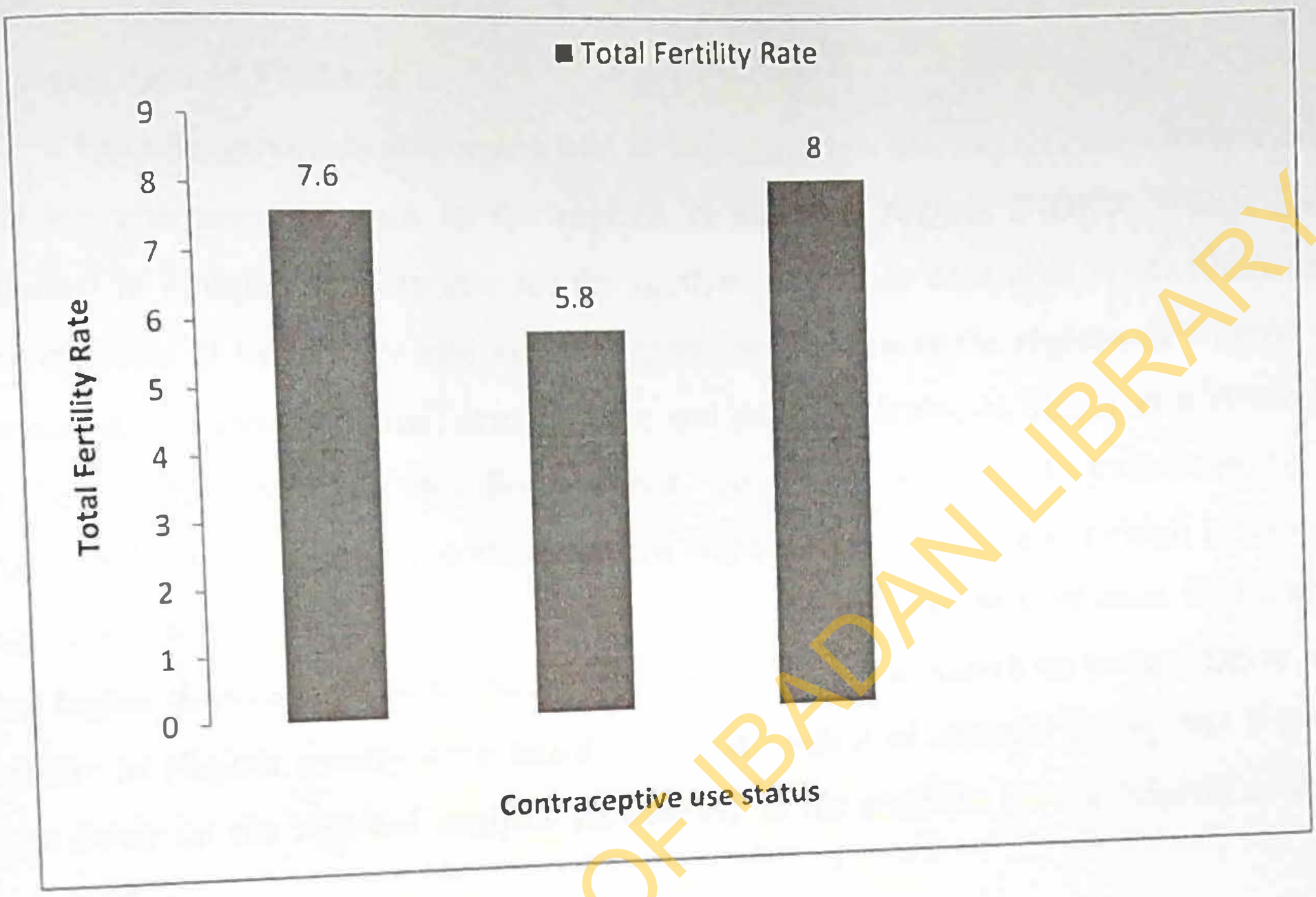

FIGURE 4.3 Adjusted Total Fertility Rate for All women By Contraceptive Use in Northern Nigeria

CHAPTER FIVE

DISCUSSION

5.1 Discussion of Findings

Contraceptive use prevalence rate in Nigeria is low and the national estimate is higher than the estimates for each of the regions in northern Nigeria (NDHS, 2008). This was reflected in a higher fertility rate for the northern region as compared to the National TFR. The differential in fertility rate and contraceptive use across the regions in Nigeria reflect variations in socio-economic, demographic and cultural ideologies of different ethnic groups in the country (NPC, 2006). For instance, poor attitudes towards contraceptive use in Northern Nigeria compared to the Southern Nigeria have been linked to high fertility in the region. Consequently, the births progression in the North as a result of short birth interval is also higher than that of the South (Fayehun et al, 2011). Research on contraceptive use and fertility in Nigeria mostly were based on the utilization of national survey but few studies have dwelt on the regional analysis particularly in the northern part of Nigeria as found in current study.

This study reveals several important information regarding childbearing progression and contraceptive use in northern Nigeria. Analysis of the demographic profile of the women included in this study show that the median age of the respondents was 28years and age group 25-29 has the largest representation (20.5%). More than 84% of the respondents have at least a surviving child. Majority of the respondents werre married and there were more rural residents than urban which reflects rural urban composition in Nigeria. Although, the demographic profile of the women found in this study is similar to the true situation in Nigeria (Odimegwu et al, 1997; Orji and Onwudiegwu, 2002; Oyedokun 2007, Adebowale et al, 2011(a)).

Past studies have shown that contraceptive use is low in Nigeria despite its high population and this reflects in the high growth rate which the country is experiencing in the recent time (Monjok et al, 2011; Abiodun and Balogun, 2009; Oye-Adeniran et al, 2004;

Fawole and Aboyeji, 2002; Population Reference Bureau, 2012). The findings from these studies are in agreement with the current study where low contraceptive use was found. The reported prevalence of both current (7.2%) and ever use (13.3%) of contraceptives is low, but this was slightly higher than the use of modern methods, where 6.1% and 11.7% were found to be currently using and ever used modern methods respectively. The low prevalence of current and ever use of modern contraceptive in northern Nigeria can be attributed to low level of education and Islamic religion dominance in the population of women in northern Nigeria. These variables have been identified as part of determinants of contraceptive use in northern and other parts of Nigeria (Duze and Mohammed, 2006; Ibisomi, 2009, Odimegwu et al, 1997).

Women resident in the north central zone, urban areas, in monogamous homes, with higher education, in the richest wealth quintile, never married and in paid employment were found to have ever used and are currently using contraceptive more than their counterparts in other subgroups. These findings are similar to the outcome of previous studies conducted in Nigeria where the same pattern was observed (Adebowale et al, 2011(b); Odimegwu et al. 1997). The reason for the differential could be as a result of more developmental programme that could facilitate the use of contraceptive in the urban than rural areas. Also, the north central zone consists of women from other ethnic groups in Nigeria in high proportion particularly the Yorubas who are known to be more educated and use contraceptive than women from other ethnic groups in Nigeria (NDHS, 2008; Adebowale et al, 2011 (a)). These set of women are adequately represented in the north central zone of Nigeria (National Population Commission, 2007). In Nigeria, contraceptive is not free most especially the commonly used method (condom). It is therefore not impossible that women from wealthier homes are more likely to find it easier to acquire it when needed than their counterparts from poorer homes.

Other identified socioeconomic and demographic factors influencing current contraceptive use in this study were; education, ethnicity, wealth index, marital status, partners education, type of family, age at first marriage and number of living children. Education has been established as an important factor associated with the use of contraceptives especially modern method as it prevails over cultural and some religious

myths (Bbaale, 2011; Bongaarts, 2010). This shows that increasing the level of education of women preferably will help in advancing family planning acceptance and contraceptive use in northern Nigeria.

This study further revealed that women residing in the central part of northern Nigeria were more likely to have ever used any method of contraceptive than their counterparts in the eastern and western zones after controlling for other factors. This pattern was also observed for current use. This finding is consistent with the outcome of other studies in Nigeria (NDHS, 2003; Oye-Adeniran et al, 2006; NDHS, 2008). It could be argued that higher literacy rate and utilization of family planning programmes which are higher in the north central would explain this differential. There are also higher proportions of Christians in the north central part of Nigeria compared to other regions in the north which are predominantly Muslims. Studies have found higher use of modern contraceptive among Christians than Muslims (Agadjanian et al, 2009; Oye-Adeniran et al, 2006). Urban residents had a higher probability to have ever used and to be currently using contraceptive than their rural counterparts. This trend could be attributed to the fact that family planning services and the influence of media are more prominent in the urban centres than the rural areas. This is finding is in agreement with the studies previously conducted by Orji and Onwudiegwu, 2002; Adebowale et al, 2011(a), where current and ever use of contraceptive were reported to be higher in the urban than the rural.

For ethnicity, all the other tribes were more likely to be using contraceptive than the Hausas/ Fulani and this may be due to the fact that the Hausas are known as a tribe that support large family sizes as suggested by a previous study by Duze and Mohamed in kano(Duze and Mohamed, 2006). This may have resulted in the low usage of contraceptive by the Hausa/ fulanis in this study.

The results also showed that the likelihood of using a contraceptive increases as the wealth quintile rose. Two similar studies in Cameroun found the same pattern and emphasized that there was a big gap in modern contraceptive prevalence between the absolute poor and the rest of the population (Ekani-Bessala et al, 1998; Gakiodou and Vayena, 2007). This is likely due to difficulties in relating income to both the demand for and also the supply of contraceptive services. This gap in contraceptive use could be getting

larger, because as national income per capita rises, the gap in income between the rich and the absolute poor is also rising hence, the poor may not be able to afford modern contraceptive as it is not totally free in Nigeria (Adebowale et al, 2011(b)).

This study found the likelihood of using contraceptive to be higher among unmarried women than any other marital status categories. This finding did not correspond to that of a recent study carried out in Kenya where the married significantly use contraceptive than those in the other categories (Okech et al, 2011). Therefore, one may be tempted to argue that women who had not married but sexually active will use contraceptive more than the married as children born outside wedlock are not often recognized as legitimate in Nigerian context.

The higher the number of living children the more likely it is to use contraceptive. Consistent with other studies, this positive influence of the number of living children on the likelihood of using contraceptive could be attributed to the likelihood that the woman's desire for having children has been satisfied. (Mahidu et al, 1998). It is natural that only after a couple has been able to bear at least a child that they may consider using a contraceptive method to avoid getting pregnant in a short time.

The reproductive patterns of women in the northern part of Nigeria overtime makes it is imperative to know the process of family dynamics as to how many women are moving from lower order parity to higher order parity. This was assessed through the Parity Progression probabilities and Ratios (Bhardwaj et al. 2010). The Parity Progression probabilites for all women irrespective of their contraceptive use status revealed that there was no obvious inclination to any particular parity as revealed in the probabilities from the results in this study. This prompts the tentative conclusion that there is no socially sanctioned 'optimum number' of children among women of childbearing age in northern Nigeria. If there was, the ratios would have indicated that the vast majority of women would progress to that parity. This is unlike the findings in more advanced societies (Frejka and Sardon, 2006).

The PPRs also suggest that few women terminate their childbearing relatively at low parities (parity 4 as recommended in 1988 Nigeria population policy). Also, the probability of progressing to a further birth diminishes with each child born and an ever-diminishing proportion of women progress to subsequent parity. This pattern is consistent with finding

of two similar studies in India (Bhardwaj et al, 2010; Yadava and Kumar, 2011), although a different approach was used in calculating the PPR.

To check the effect of contraception on Parity Progression, this study further looked at the pattern of PPR according to contraceptive use status. The study revealed that never users had a tendency to progress to higher order births than ever users. For example, from parity 0 to parity 1, the PPP for never users of contraceptive was 0.8718 as against 0.8666 for ever users. This probability was even lower among ever users of modern contraceptive. Generally, the probability of progression to higher parities decreased with increasing parity. However, this decrease was gradual for all women except modern contraceptive users. The drastic decrease in PPRs of modern contraceptive users may be explained by the fact that modern contraceptives methods are more efficacious for spacing or limiting births.

The adjusted TFR for contraceptive users was lower than for non users, this difference is over 2.1 and was even more evident (2.7) for those women who never used modern contraceptive. The fertility rate in northern Nigeria is very high even among women who had ever used contraceptive. Those who had ever used contraceptive may probably be doing so more to delay rather than limiting birth. Those women who had used traditional and folkloric methods had the highest adjusted TFR. This could lead one to conclude that these methods of contraceptive are less effectual towards spacing and or limiting births.

The P/F ratios compare lifetime fertility with current fertility and are a check on the quality of the data. If only the data were perfect and fertility unchanging, the ratios would be very close to unity (one) at all ages. However, increasing ratios point to declining fertility which is a usual trend in countries like South Africa where the proportion of women having another birth is falling (Moultrie and Timaeus, 2002). In this study, there is no consistency in this regard as at some age cohorts, the ratios are decreasing rather than increasing.

Also data errors are identifiable if the ratios in a given cohort deviate markedly from the trend in surrounding cohorts. Among ever users, the ratio of 15-19 cohorts was high. The absence of similar errors in the other age cohorts up to 40-44 cohort lends further weight to the conclusion that the 2008 NDHS data for this age-group are distorted by ever users aged 15-19 reporting their age as 20-24. The fall in the ratio at 45-49 cohorts also indicates a distortion as some in this cohort may have reported their ages as 40-44. Among never users.

the ratios were decreasing until 30-34 years age cohort where some increase were found and afterwards the ratio continued to decrease. This is an indication of age error by women aged 30-34 years who perhaps must have reported their ages as 35-39 years during the survey. These age errors are similar to the ones found in the South Africa DHS of 1998 (Moultrie and Timaeus, 2002).

5.2 CONCLUSION

Education, Region, ethnicity, wealth index, and living children are the major correlates of contraceptive use, both ever use and current use. Women resident in the north central zone, urban areas, in monogamous homes, with higher education, in the richest wealth quintile, never married and in paid employment werefound to have ever used and are currently using contraceptive more than their counterparts in other subgroups.

Contraceptive use in northern Nigeria is very low and the rate of childbearing is high even among women who ever used contraceptive. The use of contraceptive (especially modern methods) however has some positive influence on PPR and TFR as the ratios remained lower for women who ever used any and modern contraceptive method. The strategies put in place in northern Nigeria to improve contraceptive use appear not to have impacted much on the people in the region.

This study concludes that there is no socially sanctioned 'optimum number' of children among women of childbearing age in northern Nigeria since the Parity Progressin probabilites did not show any obvious inclination to any particular parity. This explains the tendency to higher TFR and progression to higher parities in Northern Nigeria. However contraceptive use in the study was significantly associated with lower TFR and the probability to progress to higher parities.

The demonstrated positive effect of modern contraceptive use in lowering TFR and the tendency to progress to higher parities as observed in this study make a strong case for the use of modern contraceptives in improving maternal and child health indices in Nigeria, the central goals of MDG 4 and 5. This calls for intensified family planning intervention programmes in the northern part of Nigeria.

5.3 RECOMMENDATION

a) The use of modern contraceptive should be aggressively advocated through health education campaign. Intensifying campaigns on the use of modern methods of contraceptive may therefore be of immense importance for promoting small but a healthy family size and hence achieving MDG 4 and 5.

b) Efforts should be made to overcome barriers to the use of modern contraceptives among women in Northern Nigeria. This should include policies to address education, communication gaps, religious and cultural beliefs and access to modern contraceptives.

c) Government agencies and Nongovernmental organizations who drive the campaigns of contraceptive use should conscious of rural-urban differentials in contraceptive use and reproductive health indices. Therefore strategies to carry the rural areas along should be designed.

d) Education of the girl child should be given more priority by the government particularly in northern Nigeria. Incentives like free education should be made available to communities to encourage girl child education.

e) Empowering women particularly in northern Nigeria is pivotal in ensuring modern contraceptive use. Economic Empowerment programmes geared at improving wealth index of women particularly in rural areas should be pursued vigorously at all levels of governments- Federal, State and Local government in northern Nigeria.

f) Modern contraceptives should be made more affordable and accessible for instance, by government policies to encourage their widespread use in northern Nigeria.

g) Government should formulate workable population policy that promotes modern contraceptive use, smaller family size and healthier family.

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APPENDIX I

MAP OF NIGERIA HIGHLIGHTING THE NORTHERN REGION

Source: Wikipedia

APPENDIX II

COEFFICIENTS FOR INTERPOLATION BETWEEN CUMULATED FERTILITY RATES TO ESTIMATE PARITY EQUIVILENT

TABLE 7. COEFFICIENTS FOR INTERPOLATION BETWEEN CUMULATED FERTILITY RATES TO ESTIMATE PARITY EQUIVALENTS

Age group (1)	Index i (2)	Equation No. (3)	Coefficients a(i) (4)	b(i) (5)	c(i) (6)
(a) *Fertility rates calculated from births in a 12-month period by age of mother at end of period*					
15-19-40-44	1-6	B.2	3.392	−0.392	-
45-49	7	B.3	0.392	2.608	-
15-19	1	B.4	2.531	−0.188	0.0024
20-24	2	B.4	3.321	−0.754	0.0161
25-29	3	B.4	3.265	−0.627	0.0145
30-34	4	B.4	3.442	−0.563	0.0029
35-39	5	B.4	3.518	−0.763	0.0006
40-44	6	B.4	3.862	−2.481	−0.0001
45-49	7	B.4	3.828	0.016[a]	−0.0002
(b) *Fertility rates calculated from births by age of mother at delivery*					
15-19-40-44	1-6	B.2	2.917	−0.417	-
45-49	7	B.3	0.417	2.083	-
15-19	1	B.4	2.147	−0.244	0.0034
20-24	2	B.4	2.838	−0.758	0.0162
25-29	3	B.4	2.760	−0.594	0.0133
30-34	4	B.4	2.949	−0.566	0.0025
35-39	5	B.4	3.029	−0.823	0.0006
40-44	6	B.4	3.419	−2.966	−0.0001
45-49	7	B.4	3.535	−0.007[a]	−0.0002

[a] This coefficient should be applied to $f(i-1)$, not $f(i+1)$, that is, to $f(6)$ instead of $f(8)$.