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Analysis of fertility dynamics in Nigeria: exploration into fertility preference implementation

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CHAPTER 1

GENERAL INTRODUCTION

1.0. INTRODUCTION

Fertility transition is obviously on in Sub-Saharan Africa although fertility rates in the region are still considerably higher than in any other regions of the world (Cohen, 1993; Mboup and Saha, 1998; Makinwa-Adebusoye, 2001). The transition is however not uniform in the region as there is wide variation in the fertility rates among the countries. For instance, the demographic and health surveys (DHS) conducted between 1998 and 2003 shows that: total fertility rate (TFR) was 2.9 in South Africa; 4.0 in Zimbabwe; 4.4 in Ghana; 5.7 in Nigeria and 6.8, 6.9 and 7.2 in Mali, Uganda and Niger respectively (Measuredhs, 2007).

The region's growth rate is 2.6% per annum and accompanied by a decline in economic growth. This is perceived not to be a good prospect for sustainable development in the region (World Bank, 1994; USAID, 2004). An encouraging trend however has been the strengthening of political commitment to population-related policies and family planning programmes by many of the governments (UNFPA, 2004). This has the potential to catalyse fertility transition and allow the balancing and integration of population issues with other development-related ones.

The revised National Policy on Population for sustainable Development in Nigeria (2004) takes into account the 1994 International Conference on Population and Development

(ICPD) Programme of Action (UNFPA, 2007). The overall goal of the policy is the improvement of the quality of life and the standards of living of the people of Nigeria. Some of the specific goals include: (1) progress towards a complete demographic transition to reasonable birth rates and low death rates (2) to expand access and coverage and improve the quality of reproductive and sexual health care services to all Nigerians at every stage of the life cycle (3) to enhance the involvement of men in reproductive health programmes and health care (4) to use effective advocacy to promote and accelerate attitudinal change towards population and reproductive health issues (Federal Government of Nigeria, 2004).

National policies on reproductive health, HIV/AIDS, women, and youth exist in the country and programmes (such as the National Economic Empowerment and Development Strategy (NEEDS) to eradicate poverty) are further being developed to operationalise the policies at both national and local levels. Development partners are also supporting the government in building technical capacity for the operationalisation of the various policies. For instance, the United Nations Population Fund (UNFPA) is engaged in advocacy and policy dialogue to mobilize support for population programme, including the improvement of reproductive health services. The body is also supporting the implementation of existing reproductive health and rights policies (UNFPA, 2007).

In Nigeria as in most Sub-Sahara African countries, fertility has been declining since the mid 1970s (Feyisetan & Bankole, 2002). However, little is known about the dynamics of the factors that have brought about the change. This study examines fertility dynamics in

Nigeria between 1990 and 2003 with a view to knowing whether and how socio-economic changes have affected it in the last decade. The study gives an overview of the levels, trend, differential and proximate determinants of fertility during the period. It specifically estimates the extent to which people have been able to implement their fertility preferences in the country as well as the contribution of this to fertility changes within the period. How couples' attitudes and preferences impact on each other towards achieving desired fertility preferences is also examined.

1.1. PROBLEM STATEMENT

Fertility studies in Nigeria date back to decades and have examined a wide range of topics on fertility. These include trends, determinants and differentials; adolescent's reproductive health; family planning; abortion; poverty and fertility dynamics; reproductive intention, reproductive decision-making, spousal influences on reproductive issues and a host of others. Most of these studies however are at local geographical areas.

As in most good researches, a number of issues could be identified from these studies. One of these is the discrepancy observed between actual and wanted fertility in Nigeria. For example, wanted fertility declined from 5.8 in 1990 to 4.8 in 1999 while actual fertility fell from 6.0 to 5.2 during the same period (Macro DHS, 1990; NDHS, 2000). This differences point to the fact that there is some degree of unwanted fertility in the country, which in effect means that women have not been able to translate their fertility preferences into reality. In addition, the country has passed through a number of socio-economic and political changes in the last quarter of a century that could have influenced her demography.

Against this backdrop, the questions arising are: What are the actual levels, trends and differentials of fertility preference and outcome in Nigeria? To what extent and in what context is fertility preference achieved in Nigeria and how have socio-economic changes and development in the country impacted on these fertility issues? Answers to these questions should provide a greater and better insight into associated social, cultural, economic, political, and other factors that influence fertility dynamics in Nigeria.

1.2. RESEARCH OBJECTIVES

1.2.1. GENERAL

This study aims to analyse the levels, trends and differentials in fertility preference and behaviour and the extent of achievement of fertility preference in Nigeria.

1.2.2. SPECIFIC

1. To examine the levels, trends and differentials in fertility behaviour in Nigeria between 1990 and 2003.
2. To identify the order of influence of the proximate determinants of fertility in Nigeria between 1990 and 2003.
3. To estimate the levels, trends and differentials in fertility preference implementation in Nigeria between 1990 and 2003.
4. To estimate the contribution of the determinants of fertility to actual fertility changes between specified periods in Nigeria.
5. To examine how couples' attitudes and preferences impact on each other towards achieving individual fertility preferences.

6. To explore how and the context within which people have been achieving their fertility preferences in Nigeria.

1.3. JUSTIFICATION FOR THE STUDY

Various international conferences on population and development, family planning and reproductive health have recommended Programme of Action and set targets for achieving sustainable fertility patterns worldwide. For example, the World Population Conference held at Bucharest in 1974, the 1981 International Conference on Family Planning held in Jakarta, Indonesia; the 1984 Mexico and the 1994 Cairo International Conferences on Population and Development (ICPD) and recently the Millennium Summits reaffirmed 'the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning, as well as other methods of their choice for regulation of fertility which are not against the law' (UNFPA, 2004). Nigeria is one of the countries that participated in the fora and adopted the Programme of Action.

Arising from these conferences are various policy formulations. Nigeria has operated a population policy since 1988, which was recently revised in 2004. The recent revision is targeted: to achieve a reduction of the national annual population growth rate to 2% or lower by the year 2015, to achieve a reduction in the total fertility rate of at least 0.6 children every five years and to increase the modern contraceptive prevalence rate by at least 2% points per year.

However, despite the various recent robust national data sets in Nigeria (NDHS 1990, 1999 and 2003 and the 1991 population census), information available on population dynamics in Nigeria has been largely limited to reports of these surveys. Few known studies have also been done within a theoretical context to quantify the determinants of fertility or other fertility measures in the country at the national level. Thus, the impact of the various efforts by the government to implement or achieve the set objectives at the various international meetings on population in the promotion of demographic behaviour remains a matter of conjecture in Nigeria demographic discourse.

This study is particularly relevant in the face of social and economic changes that have been taking place in Nigeria in the last couple of decades as the only two known national study within a theoretical context on fertility in the country are those by Adegbola (1987) and Makinwa-Adebusoye and Feyisetan (1994), which are over two decades and a decade old respectively. A comprehensive analysis of levels, trends and differentials in fertility preference and behaviour as well as how and the extent to which couples and individuals are able to implement their fertility preferences will add to the body of knowledge on fertility and reproductive health issues in Nigeria. It will also be an indicator of the extent to which available reproductive health programs and services in the country have assisted couples and individuals to achieve their fertility preferences. These should assist the government as well as reproductive health programmers in designing appropriate and/or fortifying existing programmes with the aim of improving the level at which people achieve their fertility preferences and towards the country achieving the set targets.

1.4. BRIEF BACKGROUND OF STUDY AREA

Nigeria came into existence as a nation state in 1914 through the amalgamation of the Northern and Southern protectorates with the colony of Lagos. It is located on the coast of West Africa and is bordered by the republics of Benin, Cameroon, Chad and Niger. It covers a land area of 923,768 square kilometres and is the fourth largest country in Africa by area (NDHS, 2003). It is however the most populous with about 140million inhabitants (Demography Matters, 2006; Guardian, 2007). Presently, the country as a federation is divided into 36 states and a federal capital territory (Abuja, which became the administrative capital of the country in 1991).

Nigeria got full independence in October 1960, as a federation of three regions and proclaimed itself a federal republic in October 1963. The federal military government assumed power in 1966 and the country did not return to civilian rule until 1979. The military re-established itself in December 1983 and four different Heads of state governed the country until a democratic Nigeria emerged again in May 1999. The sixteen years of consecutive military misrule was interspersed by a number of events. These include the historic June 12, 1993 presidential election, which was deemed to be Nigeria's fairest election by most observers. However, the then head of state annulled the election, throwing the country into turmoil. The country is now preparing to go into another democratic election in April 2007 after the current president has served the constitutionally allowed maximum of two terms.



Figure 1.4. Map of Nigeria depicting the 36 States and the Federal Capital Territory
Source: Wikipedia, 2006.

Over the years, the dominant role of agriculture in the Nigerian economy especially in terms of the country's foreign exchange earnings gave way to petroleum. The country is a member of the Organisation of Petroleum Exporting Countries (OPEC) and is the largest exporter of crude oil in Africa. To date, the government has largely controlled vast industrial and commercial enterprises. There are also large, multinational companies as well as organized small-scale enterprises. Nigeria has a large public sector comprising

over 550 public enterprises in most sectors of the economy and dominating activities in the power, telecommunications, petroleum and steel sectors (NDHS, 2003).

Education in Nigeria has evolved over a long period of time, with a series of policy changes. As a result, there have been increases in the enrolment of children and in the number of educational institutions both in the public and private sectors. The Universal Basic Education (UBE) launched in October 1999 made it compulsory for every Nigerian child to be educated free of tuition up to junior secondary school level in an effort to meet the country's manpower requirement for national development.

On health front, the fourth National Development Plan (1981-1985) established a government commitment to provide adequate and effective primary health care that is promotive, protective, preventive, restorative and rehabilitative to the entire population by the year 2000. A national health policy was consequently adopted in 1988. The objective is to provide the population with access not only to primary health care but also to secondary and tertiary care as needed through a functional referral system. The health sector is however characterized by wide regional disparities in status, service delivery and resource availability (NDHS, 2003).

The National Policy on Population for Development, Unity, Progress and Self-Reliance of 1988 was revised in 2004. The new policy recognizes that population factors, socio-economic development and environmental issues are interwoven and are critical to the achievement of sustainable development in Nigeria. The overall goal of the 2004

National Policy on Population for sustainable Development is the improvement of the quality of life and the standards of living of the people of Nigeria (Federal Government of Nigeria, 2004). While the 1988 policy specifically targeted reducing the number of children a woman is likely to have during her lifetime to four per woman by the year 2000, the 2004 policy is not so explicit. It however aims to achieve a reduction in the total fertility rate of at least 0.6 children every five years.

The Nigerian population is ethnically and religiously heterogeneous. The most populous and politically influential groups are the Hausa and Fulani (29%), the Yoruba (21%) and the Igbo (18%). Half of Nigeria's population is Muslim while 40% are Christians and 10% hold indigenous beliefs (Population Resource Center, 2004). Culturally, Nigeria is a male dominated society. Most ethnic groups exhibit strong patriarchal systems that confer on men decision-making roles in matters affecting the family and society. In addition, wives on the average are dependent on their husbands socially and economically.

Adherence to one religion or the other is a common phenomenon in Nigeria. This has also influenced the issues surrounding fertility practices in the country. Indeed, most Muslim and indigenous religious practitioners as well as a great number of Christian faithfuls hold family relationships and kinship sacred despite the related economic burdens. This invariably affects the degree of fertility preferences willingly exercised by individuals.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0. INTRODUCTION

This chapter is divided into four sections. The first section presents a critical review of relevant literatures. The second section discusses the fertility theories guiding this work. Their appropriateness and challenges are also highlighted. The third section presents the frameworks that will be used in the analysis of this study and section four presents the hypotheses to be tested in the study.

2.1. REVIEW OF LITERATURE

2.1.1. POPULATION AND DEVELOPMENT ISSUES IN AFRICA

The dramatic decline in mortality in the developing countries in the 1950s, brought about by modern advancements in public health technology marked the beginning of demographic transition in the region of the world occupied by these countries. The decline, but unaccompanied by a significant decline in fertility, caused the post-war acceleration in population growth and consequently, a mounting concern for the implications to these countries and the world at large (El-Badry, 1992). The struggle to contain population growth, started at this time.

Numerous policy formulations and programmes of action came into being in almost all the countries as a result of the various conferences and meetings on the issues of

population and development to address the menace. The interrelationship between population growth and development in general is well documented (UNFPA, 2004; 2007) and this has been the thrust of various global conferences, projects and programmes - the most current of which is the millennium development goals (MDG).

By late 1970s, persistent fertility decline was on in all of these regions and the world in general. Substantial variation however exists between and within regions and countries. For example, the world total fertility rate (TFR) declined from 3.6 in 1988 to 3.1 in 1994 and 2.9 in 2000. The figures for Asia in these years were 3.6, 3.1 and 2.8 respectively while it was 6.3, 5.9 and 5.3 for Africa (Population Reference Bureau, 1988; 1994; 2000).

The main factor behind this decline is the globalization of fertility attitudes and behaviour (including fall in the demand for children traceable to a host of actual and anticipated changes in survivorship rates), the family economy, educational and labour market opportunities and in related normative images of family and society (Caldwell, 2001; Caldwell & Caldwell, 2002; McNicoll, 2003).

From all account, Africa and the Sub-Sahara African region in particular are lagging behind in the downward trend of fertility. Fertility transition is shown to be occurring mainly in the whole of southern Africa, Kenya, particularly its central region and parts of the West African coast (including southern Nigeria). Outside this, it occurs mostly in the cities and urban areas of the other parts of the continent. This is attributed to the

continued prevalence of those conditions that led to a belated fertility decline in the region, in the rural areas (Shapiro and Tambashe, 2002; Caldwell and Caldwell, 2002).

The main support for high African fertility has been adduced to: the African traditional society and religion, which stressed the importance of ancestry and descent and the separation of cost of childrearing (through the practice of polygyny and child fostering) and reproductive decision-making. On the list is also the aversion to things seen as incompatible with African culture or religious beliefs (including the use of contraceptives) (Caldwell, Orubuloye and Caldwell, 1992; Makinwa-Adebusoye, 2001).

In addition to this high value placed on having children, a number of other issues still confront the Africa continent and the Sub-Saharan Africa region in particular. These include: young age at marriage, low contraceptive use, low level of education, gender disparity in socio-economic status, unequal access to information and services, high levels of infant and child mortality, maternal mortality, high levels of poverty, prevalence of communicable diseases (including HIV/AIDS), emergence of non-communicable diseases as well as poor health and nutritional conditions among others (El-Badry, 1992; UAPS, 2007).

Of great concern is the high value traditionally placed on children, which has sustained the high fertility rate in the region and made it resistant to the forces that brought about fertility decline elsewhere. One important consequence of high fertility is the large percentage of people under the age of 15, which has further compounded the problem of education, health and nutrition. Although, they could be seen as potential labour force,

the additional burden placed on an inadequate education system by the expansion of this segment of the population yielded unskilled labour force, which resulted into shortage of skilled labour in key sectors and occupations. This has imposed a constraint on economic development in the region (Caldwell, Orubuloye and Caldwell, 1992; El Badry, 1992; Kalipeni, 1995).

Nonetheless, the region has recorded a number of successes by pursuing vigorously the programmes of action from the population and development fora as well as some economic reforms aimed towards achieving sustainable growth and development as well as the millennium development goals. Of special note is that the number of children that people desire is declining and is increasingly becoming an important determinant of actual fertility (Mboup and Saha, 1998; Westoff and Bankole, 2002).

2.1.2. FERTILITY PREFERENCES

Fertility preference studies have looked at peoples' preferences using different terminologies and definitions. Desired family size, ideal number of children, fertility preference, desire for additional children and fertility intentions are some of the measures that have been used to describe and/or estimate the number of children that people actually want to have. For example, Monnier (1979) used intended additional births to refer to fertility intention; McCarthy and Oni (1987) used non-numeric responses while Nii-Amoo Dodoo (2001) used preference for no more kids.

The meaning and validity of these measures have been a source of controversy for quite sometime (Coombs, 1974, 1979; Bongaarts, 1990). For example, desired family size

refers to the number of children the respondent would have liked to have in his/her whole life irrespective of the number he/she already has. This is said to be prone to rationalization (upward adjustment in stated desired family size so that it is close or equal to actual number of children) and non-numeric bias (under reporting of average family size because some women are unable or unwilling to respond to the question on desired family size) (Bongaarts, 1990).

Questions on wanted status of recent births as a measure of wanted fertility have also being queried on account of non-uniformity in its phrasing in the different surveys and for being equally subject to rationalization (Rasul, 1993; Bongaarts, 1990; Eggleston, 1999; Adetunji, 2001). Responses to questions about desire for additional children also referred to as fertility or reproductive intention and dubbed fertility preference in the demographic and health surveys (DHS) are generally considered to be relatively unbiased, though not completely free of error (Bongaarts, 1990).

Some queries have been raised about the predictive value of these fertility measures. For example, Coombs (1979) used the National Survey of Family Growth (NSFG) data of the United States to show that individual's response to the question on intended family size is a point on a continuum, which conventional survey questions do not capture. In the survey, after the respondents have stated their preference, they were asked to give a second (third, fourth and so on) choice regarding family size. The responses were then scaled taking into consideration the direction of the choices of the women (lower or higher than the original stated number). The results show that identical statements about desired family size do not have the same meaning for all people. This finding casts doubt on the reliance of a single response to fertility intention questions.

Significant differences also exist between fertility intentions and behaviour (Cho, 1978; Monnier, 1979). Using the world fertility survey (WFS) data from five Asian countries, Cho found that the actual number of living children is often greater than the number the women say they want in all the countries. Monnier used a longitudinal study undertaken by INED to assess whether it is possible to forecast fertility behaviour from statements about intentions. Results show significant differences between intentions and behaviour especially among women who intended a second or third birth (predictive value of intentions were 0.637 and 0.357 respectively).

One other query about the predictive value of these measures on actual fertility is that it is usually based on the desires of women respondents, whereas studies have shown that fertility intentions of their husbands or partners do matter and has a great influence on actual fertility outcome (Beckman, Aizenberg, Forsythe & Day, 1983; Thomson, McDonald & Bumpass, 1990; Ezeh, 1992; Isiugo-Abanihe, 1994; Bankole, 1995; Thomson, 1997; Odimegwu, Okemgbo & Pallikadavath, 2005a; Odimegwu, Okemgbo & Pallikadavath, 2005b). Despite these misgivings, these preference measures continue to be very relevant because of their importance in the estimation of actual fertility.

Fertility preference in this study refers to the desired number of children, which is a response to the question “If you could choose the number of children to have in your whole life, how many would that be?”

Fertility preference studies in the Sub-Sahara region have shown high rate of disagreement among couples (Westoff & Bankole, 2002). While about 58% of wives in Kenya want no more children, only 49% of their husbands did not want more. The

corresponding figures for Ghana are 29% and 19% respectively (Bankole & Olaleye, 1993). The story is the same among the Yoruba of Nigeria where 24% of the wives compared to 18% of the husbands wanted no more births (Kritz, Gurak & Fapohunda, 1992).

In a study of seven Sub-Sahara African countries, Feyisetan & Casterline (2000) found that the indicators of fertility preferences reveal increases in the desire to limit childbearing and that these contributed substantially to the increase in prevalence of contraceptive use when the latter is decomposed into the explanatory variables. For example, controlling for demographic and socio-economic variables, the contribution of changing preferences to increase in contraceptive prevalence exceeds one-third in Ghana (37%). Similarly, decomposition of changes in fertility into its determinants shows that while on the average the level of implementation index is a more important determinant of fertility decline for all the developing countries examined, the demand for children (wanted fertility) is the dominant factor in Sub-Sahara Africa (Bongaarts, 1993; Ibisomi, 2002; Ibisomi, Odimegwu, Otieno & Kimani, 2005).

2.1.3. STUDIES IN NIGERIA

Fertility studies in Nigeria date back to decades and have examined a wide range of topics on fertility though mostly at local geographical areas. These include trends (Van De Walle, 1965 among others), determinants and differentials, adolescents' reproductive health (Otoide, Oronsaye & Okonofua, 2001; Adeboyejo & Onyeonoru, 2003), family planning (Renne, 1996; Lacey, Adeyemi & Adewuyi, 1997; Odimegwu, 1999), abortion

(Makinwa-Adebusoye, Singh & Andaru, 1997), poverty and fertility dynamics (Odusola, 2002); the relationship between child labour and fertility preferences of parents (Togunde and Newman, 2005) and a host of others.

Fertility trend studies have shown estimates of total fertility rate (TFR) in Nigeria for the years 1965, 1970, 1971-73 and 1975 to be 6.6, 6.5, 7.3 and 7.0 respectively. This generally implies a rise between 1965 and 1975. The 1981/82 Nigeria Fertility Survey put the TFR at 5.94 while the 1990, 1999 and 2003 NDHS put the estimates at 6.01, 5.2 and 5.7 respectively (NDHS, 2003; Feyisetan & Bankole, 2002). It is evident that the TFR has followed a downward trend after the 1970s if one ignores the figure given by the 1999 NDHS, which was reported to have been affected by underreporting of births (NDHS, 2003). Some favourable indicators for future fertility decline in Nigeria have also been alluded to. These include: decline in wanted fertility; increase in age at marriage; increase in contraceptive use, increase in the rate of abortion (even though this is illegal); erosion of social values placed on child bearing; increase in female enrolment at all levels of education as well as increasing participation of women in the labour force (Oladosu, 2001; Feyisetan & Bankole, 2002).

The studies that have examined the determinants of fertility at the national level show that postpartum infecundability accounts for most of the reduction in total fecundity. This is followed by marriage delay and contraceptive use. There are however considerable regional and socio-economic variations in the country (Adegbola, 1981; Akinkunmi, 1989; Isiugo-Abanihe, 1996). This variation is clearly manifested in a study of the proximate determinants of fertility of a Nigerian ethnic group, the Igbo, by Odimegwu & Zerai (1996). While the factors that have the most inhibiting effect on fertility in this

ethnic group remain basically the same as those at the national level, their importance is somehow reversed. For this sub group, the main fertility-inhibiting factors are marriage, use of contraception and post partum infecundability due to post-partum amenorrhea, in that order. Another example of these variations is the one found within unions. The inhibiting effect of marriage was found to differ by type and stability of marriage (Feyisetan & Togunde, 1988; Isiugo-Abanihe, Ebigbola & Adewuyi, 1993; Isiugo-Abanihe, 1999).

Although fertility preference studies have been limited in Nigeria, it is rich in content and diversity (in terms of coverage and study population). The 1987 study by McCarthy & Oni examined the determinants of desired family size among urban women in a South-Western city of Nigeria; Bankole (1995) studied couples preferences and their subsequent fertility also in the South Western part of the country while Isiugo-Abanihe (1994) examined the reproductive motivation and family size preferences among Nigerian men. Questions on fertility preferences are often responded to with non-numeric answers. This is rooted in cultural and religious beliefs as people are expected to leave their destiny wholly in the hands of their creator. This was the focus of the study by McCarthy & Oni (1987), where they examined the determinants of desired family size between women who express numerical and those who expressed non-numerical responses. Non-numeric responses were found to be common among young women, women with fewer children, women residing in low socio-economic area, women in polygamous marriages, Muslim women and women with no education.

Bankole (1995) in his own study brought forth the strong influence of men on fertility decisions, which cannot be ignored or captured by proxy information from the wives. He

found that fertility desires of both marriage partners are important predictors of the couple's fertility and that the desires of both spouses have equal effects on fertility behaviour. The husband's desire is however dominant in predicting couple's behaviour when the number of living children is small while the wife's desires become more important during the later stages of marriage. This in effect means that family size governs which spouse's fertility preference prevails (Hollander, 1996).

The Isiugo-Abanihe (1994) study however shows that preference for large family is very strong among Nigerian men (who generally decide and dictate what happens within and around the family) although there are considerable ethnic and religious variations. For example, average number of children desired is 4.90 among the Yoruba and the Igbo while it is 6.09 and 7.34 among the Hausa/Fulani and the Ishan respectively. Similarly, average number of children desired is 6.20 for the Muslims, 5.45 for the Catholics, 4.97 for the Protestants and 6.04 among the people who hold indigenous belief.

While the studies presented above from within and outside Nigeria have addressed various fertility and fertility preference issues, trend in fertility issues have not been examined comprehensively in Nigeria. Studies on the proximate determinants of fertility (mainly at local geographical level) have all used the Bongaarts (1978; 1982) framework, which has been faulted on some of the indices used due to changing pattern of sexual behaviour and other determinants. Relatively little have also been done to examine the extent to which couples and individuals have been able to achieve their fertility preferences. Also while there seems to be indication of fertility transition in Nigeria (Feyisetan and Bankole, 2002; NDHS 2003), there has not been a systematic investigation of the contributing factors to this decline.

This study therefore, examines the extent and how people have been implementing their fertility preferences in the country and how this has contributed to fertility changes in Nigeria. This study will be of immense benefit to the country for it will be the first comprehensive national data analysis of fertility dynamics in Nigeria utilising the three national NDHS data sets. It will therefore contribute to the body of knowledge on fertility issues in the country.

2.2. THEORETICAL FRAMEWORKS OF FERTILITY

There are a number of theories used to explain fertility behavior. These have looked at fertility from different disciplinary and methodological perspectives. These include general socio-economic studies (identified with sociology and social demography), the psychosocial and microeconomics of fertility approaches (identified with psychology and economics respectively). The socio-economic and microeconomic theories are to be used in this study.

2.2.1. SOCIO-ECONOMIC PERSPECTIVE

In the socio-economic studies, fertility is traditionally arrayed against one or more explanatory variables both at macro and micro levels. The interpretation of the results from these analyses was improved upon by incorporating proximate determinants in the analysis. With the insertion of a new stage in the sequence, fertility is then seen as determined directly by a set of 'proximate determinants' with the background variables (social, economic, cultural, health and environmental factors) in turn operating only indirectly on fertility through these determinants. These 'proximate determinants' comprise factors such as the extent of exposure to intercourse (marriage patterns),

fecundability (including frequency of intercourse), duration of postpartum infecundability, spontaneous intrauterine mortality, sterility and use of deliberate fertility control (contraception and induced abortion). The intermediate variables allow the identification of the pathways through which different socio-economic variables affect fertility (Davis & Blake, 1956; Bongaarts, 1978; Bongaarts & Potter, 1983; Odimegwu, 1996).

The Bongaarts (1978) version, which was built on the work of Davis and Blake (1956) has been used for a variety of purposes. These include: decomposition of the contribution of each of the proximate determinants to the realization of the current level of the total fertility rate and analyzing the contribution of changes in the proximate determinants to changes in the total fertility rate over time. Others are: comparing the differences in fertility between countries or regions on the basis of differences in the proximate determinants as well as projecting future levels of contraceptive use that would be required to achieve fertility goals given expected changes in the other proximate determinants or future levels in the fertility given expected or desired changes in contraceptive use.

The Bongaarts (1978) framework is one of the most widely used tools in fertility analysis and has influenced the collection and reporting of fertility data. As a result, a large amount of additional data on the proximate determinants is now available, which presents the opportunity to refine the proximate determinants indices (Stover, 1998).

Using this framework (with a little modification to the marriage index), Jolly & Gribble (1993) in their analysis of twelve Sub-Sahara African countries' DHS datasets, found that

contraceptive use in Sub-Saharan Africa is fairly low and that fertility and its determinants have changed over time. They also found that primary sterility of women in the developing countries is much lower than the 3% estimate given by Frank (1983).

The shortcoming of the Bongaarts (1978) formulation, however, is that it assumes that all fertility occurs within marriage or union, which is not necessarily the case in many parts of the world (including Nigeria). Hence this study will use (and make a comparison of) both the Bongaarts formulation and its Stover's (1998) refinement in the estimation of the inhibiting effect of the proximate determinants variables on fertility. Stover uses recently sexual active women as the base population since it represents exposure to conception than marriage. Availability of data on abortion is also a problem especially in Sub-Sahara Africa to operationalize the formulation in full (Jolly & Gribble, 1993; Stover, 1998).

2.2.2. MICROECONOMIC PERSPECTIVE

The microeconomics approach to the study of fertility determinants focuses more on the economic dimension of fertility choice. The conventional theory of consumer behaviour views the individual as trying to maximize satisfaction, given a range of goods, their prices, and his/her own tastes and income (Becker, 1960; Easterlin, 1975; Beaujot, Krotki & Krishnan, 1978; Montgomery, 1987; Bongaarts, 1993; Shapiro, 1997; Robinson, 1997). Basic to the theory is the proposition that children are a special kind of capital goods and fertility is seen as a response to the consumer's demand for children relative to other goods. The model presumes that couples would have, as many children as they

could if doing so were costless in terms of money, time and foregone opportunities. However, why fertility fell as income increases in the course of demographic transition led to the inclusion of the concept of child quality by Becker (1965) in the economic model.

A more comprehensive treatment of the production of children to the microeconomic theory of fertility was introduced by Easterlin (1975). This model incorporated Becker's earlier work, which focused on the demand for children. At the same time, Easterlin (1975) sought to develop a model that would be compatible with the approaches to fertility used in other disciplines (Shapiro, 1997). Thus, a sociological variable (the subset of ‘proximate determinants’ relating to deliberate fertility control) was added. He proposed that the determinants of fertility are seen as working through one or more of the following: the demand for children, the potential output of children and the costs of fertility regulation, including both subjective (psychic) and objective (time and money required to learn about and use of specific techniques) costs.

The dependent variable is measured by the total number of surviving children couples will have at the end of the reproductive span of the wife. Demand is measured as the number of surviving children parents would want if fertility regulation were costless while potential output was the number of surviving children parents would have if they did not deliberately limit fertility. The framework was used to show how modernization leads to a shift from high to low fertility as described by the demographic transition theory (Easterlin, 1975).

Jejeebhoy (1978) adopted the Easterlin framework in a study where she considered whether the regulating subpopulation might be distinguished from the natural fertility subpopulation primarily on the basis of a higher potential number of surviving children, or on a lower desired family size, or on the basis of lower costs associated with fertility regulation. She found that at the early stages of fertility transition in Taiwan, the regulating subpopulation may be distinguished from the natural fertility subpopulation on the basis of their higher levels of natural fertility and lower infant and child mortality. Also, on the basis of their more favourable attitudes toward and awareness of fertility regulation rather than on the basis of desired family size, which remained uniform for both subpopulations. She submitted that time series data is more appropriate in order to test the relative roles of natural fertility and desired fertility (between the natural and regulating subpopulations) in the pattern of the fertility transition.

The Easterlin framework has been criticized for the unsuitability of the dependent variable in macro level analysis (Bongaarts, 1993). The number of living children which is the outcome variable is rarely used in macro level demographic studies of fertility levels, trends and differences. Total fertility rate (TFR) is preferred at macro level analysis, which is not easily related to the number of surviving children. Another criticism of the model is that it is cohort-based in the reproductive experience of women as the rate of childbearing and the supply and demand are measured at the end of the childbearing years, hence refer to the past experience over the reproductive life cycle of a cohort of women. Also, it does not capture rapid recent changes in fertility behaviour, which are now occurring in many developing countries. The model is also faulted for its assumption of fixed demand for children (this is assumed to be determined at the time of

marriage and to remain constant throughout the childbearing years). This could be problematic where changing socio-economic conditions lead couples to revise their demand for children. Finally, the model does not propose a convenient equation that relates the dependent variable to the independent variables, which makes it difficult to quantify the role of each independent variable in observed changes in the rate of childbearing accurately (Mchenry, 1984; Montgomery, 1987; Bongaarts, 1993; Ibisomi, 2002; Ibisomi, Odimegwu, Otieno and Kimani, 2005).

An alternative approach to the implementation of Easterlin's model was proposed by Bongaarts (1993). In the framework, Bongaarts asserts that child mortality influences demand and not supply of children as past mortality experience as well as risks of future child mortality are usually taken into account by couples before arriving at a desired family size. It posits that fertility (F) as measured by total fertility rate is an outcome of the interaction of supply of births (natural fertility), demand for births (wanted fertility) and degree of fertility preference implementation. The degree of preference implementation is in turn dependent on cost of fertility regulation and that of unwanted childbearing.

This variant differs from the original Easterlin formulation in three ways: it measures reproductive performance, supply and demand in terms of births; it is period based and it introduced a new variable, 'the degree of preference implementation' (this index gives the extent to which people are able to implement their fertility preferences) to quantify the roles of the costs of fertility regulation and unwanted childbearing. A procedure for

decomposing fertility trends between two surveys to determine the relative role of each of the determinants to fertility changes was also proposed.

Bongaarts went further to explain how to identify the causes of fertility declines in specific populations and operationalised the framework by estimating the levels of preference implementation for 18 DHS countries. He also used 12 of the 18 countries with WFS and DHS data sets to decompose changes in fertility into its determinants. Ibisomi (2002) and Ibisomi et al (2005) adopted the same framework in the analysis of changes in fertility across 60 developing countries. The results of the two studies show that the level of implementation index is lowest in Sub-Sahara Africa and that on the average, the value of the index has been increasing for countries with trend data. The decomposition procedure shows that preference implementation is a more important determinant of fertility decline than wanted fertility.

It is however noted that the formulation is only relevant in a situation where observed fertility (F) exceeds wanted fertility (F_w)(An excess supply situation. Hence its relevance and adoption for this study since this is the case in Nigeria) and for macro level analysis where averages of the determinants are used in the calculations. For example, using the formula [$I_p = (F_n - F)/(F_n - F_w)$] for the estimation of the degree of preference implementation (I_p), a situation whereby F and F_w are equal to F_n (natural fertility i.e. couples prefer to have their full potential and got it) and where $F_w > F$ (excess demand situation) cannot be captured. Further work is clearly needed on the indicator to incorporate all the possible outcomes of the interplay between natural, wanted and actual fertility and also to be able to estimate preference implementation at the micro level. The

latter will address how the ability of individuals to implement their fertility preferences has contributed to fertility changes in the country. These identified lags are however beyond the scope of this study.

The degree of preference implementation is also dependent on the cost of fertility regulation and that of unwanted childbearing although not operationalised in the framework. These two are too generic and their component parts need to be examined more closely for a better understanding of the background characteristics that work through these two to result into the ability of couples to implement their fertility preferences**.** This examination is attempted below.

2.2.2.1. Cost of fertility regulation.

Cost of fertility regulation is the subjective (psychological, health) and objective (time and money) costs of learning about and using specific fertility regulation techniques (Easterlin, 1975). A comprehensive means of fertility control include: regulating access to or frequency of heterosexual intercourse; employing some temporary device which allows intercourse without resulting into pregnancy; employing permanent means of breaking the link between intercourse and pregnancy and ending a pregnancy after it has occurred. These can be achieved through celibacy, abstinence within marriage, contraception, sterilization and abortion (Warren, 1997).

Most authors agree that there are three main types of cost involved in adopting and using contraception. These are psychic, social and market costs. Psychic cost includes attitude or displeasure towards use as a result of fears, anxieties and risks about health and the

threat of a loss of sexual pleasure because known methods of contraception are considered to be unacceptable. The psychic cost also includes knowledge of fertility control methods. The market cost is basically the fund and time required to learn and use the techniques while social cost is defined as the perceived risk of incurring societal, familial or spousal disapproval for fertility regulating practice(s) (Easterlin, 1975; Warren, 1997; Shapiro, 1997).

2.2.2.2. Cost of unwanted childbearing

The cost of unwanted childbearing can be better conceptualized when taken as avoiding cost of additional child(ren). The cost of a child involves cost in resources required to rear the child to adulthood. These resources include: food, shelter, clothing, costs of education and health care among others as well as the time-labour cost of providing childcare (Easterlin, 1975; Beaujot, Krotki & Krishnan, 1978; McCarthy & Oni, 1987; Warren, 1997).

These costs certainly differ across strata. They are also multi dimensional and difficult to measure. The market wage rate of women (which is embedded in the time-labour cost) is usually taken as a proxy for cost of children (Warren, 1997). This basically measures costs in terms of the number of years lost to childbearing. The amount of education women hope their children will achieve and willingness to support children in post-secondary education have also been used as indicators of cost of a child (Beaujot, Krotki & Krishnan, 1978; McCarthy & Oni, 1987). For example, McCarthy & Oni (1987) in a household survey carried out in Ilorin, South West, Nigeria used aspiration for son and daughter's education up to secondary and post secondary levels as one of the independent

variables in the examination of the differences between respondents who expressed numerical fertility desires and those who did not. They found that women with relatively low aspirations for the education of their sons and daughters are more likely to give non-numerical responses.

The question is to what extent is the market wage rate of women a proxy for cost of a child in Nigeria, where childbearing and or rearing and economic activities and or other engagements of women go on concurrently? This is because childcare can be purchased or voluntary while the parents are engaged in productive work. Measuring cost using the level of education parents wish their children to attain can also be problematic. This is because parents' aspiration cannot be equated with affordability. They may also hope for assistance through scholarships and other means such as child fostering. A parent's response to the question can also be limited to her exposure or knowledge of what she thinks is the ultimate educational level and not necessarily because she did not want the best for the child. In addition to this, education in Nigeria is relatively cheap when compared with the cost in other parts of the world and the Universal Basic Education (UBE) launched in October 1999 made it compulsory for every Nigerian child to be educated free of tuition up to junior secondary school level. Costing a child in general appears to be an uphill task especially its quantification.

Attaching appropriate weights to the identified proxies of these two determinants of levels of fertility preference implementation and offsetting them is practically impossible and unrealistic. For example, fertility regulation costs are likely to be no more than a tiny fraction of the net return or the net cost anticipated from having a child (Pritchett, 1994; McNicoll, 2003). Even if one is able to quantify these costs appropriately, presently,

there is no established quantitative method of estimating the degree of fertility preference implementation for individual women because of the difficulty involved in calculating natural fertility for individual women. This thus makes it difficult to link the index to its determinants quantitatively.

Also, although children come with positive (benefits) and negative (costs) values, marriage and having children are two events that are universal in Nigeria and are embedded in the people's way of life. The special and coveted high status, which children bestow on both mothers and fathers together with other social and psychological benefits of children are much more important determinants of fertility than the economic benefits derived from having them. For example, children validate marriages and bring about stronger emotional ties to social groups and the partner (Makinwa-Adebusoye, nd[1]; Kohlmann, 2002).

Thus, due to the fact that having children in the Nigerian context, goes beyond the arithmetic of costs and benefits and the difficulty of quantifying the costs of unwanted childbearing and that of fertility regulation, qualitative data will be used to look at the context within which the two costs influence couples decision to control or not to control fertility thereby influencing the level at which they achieve their fertility preferences. The exploration will cover the costs in terms of resources (which is affected by prevailing socio-economic conditions in the country), time-labour, emotional and the psychological requirements of bearing as well as rearing a child to adulthood. The qualitative data will also be used to explore the costs of fertility regulation, especially the social and psychic

[1] Not dated

costs, as well as the other ways and means of fertility regulation. The value(s) of children will equally be explored.

2.2.2.3. The Male factor

It is noted that all the variables factored into the derivation of the index of preference implementation are woman-based although; the index is touted to be measuring the ability of couples and individuals in achieving their fertility preferences. It is important to note that the fact that a woman does not want a pregnancy does not necessarily imply that the husband does not want the pregnancy. This study will therefore attempt to bring out the role of the men in fertility preference, outcome and the extent to which the women are able to implement their fertility preferences.

Studies have shown that the fertility preferences of men play a very important role in fertility outcomes. An examination of spousal influences over each other's reproductive motivations and behaviour in Ghana and elsewhere shows that husbands have greater control over couples reproductive decision-making and behaviour than their wives (Ezeh, 1993; Bankole and Singh, 1998; DeRose, Nii-Amoo Dodoo and Patil, 2002; DeRose, 2003). Bankole (1995) in his study in South West, Nigeria on couples' fertility preference and subsequent fertility found however that fertility desires of both marriage partners are important predictors of the couple's fertility and that the desires of both spouses have equal effects on fertility behaviour. Studies have also shown that disagreement among couples regarding the number of children wanted reduce the likelihood that either spouse will achieve individual preferred fertility (Beckman, Aizenberg, Forsythe & Day, 1983; Thomson, McDonald & Bumpass, 1990; Thomson, 1997; Bankole, 1995).

2.3. FRAMEWORK FOR ANALYSIS OF PRESENT STUDY

2.3.1. PROXIMATE DETERMINANTS OF FERTILITY

The Bongaarts' et al proximate determinants of fertility (1984) and its Stover's modification (1998) will be used in the analysis of the proximate determinants of fertility. The socio-economic perspectives of fertility hold that all demographic, socio-economic, cultural, institutional, psychological, health and environmental factors (background variables) operate through the proximate or intermediate variables to affect fertility.

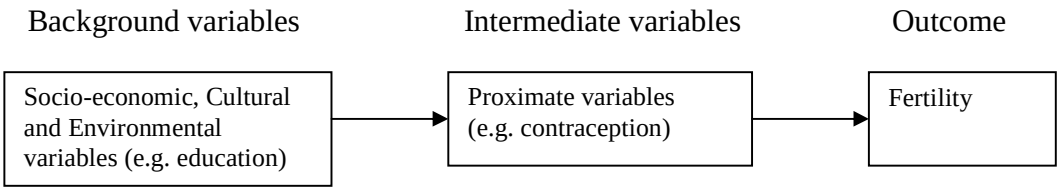


Figure 2.3.1. Bongaarts model on the principal role of the proximate variables on fertility

Bongaarts (1982) showed that the differences in fertility among populations are largely due to four proximate determinants namely: marriage, contraception, induced abortion and postpartum infecundability. In a later paper, a fifth determinant, pathological sterility was added (Bongaarts et al, 1984).

The basic 1984 model of the proximate determinants of fertility is:

TFR = C*m**C*i**C*a**C*p**C*c**TF

where, C*m* is the index of proportion married, C*i* is the index of lactational infecundability, C*a* is the index of abortion, C*p* is the index of pathological sterility, C*c* is the index of contraception, and TF is total fecundity. This model assumes that all

childbearing takes place within marriage, which is not the case in most parts of the world including Nigeria. Hence, the Stover's refinement of the Bongaarts formulation will also be used and the results of the two compared.

Stover (1998) argued that since the C*m* index is intended to represent the effect of periods during which a woman is not sexually active, the proportion sexually active in the last month plus women who are not now sexually active but who are currently pregnant or abstaining postpartum (since they have recently been exposed to the risk of pregnancy) should be used in place of proportion of married women aged 15-49 that is usually used. This he said is a more direct measure of exposure to pregnancy than marriage and should be used where such data is available. He also modified the components used in the calculations of C*a* (by multiplying contraceptive prevalence by the effectiveness, to describe more accurately the proportion of women protected by contraception) and C*c* (proposed that infecundity consideration be removed from this index since it is now included in the sterility index). These refinements produce the following model:

TFR = C*x**C*i**C*a**C*f**C*u**PF

where, C*x* is the index of proportion married, C*i* is the index of postpartum infecundability, C*a* is the index of abortion, C*f* is the index of sterility, C*u* is the index of contraception and PF is potential fecundity (i.e. the level of fertility that would occur in the absence of all the proximate determinants). These two models will be used in the examination of proximate determinants of fertility in Nigeria.

2.3.2. FERTILITY PREFERENCE IMPLEMENTATION INDEX

The framework for this purpose is adapted from the Bongaarts (1993) variant of the supply-demand framework for the determinants of fertility and enhanced by ideas from literature reviewed on the crucial role of males on eventual couples' fertility behaviour. Below is a summary of the key variables and their relationships in the Bongaarts (1993) model.

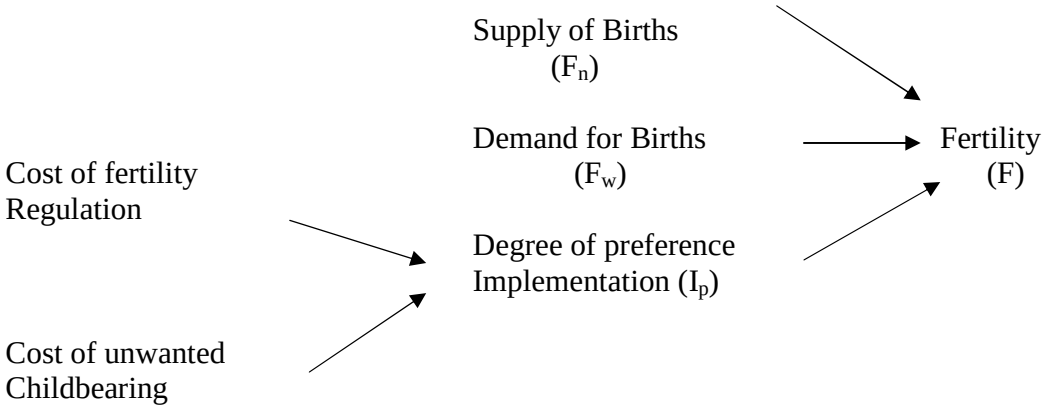


Figure 2.3.2a. Key variables and interrelations in variant of supply-demand model.
Source: Bongaarts, J. (1993). The supply-demand framework for the determinants of fertility: An alternative implementation.

where

Supply of births (F_n) is measured as natural total fertility. Natural fertility means the rate of childbearing that would prevail in the absence of deliberate efforts by couples to limit family size.

Demand for births (F_w) is measured as wanted total fertility. Wanted fertility is the rate of childbearing that would be achieved if all women were able to eliminate unwanted births.

Degree of preference implementation (I_p) is measured by an index with values ranging from 0 to 1. The level of implementation is the net result of a decision making process in which couples weigh the cost of fertility regulation and the cost of unwanted childbearing. In general, I_p rises as cost of regulation declines and that of unwanted children increases. With full preference implementation, $I_p = 1$ (no unwanted births occur and actual fertility equals wanted fertility). At the other extreme with no preference implementation, $I_p = 0$ (observed fertility equals natural fertility).

The degree of preference implementation is expressed mathematically as:

$I_p = (F_n - F)/(F_n - F_w)$

The above framework is expanded to incorporate the role of males in fertility decision-making and outcome.

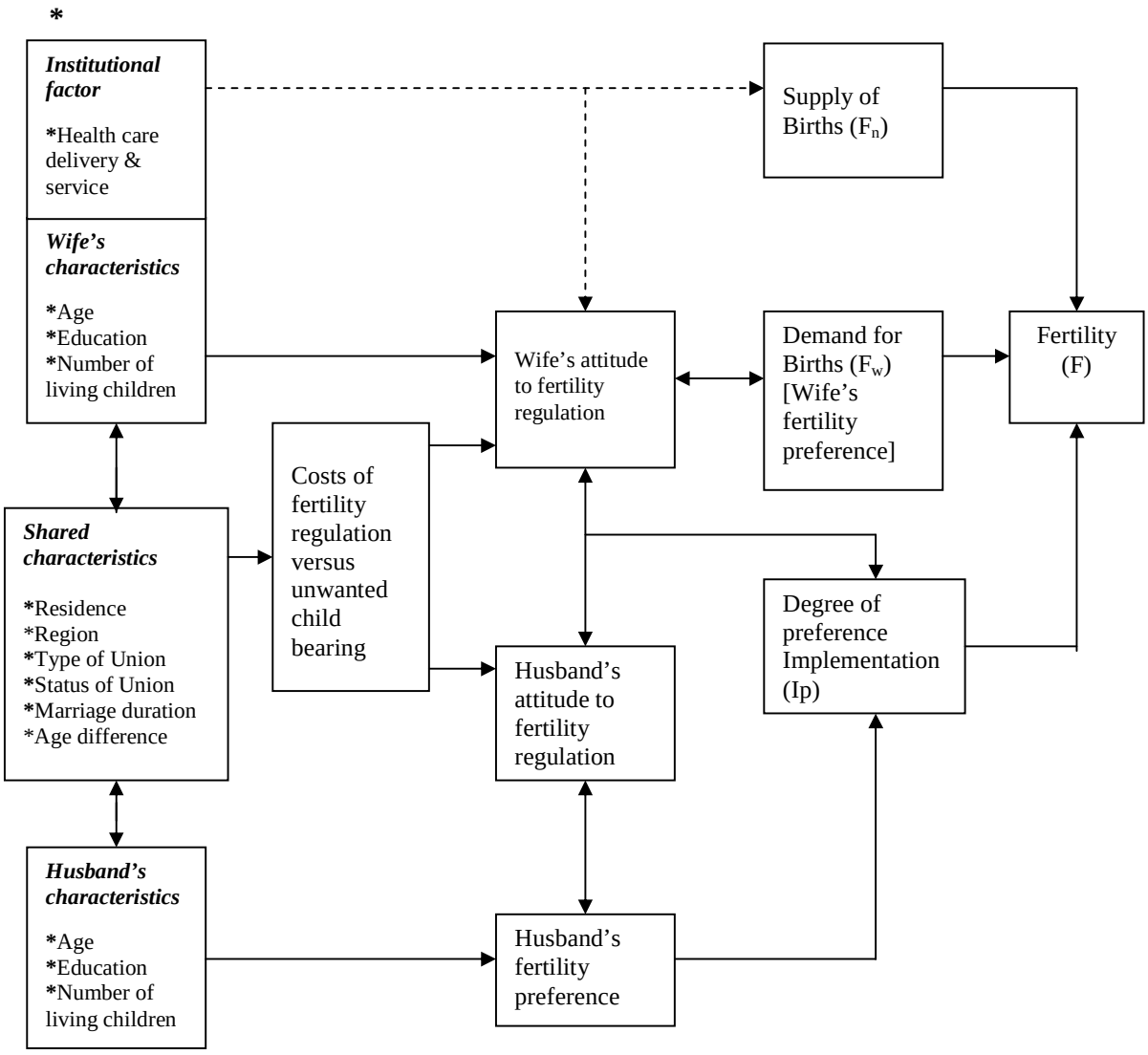


Figure 2.3.2b. Operational framework for analysis of fertility preference implementation in Nigeria.

--------- Link not operationalised.

In the fortified framework above (Figure 2.3.2b), which will be used in the analysis of this study, couples' individual characteristics have effect on their shared characteristics and vice versa while the three influence couples' individual attitude to fertility regulation and fertility preferences. The couples' characteristics equally influence the way they perceive and balance out the costs of fertility regulation and that of unwanted child

bearing which eventually inform their attitude to fertility regulation. The availability and accessibility of health care service also influences couples fertility regulation attitude and preference as well as the woman's natural fertility (For example where the service is available and of good quality, it can increase natural fertility through prompt treatment of diseases that give rise to infecundability. However, this variable will not be operationalised due to lack of an adequate measure in the available data sets).

In the model, the woman's attitude to fertility regulation influences her fertility preference and vice versa. Likewise for the man. The model also shows that the fertility attitude and preferences of the two spouses have influence on each other for it is the outcome of this that determines the extent that a woman achieves her fertility preferences. The actual fertility is then determined by the woman's fertility preference (demand for births), natural fertility (supply of births) and the extent to which she is able to implement her fertility preference (degree of preference implementation).

2.4. HYPOTHESES

In line with the research objectives and from the literatures reviewed as well as the theoretical framework that will be used in the analysis of this work, the main hypotheses to be tested in this study are:

1. The indices of marriage/sexual activity, postpartum insusceptibility and contraception (in that order) have the most inhibiting effect on fertility in Nigeria. This is on the assumption that the recent socio-economic changes in the country has a declining effect on the percentage of women in marriage while sexual activity (in particular non-

marital) is increasing; that contraceptive usage is increasing and that period of postpartum amenorrhea is declining.

2. The degree of fertility preference implementation is higher in the south than in the North, higher among urban residents compared to the rural residents and it increases as the level of education increases. This assumes that the enormous internal diversity across the country will equally be manifested in the extent by which people across the divide in the country have been able to achieve their fertility preferences.

3. The degree of fertility preference implementation is higher among couples with similar desired number of children than among discordant couples. This assumes that desires of both marriage partners are important predictors of the couple's fertility outcome. Disagreement among couples regarding the number of children wanted will reduce the likelihood that either spouse will achieve individual preferred fertility.

4. Degree of fertility preference implementation is increasing and playing an increasing (a more positive) role in fertility changes in Nigeria. There has been a general decline in fertility worldwide, which has substantially closed the gap that exists between actual and wanted fertility. This is expected to dilute the overwhelming effect and contribution that wanted fertility has on fertility changes and hence, an increase in the role played by the level of fertility preference implementation.

5. The husbands have more influence on their wives family planning attitude and desired number of children than the wives' have over the husbands'. This is on the premise that Nigeria is a male dominated society where the man decides matters affecting the family and society in general.

CHAPTER 3

DATA SOURCES AND METHODS

3.0. INTRODUCTION

This chapter discusses the methodology of the study. The study population and data source are discussed. Variables used in the analysis are also presented together with their respective definitions. The study hypotheses are stated. Scope and limitation of the study, plans for utilization and dissemination of the result as well as procedures for data management and analysis are also highlighted. The chapter concludes with an assessment of the quality of data and examination of the indirect techniques for adjusting fertility estimates used in the analysis of this work.

3.1. DATA SOURCES

This study makes use of both qualitative and quantitative data to achieve the research objectives. For the first part of the study, which is a secondary data analysis, the 1990, 1999 and 2003 Nigeria Demographic and Health Survey (NDHS) data sets were used while focus group discussion technique of gathering qualitative information was used for the second part.

3.1.1. THE NIGERIA DEMOGRAPHIC AND HEALTH SURVEY (NDHS)

The three NDHS are not too different from each other. In general, the main objective of the three is to provide up to date information on fertility; infant and child mortality; immunization levels; marriage; fertility preferences; awareness, approval and use of family planning methods; breastfeeding practices; nutritional status of mothers and young children; maternal and child health; female genital cutting, sexual activity and awareness

as well as behaviour regarding AIDS and other sexually transmitted infections in Nigeria. The information are intended to assist policy makers and administrators in evaluating and designing programmes and strategies for improving health and family planning services in Nigeria. The following is a summary of the methodology of the surveys as contained in the 1990, 1999 and 2003 NDHS full reports.

3.1.1.1. Organization

The Federal Office of Statistics (FOS) of Nigeria conducted the 1990 NDHS while the National Population Commission (NPC) [Nigeria] conducted the 1999 and 2003 rounds. The 1990 and 2003 NDHS were funded by the United States Agency for International Development (USAID) and the Nigerian Government. These two bodies were joined by the United Nations Population Fund (UNFPA) to fund the 1999 NDHS. Macro International Inc provided technical support for the three surveys through MEASURE DHS+, which is a project sponsored by USAID to assist countries worldwide in conducting surveys to obtain information on key population and health indicators. Other development partners in the 2003 survey include Department of International Development (DFID) and the United Nations Children's Fund (UNICEF).

3.1.1.2. Sample Design

The 1990 NDHS was a nationally representative probability sample of women aged 15-49. The sampling frame for this survey was drawn from the national master sample for the 1987/1992 National Integrated Survey of Households (NISH) programme. The 1990 NDHS was designed with twofold over sampling of the urban stratum, yielding 132 urban enumeration areas (EAs) and 167 rural EAs. From each EA, a list of the names of

the head of households was constructed, from which a systematic sample of 34 households was selected to be interviewed. The 1990 NDHS is a weighted sample of about 10,000 households. The response rates for the 1990 NDHS sample are 95.1% and 95.4% for the household and women interviews respectively.

The 1999 NDHS was another nationally representative probability sample of women aged 10-49. The sampling frame used for the survey was constructed from the 212,079 EAs into which the country was delineated for the 1991 population census. Altogether, 400 (119 urban and 281 rural) EAs were selected with equal probability. A listing of all households in each selected EA (which was the primary sampling unit) was conducted and one in every five households listed was selected for interview at the second sampling stage. A total of 7, 919 households were sampled, of which, 7, 736 were determined in the field to be valid households. In processing and estimating the population parameters, the sample returns were weighted and the weights were standardized and entered with the individual data records. The response rates for the 1999 NDHS sample are 98.8%, 91.9% and 87.0% for the household, women and men interviews respectively.

A weighted probability sample of 7,864 households was selected for the 2003 NDHS. The sample was selected using a stratified, two-stage cluster design. In the first stage, 365 (165 in urban and 200 in rural areas) clusters were selected from a list of enumeration areas (used as the sample frame) developed from the 1991 population census. In the second stage, a complete listing of households was carried out in each selected cluster from which households were then systematically selected. The response rates for the 2003 NDHS sample are 98.6%, 95.4% and 91.2% for the household, women and men interviews respectively. For details of the sample design for the three surveys, please see

NDHS full report 1990, 1999 and 2003 on pages 137-139; 179-184 and 211-213 respectively.

3.1.1.3. Survey Questionnaires

Three questionnaires were used in the 1990 fieldwork. These are: the household (used to identify people eligible for the individual questionnaire), the women's (individual) and the service availability (designed to assess the availability or supply of health and family planning services) questionnaires. In addition to these three, the men's questionnaire was also used during the 1999 survey. Only three questionnaires were used in the 2003 survey. These are the household, the women's and the men's questionnaires.

The questionnaires were adapted (from the DHS model questionnaire) to reflect relevant population and health issues in Nigeria. The questionnaires were developed in English and translated into six languages (Efik, Hausa, Igbo, Kanuri, Tiv and Yoruba) in the 1990 survey but into only the three major languages - Hausa, Igbo and Yoruba in the 1999 and 2003 surveys. The women's questionnaire was administered to all women aged 15-49 who were listed on the household questionnaire in the 1990 and 2003 surveys. For the 1999 survey however, the women's questionnaire was administered to all women aged 10-49. This was influenced by pre-test findings on teenage pregnancy, motherhood and age at commencement of sexual activities. Analysis was however restricted to women aged 15-49 since most of the variables are not relevant for the youngest women. The men's questionnaire was administered to men (aged 15-64 in the 1999 NDHS sample while it was for men aged 15-59 in the 2003 NDHS sample) living in every third household.

3.1.1.4. Training and Field Work

High calibre supervisors, field editors, male and female interviewers and quality control personnel were recruited from all the states and the federal capital territory (FCT) for the surveys. Training of field staff was carried out in two phases for the 1990 NDHS. The training was devoted to lectures, demonstrations of interview techniques and instruction on how to complete the questionnaires, practice reading the questionnaires and role playing in local languages and practice fieldwork. The field staff consisted of 25 teams, each composed of four female interviewers, one female editor and one male or female supervisor. Fieldwork was conducted from April-October 1990.

For the 1999 NDHS, two levels of training were organised. The first was the training of trainers while the second involved the training of interviewers, supervisors and field editors. Those trained at the first level facilitated training at the second level. The field staff for the 1999 NDHS consisted of 34 teams, each composed of one supervisor, one field editor, four female interviewers, one male interviewer and a driver. The fieldwork was carried out between 29 March and 29 May 1999.

Training for the 2003 NDHS included lectures, presentations, practical demonstration and practice interviewing in small groups. The 2003 fieldwork took place between March and August 2003. Twelve interviewing teams, each comprising of one supervisor, one field editor, four female interviewers, one male interviewer and a driver conducted the 2003 survey. Selected households were also independently re-interviewed by quality control personnel.

3.1.1.5. Data Processing

The 1990 data processing took place at the FOS head office in Lagos by four data entry clerks and one supervisor (all staff of the FOS). The 1999 and 2003 surveys were processed at the NPC demographic laboratory and were done by NPC personnel. The personnel consisted of data entry operators, supervisors and coders/editors. Staff of Macro International Inc (USA) trained the personnel. The microcomputers, printers and programme (Integrated System for Survey Analysis) used were also provided by Macro. Processing commenced shortly after fieldwork. This enabled feedback to be given to the teams on the field, which improved performance. Data processing personnel for the 1999 NDHS consisted of 20 data entry operators, two supervisors and six coders/editors while the 2003 team included: two supervisors, a questionnaire administrator (who ensured that the expected numbers of questionnaires from all clusters were received), three office editors, 12 data entry operators and a secondary editor.

3.1.2. FOCUS GROUP DISCUSSION (FGD)

Focus group research is based on facilitating an organized discussion with a group of individuals selected because they were believed to be representative of some class. The discussion is used to bring out insights and understandings in ways, which cannot be captured by questionnaire. The interaction among focus group participants brings out differing perspectives, people get caught in the spirit of group discussion and may reveal more than they would in the more formal interview setting. In the course of discussion, new avenues for exploration are opened and multiple meanings are revealed as different discussants interpret topics of discussion in different ways.

The FGD technique was used in this study to bring out insights and understandings of issues examined in ways, which could not be captured in the quantitative data as well as to give comprehensive interpretation to the results derived from the quantitative analysis.

This study being national in scope, participants for the focus group discussions (FGD) were drawn from Imo (Orlu and Orsu), Kano (Kano Municipal and Karu) and Oyo (Egbeda and Eruwa) States of the South Eastern, Northern and South Western geographical zones of Nigeria respectively. These three zones were selected because they depict the three main ethnic tribes in Nigeria. The Hausa is in the North, The Ibo in the South East and the Yoruba in the South West.

The FGD sessions were conducted at both rural and urban areas in each of the zones. A small town was used for urban and a typical village as rural in each of the zones. This was to ensure, as much as possible that it is actually the views of the indigenous population that was sought. The participants in the FGDs were men aged 35 to 59 and women aged 35 to 49 years. Respondents in these age groups were chosen because they are the ones that are more likely to have completed their family size and hence can give comprehensive and quality information on how particular fertility preferences are achieved. The age at last birth of the women that wish to have no more children are also marked at this age group. The participants were further stratified by level of education.

In total, there were 8 sessions in each of the zones and the participants were classified as follows:

1. Urban males, aged between 35 and 59 with less than completed secondary education.
2. Urban males, aged between 35 and 59 with completed secondary or higher education.

3. Urban females, aged between 35 and 49 with less than completed secondary education.
4. Urban females, aged between 35 and 49 with completed secondary or higher education.
5. Rural males, aged between 35 and 59 with less than completed secondary education.
6. Rural males, aged between 35 and 59 with completed secondary or higher education.
7. Rural females, aged between 35 and 49 with less than completed secondary education.
8. Rural females, aged between 35 and 49 with completed secondary or higher education.

Recruitment involved the contact people on the ground going round to identify the people that had the required characteristics and inviting them for the sessions. Overall, eight (4 for men and 4 for women) FGD sessions were conducted in each of the geographical zones. Discussions were held in the local language most understood by the participants. Each session had between 5 and 8 participants and lasted between one and half and two hours. The sessions were recorded on tapes and notes were also taken by note-takers. The tapes were transcribed verbatim in the local languages and then translated into English and typed out on a computer.

The FGD sessions in Oyo state was facilitated by the Director and four other members of staff of the Association for Reproductive and Family Health (ARFH) of Nigeria as well as five officers of the Oyo State Ministry of Education. In Kano, a Non-government Organization (NGO) by name: Concerned Mothers Organization facilitated the sessions while a doctoral candidate facilitated the sessions with the assistance of 4 teachers in Imo

state. Further details on the conduct of the sessions as well as the discussion guide are contained in the FGD protocol in Appendix 3b.

3.2. DATA METHODS

3.2.1. STUDY POPULATION AND SAMPLE SIZE

The study population consisted of 8,781; 8,199 and 7,620 women aged 15-49 interviewed during the 1990, 1999 and 2003 NDHS, respectively. In addition, 2,584 men aged 15-64 and 2,346 men aged 15-59 interviewed during the 1999 and 2003 NDHS respectively were used. One thousand, one hundred and sixty-eight (1,168) couples' records derived from the 2003 NDHS and 1,280 (constructed) couples' records for 1999 were also used. A total of eighty-nine (89) men and eighty-five (85) women participated in the twenty-four (24) focus group discussion sessions.

3.2.2. MAIN VARIABLES USED IN THE STUDY AND THEIR DEFINITION.

Table 3.2.2. Variables and their definition

VARIABLES	DEFINITION
Background characteristics variables	
Age	Current age of respondent
Region	North East (1), North West (2), South East (3), South West (4)
Type of place of residence	Urban (1), Rural (2)
Highest educational level	None (0), Primary (1), Secondary (2), Higher - tertiary (3)
Type of union	Monogamous (1), Polygamous (2).
Status of union	Formal union (1), Cohabiting (2)
Births in last five years	
Desired number of children (grouped).	
Fertility preference	Have another (1), Undecided (2), No more (3), Sterilized (4), Declared infecund (5).
Desire for more children	Wants within 2 years (1), Wants after 2 years (2), Wants, unsure of timing (3), Undecided (4), Wants no more (5), Sterilized (6), Declared infecund (7), Never had sex (8)
Number of living children	
Total number of children ever born	
Planning status of recent birth	Wanted then (1), Wanted later (2), Wanted no more (3).
Preceding birth interval of last child	The difference in months between the last birth and the birth prior to that (previous birth).
Months of breastfeeding of last child	Calculated months of breastfeeding of the last child.
Months of amenorrhea after last child	Calculated months of postpartum amenorrhea after the birth of the last child.
Months of abstinence after last child	Calculated months of postpartum abstinence after the birth of last child.
Attitude to fertility regulation	Approve (1), Disapprove (2)
Intermediate variables	
Degree of preference implementation (I_p)	This is the net result of a decision making process in which couples weigh the cost of fertility regulation and the cost of unwanted childbearing. It is measured by an index with values ranging from 0 to 1. In general, I_p rises as cost of regulation declines and that of unwanted children increases. With full preference implementation, $I_p = 1$ (no unwanted births occur and actual fertility equals wanted fertility). At the other extreme with no preference implementation, $I_p = 0$ (observed fertility equals natural fertility). The value of I_p chosen by couples determines where actual fertility falls within the range set by wanted and natural fertility.

Wanted fertility (F_w)	Expresses in theory what the level of fertility would have been if all unwanted births were eliminated. It is calculated in same manner as F but unwanted births are excluded from the numerator. Unwanted births are those that occur after the woman has reached the point at which she does not want any more children. Mistimed births that occur before the desired family size is achieved are considered wanted.
Supply of births (F_n)	Measured as natural total fertility. Natural fertility means the rate of childbearing that would prevail in the absence of deliberate efforts by couples to limit family size.
Current contraceptive method	Not using (0), Pill (1), IUD (2), Injections (3), Diaphragm/Foam/Jelly (4), Condom (5), Female sterilization (6), Male sterilization (7), Periodic abstinence (8), Withdrawal (9), Other (10), Norplant (11), Abstinence (12)
Current use of contraception	No method (1), Traditional method (2), Modern method (3)
Duration of breastfeeding of last child	Duration of breastfeeding of the last child in months.
Duration of amenorrhea after last child	Duration of postpartum amenorrhea after the birth of the last child in months.
Duration of abstinence after last child	Duration of postpartum abstinence after the birth of the last child in months.
Age at first marriage	Age at start of first marriage or union.
Age at first birth	Age of the respondent at the first birth.
Age at first intercourse	Age at first sexual intercourse.
Recent sexual activity	Time since last intercourse less than 31 days.
Exposure	Fecund (0), Pregnant (1), Amenorrhic (2), Infecund/Menopausal (3)
Current marital status	Never married (0), Married (1), Living together (2), Widowed (3), Divorced (4), Not living together (5).
Dependent variable	
Total fertility rate (F)	The number of children a woman would have by the end of her childbearing years if she were to pass through those years bearing children at the currently observed age specific rates. To be computed from the number of live births that occurred in the period 1-59 months preceding the survey and the number of woman-years lived in each of the specified 5-year age groups during the 1-59 months preceding the survey.
Imputed variable	
Proportion of married women who practice contraception (U)	This refers to the proportion of married women who were using contraceptive methods at the time of the survey. Measured as number of married women using contraceptive method to the total number of married

	women. The variable will be calculated from current marital status and current use of contraception.

3.2.3. SCOPE AND LIMITATIONS

- The difficulty in estimating natural fertility for individual women limits the exploration of the contribution of individual women to the observed trend in the degree of fertility preference implementation.

- The results generated give an ecological view of the issues raised, and cannot be individualised. This implies that the result of the data analysis is at the aggregate level (macro), and cannot be attributed to individuals or interpreted at individual (micro) level.

- The NDHS data being cross-sectional in nature makes it difficult to ascertain the cause-effect (temporal sequence) relationship of variables.

- The focus group responses could be more of social responses rather than practical, as discussants would want to be seen as socially correct by their peers in the group.

These limitations in my opinion do not affect the result of the study significantly. For example, only similar variables were used in analyses and where differences exist, efforts were made to standardize the variables as done for the variation in regional groupings in the three surveys (this was disentangled to obtain a uniform grouping).

3.2.4. DATA MANAGEMENT AND ANALYSIS

Statistical Package for Social Scientists (SPSS) for Windows, Stata 8.1, Ms Excel, MORTPAK and Population Analysis Spreadsheet (PAS) were used in the management and analysis of the data sets. A number of variables were computed and recoded. A couple dataset was also created from the 1999 Men and Women individual data sets.

For the first objective, which is to examine the levels, trends and differentials in fertility behaviour, a number of analyses were carried out. These are:

- Estimation and comparison of lifetime (CEB) and current (ASFR, TFR) fertility
- Examination of the level and trend of age at first birth and age at last birth
- Examination of non-marital fertility and teenage pregnancy and motherhood (levels and trend by background characteristics of the respondents)
- Estimation of the median length of birth interval as well as parity progression ratio across age group and other characteristics of the women.

In the estimation of all means and medians in this study, the Kaplan Meier survival analysis (also known as the product limit estimator) is used. This is a univariate non-parametric technique for estimating time-related events. It is especially applicable when length of follow-up varies from case to case and the technique takes into account losses from the sample before the final outcome is observed. This is the case for example, in the duration of breastfeeding, abstinence and amenorrhea, where the number of months of experiencing the event varies from respondent to respondent among those who have experienced the event while some respondents (censored cases) were yet to experience

the event as at the time of measurement (i.e. survey time). The basic computations for the survival curve rely on the computation of survival probabilities (i.e. computing the number of cases (people) who have experienced the event of study at a certain time point, divided by the number of cases in the study at that time).

$$P[T \geq t_i \mid T \geq t_{i-1}]$$

where $t_1, t_2, \ldots, t_{i-1}, t_i$ represent times when event occurs.

The equation above implies, the probability of a person under observation having not experienced the event to a specific time given that the person did not experience the event to the previous time.

It should be noted that medians are calculated in this analysis where the normality diagnostics tests carried out show that the data is skewed (i.e. not normally distributed). Statistically, the median is a better measure of central tendency in such a case (Janda, 2007). Examples here include age at first marriage, age at first birth and age at first intercourse. See appendix 3a for details.

For objective 2, which is to identify the proximate determinants of fertility, there will be:

- Examination of age at first marriage and first sexual intercourse in the total sample of women as well as percentage of women that are married, primarily sterile, sexually active and contracepting (percentage contracepting done for married and sexually active respondents);

- Examination of the average duration of breastfeeding, abstinence, amenorrhea and postpartum insusceptibility (by proportion of respondents that are married and sexually active); and

- The Bongaarts et al (1984) and Stover's (1998) formulations were then used to estimate the proximate determinants indices to assess their inhibiting effect on fertility.

The Bongaarts formulation is as follows:

TFR = C*m**C*i**C*a**C*p**C*c**TF

Where,

C*m* = $\sum f(a) / \{\Sigma f(a)/m(a)\}$; but $g(a) = f(a)/m(a)$, hence,

C*m* = $\{\Sigma m(a)*g(a)\}/\Sigma g(a)$

C*i* = 20/(18.5 + *i*)

C*a* = TFR/{TFR*0.4*(1 + *u*)*TAR}

C*p* = (7.63 – 0.11**s*)/7.3

C*c* = 1 – 1.08**u***e*

C*m* is the index of proportion married, C*i* is the index of lactational infecundability, C*a* is the index of abortion, C*p* is the index of pathological sterility, C*c* is the index of contraception, and TF is total fecundity; *m*(*a*) = age-specific proportion married; *g*(*a*) = age-specific marital fertility rates; *i* = average duration of postpartum amenorrhea; *u* = contraceptive prevalence; TAR = total abortion rate, 0.4*(1 + *u*) = estimate of the births averted by a single abortion; *s* = proportion of women aged 45-49 who have had no live births; *e* = average effectiveness of contraception; the adjustment factor 1.08 (or the age-

specific equivalents: 1.02, 1.02, 1.03, 1.04, 1.12, 1.33, 2.08) is designed to remove infecund women from the equation.

while the Stover's refinement of the Bongaart's formulation is as stated below:

TFR = C*x**C*i**C*a**C*f**C*u**PF

C*x* = *s*

C*i* = 20/(18.5 + *i*)

C*a* = TFR/(TFR + 0.4*(1 + *u***e*)*TAR)

C*f* = 1 - *f*

C*u* = 1 - *u***e*,

where *s* = proportion of women aged 15-49 who are sexually active (where sexually active means active in the last month or pregnant or abstaining postpartum); *i* = the mean duration (in months) of postpartum insusceptibility; *u* = the proportion of sexually active, fecund women using contraceptives that does not overlap with that experiencing postpartum amenorrhea; *e* = the average effectiveness of contraception; TAR = the total abortion rate; *f* = the proportion of sexually active women who are infecund; and PF = the index of potential fertility.

To apply to five-year age groups, C*i* becomes

C*i* = BI/(BI – 1.5 + *i*),

where BI = the average birth interval in the absence of lactation, contraception and postpartum abstinence estimated as 15-19 = 17.5; 20-24 = 18.3; 25-29 = 19.2; 30-34 = 20.0; 35-39 = 20.8; 40-44 = 21.7 and 45-49 = 22.5.

For the third objective, only married samples were used. Degree of preference implementation for 1990, 1999 and 2003 will be calculated for the country as a whole and by regional, type of residence and educational level characteristics as well as by desired number of children, type and status of union among the samples of couples.

The quantitative relationships between fertility and its determinants according to the Bongaarts (1993) formulation is expressed thus:

$$F = F_w + F_u \quad (1)$$

where F is total fertility (births per woman), F_w is wanted fertility and F_u is unwanted fertility (which can simply be expressed as $F - F_w$).

$$F_u = (F_n - F_w) \times (1 - I_p) \quad (2)$$

where F_n is total natural fertility and I_p is the index of preference implementation with values ranging from 0 to 1. With full preference implementation, $I_p = 1$ (which implies that $F_u = 0$ and $F = F_w$) and I_p is 0 with no preference implementation (this implies a substantial level of unwanted childbearing and $F = F_n$).

F_u is a function of the difference between supply and demand, and the degree of preference implementation.

Substitution of (2) in (1) yields

$$F = F_w \times I_p + F_n \times (1 - I_p) \quad (3)$$

Fertility levels can be calculated using equation (3).

Bongaarts further expressed how natural fertility could be obtained thus:

$$F_n = F/C \quad (4)$$

where C is an index between 0 and 1 that measures the proportional reduction in natural fertility attributable to deliberate birth control.

$$C = 1 - 1.02 \times U \quad (5)$$

where U represents the proportion of married women who practice contraception. Substitution of (5) in (4) gives an estimate of F_n.

He also expressed the fact that the degree of preference implementation can be obtained by rearranging equation (3) to give

$$I_p = (F_n - F)/(F_n - F_w) \quad (6)$$

The indices were also calculated for concordant and discordant couples (H>W, W>H) in terms of desired number of children, type of union (Monogamous/polygamous) and status of union (formal/cohabiting). In the calculation of these, the couples' data were used.

To estimate the contribution of the degree of preference implementation to fertility changes between the periods in Nigeria (fourth objective), decomposition of fertility trend into its determinants as proposed by Bongaarts was done. This requires that estimates of observed, wanted and natural fertility, as well as the index of implementation are available for two successive points in time t_1 and t_2 in the same population. The following variables were used

	Observation point	
	t_1	t_2
Observed fertility	F_1	F_2
Natural fertility	F_{n1}	F_{n2}
Wanted fertility	F_{w1}	F_{w2}
Index of preference implementation	I_{p1}	I_{p2}

The decline in fertility between t_1 and t_2 is simply equal to $F_1 - F_2$, and this difference can be expressed as a function of the mediating variables by substitution of equation (3)

$$F_1 - F_2 = [F_{w1}I_{p1} + F_{n1}(1 - I_{p1})] - [F_{w2}I_{p2} + F_{n2}(1 - I_{p2})] \quad (7)$$

Since the emphasis here is on examining changes in fertility that result from changes in determinants, this equation can be rewritten as

$$\Delta F = \Delta F_w \bar{I}_p + \Delta I_p (\bar{F}_w - \bar{F}_n) + \Delta F_n (1 - \bar{I}_p) \quad (8)$$

Where ΔF, ΔF_w, ΔF_n and ΔI_p represent absolute changes in F, F_w, F_n and I_p respectively and $\bar{F}_w$, $\bar{F}_n$, and $\bar{I}_p$ are the average values of F_w, F_n and I_p respectively.

Equation (8) conveniently divides the observed fertility decline ΔF into three components corresponding to each of the three determinants

Change in	**Contribution to fertility decline ΔF**
Natural fertility ΔF_n	$\Delta F_n (1 - \bar{I}_p)$
Wanted fertility ΔF_w	$\Delta F_w \times \bar{I}_p$
Index of implementation ΔI_p	$\Delta I_p (\bar{F}_w - \bar{F}_n)$

The above shows that contribution of a change in wanted or natural fertility to the observed fertility decline depends on the average level of implementation index. Similarly, the fertility effect from a given change in the index of implementation depends on the average between natural and wanted fertility ($F_n - F_w$). The percentage contribution of each of the determinants to fertility decline can also be obtained by multiplying the ratio of change of each of the determinants to total fertility change by 100 (Bongaarts, 1993).

For the fifth objective, multivariate logistic regression analysis of the husbands' desired number of children and attitude to family planning was done by the husbands' and wives' individual characteristics as well as their shared characteristics. The same was done for the wives' desired number of children and attitude to family planning. Binary logistic regression model was used for attitude to family planning due to the dichotomous nature of the dependent variable while multinomial logistic regression was be used for desired number of children because it has three categories. For desired number of children, desired less than 5 children is the reference category while disapproves is the reference category for attitude to family planning. The categories of the dependent variables are as follows:

Desired number of children: 1 = desired 5 or more children, 2 = non-numeric response and 3 = desired less than 5 children.

Attitude to family planning: 0 = disapproves and 1 = Approves

The models enable entering several explanatory and mixed variables at the same time and give the magnitude as well as the direction of association between the various levels of each of the explanatory variables to the outcome variable while controlling for the other variables.

The underlying distribution of the logistic model is binomial. The fitted values lie between 0 and 1 and the relationship between the outcome and the independent variables is non-linear (s-shaped). The logistic regression model gives the probability that the outcome, occurs as an exponential function of the independent variables. It involves fitting to the data an equation of the form:

$\text{logit}(p) = \alpha + b_1X_1 + b_2X_2 + \ldots + b_nX_n$

where logit (p) is the log of the odds that the dependent variable is 1; α is the intercept; b_1, b_2, …, b_n are the regression coefficients. (Knoke, Bohrnstedt & Mee, 2002).

Multinomial logistic regression is an extension of the binary logistic regression which allows the simultaneous comparison of more than one contrast (i.e. dependent variable with more than two categories). The generalized logits are defined as log of the probability of each category over the probability of the response category. The model assumes a linear relationship for each logit and parallel regression lines and this is stated (for a three-category variable) thus:

$\text{logit}(p_1/p_3) = \alpha_1 + b_{11}X_1 + b_{12}X_2 + \ldots + b_{1n}X_n$

$\text{logit}(p_2/p_3) = \alpha_2 + b_{21}X_1 + b_{22}X_2 + \ldots + b_{2n}X_n$

where logit (p_1/p_3) and logit (p_2/p_3) are relationships between generalized logits and the independent variables (αs are the intercepts; bs are the coefficients of the predictor variables and Xs are the predictor variables) (Chass.ncsu, 2007).

Finally, the focus group discussion (FGD) sessions were analysed manually by themes to achieve the sixth objective. Findings of the quantitative and qualitative analyses were then integrated to bring out how and the context within which people have been achieving their fertility preferences.

3.2.5. ETHICAL ISSUES

The study made use of secondary data in large part. This has already been anonymised at the collation stage, hence, no risk of breaking any interviewee confidentiality or associated considerations in that regard.

For the focus group discussions, the code of ethics for research on human subjects (in this case discussants) as laid down in the University of the Witwatersrand document, P*olicy on Matters to Sensitive and Confidential Research,* was followed. The interviewees were properly and fully informed: of the nature of the study, that participation was voluntary and could be terminated at any point during the discussion. Their anonymity and confidentiality of the information given were also assured. Approval to conduct the FGD was applied for and received from the University's Committee for Research on Human Subjects (non-medical). See appendix 3b and 3c for the FGD protocol and the ethics approval respectively.

3.3. DATA QUALITY ASSESSMENT

In addition to gender, age and sleeping in the dwelling during the previous night were used to determine eligibility for the individual questionnaire. Eligibility of women, therefore, for the individual questionnaire and quality of information on age of respondent are both critical for a general assessment of the quality of the NDHS data. This is because, omission of certain women from the individual interview could potentially bias the results obtained. Deficiencies in age data could similarly affect most of the results, for many estimates are heavily dependent on age. For example, fertility rates - classifying respondents into the wrong five-year age group can affect the estimates of age-specific fertility rates (ASFR).

3.3.1. REPORTING OF HOUSEHOLD AGE

Intentional exclusion of eligible women has been reported in assessment of DHS data quality (Rutstein and Bicego, 1990). This has been attributed to the significant rigours of fieldwork in developing countries. For example, in areas where interviewers are responsible for both the household and the individual questionnaires, they may push the ages of some respondents (especially those whose exact ages are unknown) out of the eligible age range in order to reduce the number of women that have to be interviewed. This explains why DHS data indicate that age misreporting occurs more frequently for age groups at the age eligibility boundaries than for other age groups (Rutstein and Bicego, 1990).

Examination of age group ratios (for women) and sex ratios for age groups immediately above and below the age eligibility boundaries can help identify whether such systematic

exclusion of eligible or inclusion of ineligible women has occurred. The lower limit of age eligibility for the 1990 and 2003 was 15years while it was 10 years in the 1999 NDHS. If the ages of young women were systematically understated in order to avoid eligibility, the age ratio for the lower age limit would be low and the sex ratio high compared to the age group immediately outside. The situation would be the same when the age and sex ratios for the upper age limit (44-49) are compared with those of the age limit immediately outside (50-54).

Table 3.3.1a below shows the age and sex ratios for the lower and upper age boundaries as well as those of the two age groups immediately outside the boundaries. In all the cases except one (2003 lower age limit), the age ratios of the age group at the boundaries were lower than those outside while the sex ratios for the age groups at the boundaries were higher than those outside the boundaries. These are clear manifestation of out-transference of eligible women at both boundaries. However, at the lower boundary of the 2003 NDHS, there was in-transference of women although, this was quite low.

Table 3.3.1a. Age and sex ratios for eligible age group boundaries & age groups immediately outside.

	Outside lower boundary		Lower boundary		Upper boundary		Outside upper boundary	
Year	AR	SR	AR	SR	AR	SR	AR	SR
1990	109.1	94.7	77.0	125.4	74.6	117.9	137.4	68.0
1999	128.8	92.9	75.9	146.6	89.0	109.0	128.0	82.6
2003	99.9	98.5	97.9	92.4	88.8	105.0	119.5	84.2

AR – Age ratios
SR – Sex ratios

This result is also shown in Figures 3.3.1a and 3.3.1b. The similarity in the age and sex ratio at the outside lower boundary and lower boundary are depicted by the convergence of the boundaries' lines in both instances.

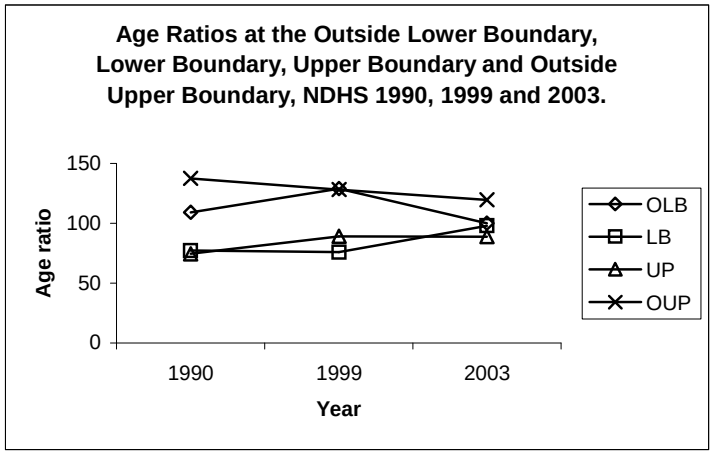


Figure 3.3.1a. Age ratio boundary effect, NDHS 1990, 1999 and 2003.

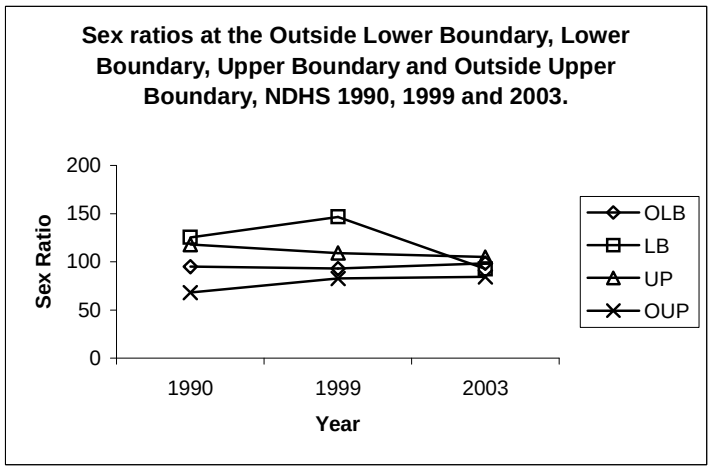


Figure 3.3.1b. Sex ratio boundary effect, NDHS 1990, 1999 and 2003.

Three boundary effect indices were calculated to reflect the extent of distortions in the age/sex structures of the three NDHS. These are the lower boundary distortion index (L), the upper boundary distortion index (U) and a summary of the two (T). The L, U and T indices are defined as:

$L = (AR_{15-19} - AR_{10-14}) - (SR_{15-19} - SR_{10-14})$
(These are age groups 10-14 and 5-9 respectively for the 1999 NDHS)

$U = (AR_{45-49} - AR_{50-54}) - (SR_{45-49} - SR_{50-54})$

$T = |L| + |U|$

A positive sign for L and U indicates that there was in-transference and a negative sign indicates out-transference. T on the other hand only indicates the degree of distortion not the direction.

Table 3.3.1b. Lower, upper and summary boundary distortions in age/sex structures of the 1990, 1999 & 2003 NDHS household samples.

Year	L	U	T
1990	-62.72	-112.69	175.4
1999	-106.67	-65.63	172.3
2003	4.14	-51.39	55.5

Table 3.3.1b above shows the values of L, U and T indices. All the values of L and U (except L for 2003, which shows a low level of in-transference) show out-transference (confirming the result of the age/sex ratios at the boundaries shown in Table 1) while the T values indicate high level of distortion in the 1990 and 1999 NDHS samples and a moderate level of distortion in the 2003 NDHS sample.

3.3.2. REPORTING OF AGE IN INDIVIDUAL INTERVIEWS

There are several ways to assess the quality of age data. One is to identify age structures that differ from expected patterns and that are more plausibly explained by misreporting than by real phenomena. Standard indices can also be computed where possible. Methods

used to identify errors in single years of age data include: graphical representation, Whipple's index and Myer's index.

3.3.2.1. Single years age data

A quick way to evaluate single year age data is to plot a line graph with ages in single years on the x-axis and the persons reporting at various ages on the y-axis. If the population under study has not experienced any sharp decline or increases in fertility, mortality or migration, the population age distribution is expected to follow a smooth linear graph. If this has been the case, fluctuation at various ages is noticed. If the peaks however are gotten at 0, 5 and even digits, it is an indication of preference for those particular digits. This reporting of certain ages at the expense of others is called age heaping, age preference or digit preference. Line graphs for the 1990, 1999 and 2003 NDHS for males and females are presented in Figures 3.3.2.1a-c below. There is obvious preference for ages ending in the terminal digits of 0 and 5 as also noted in the NDHS 1999 full report (page 201). There is some preference for ages ending in 2 and 8 also but this is not as much as it is for the terminal digits of 0 and 5. Excluding these spikes, the three female data sets show the expected downward trend along the ages. This linear pattern is not so pronounced for the males. This could be due to the smaller sample size for the males.

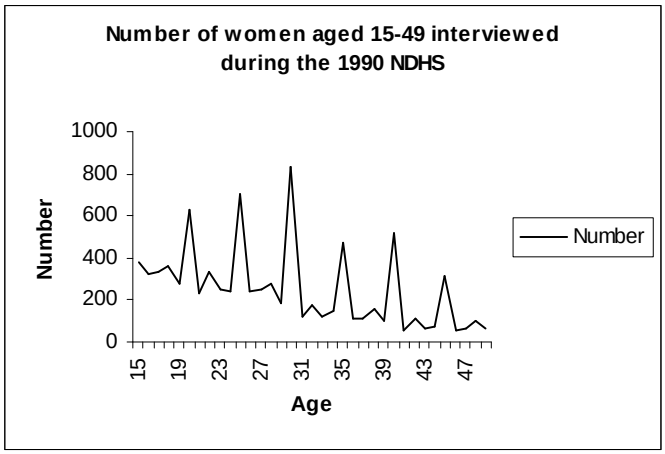


Figure 3.3.2.1a. Distribution in single years of age (Women). NDHS, 1990.

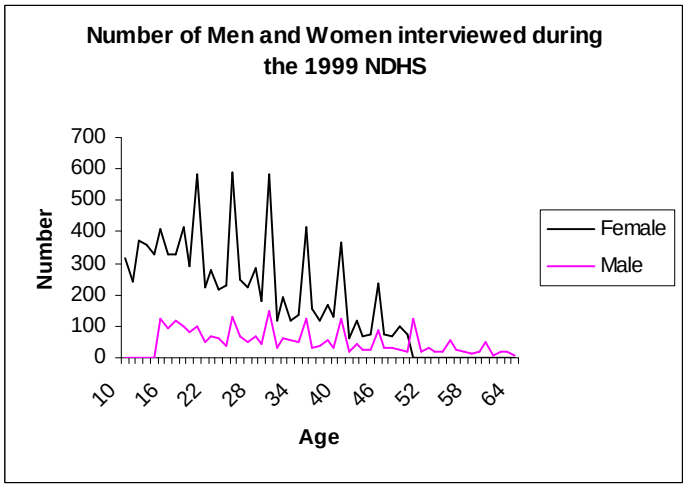


Figure 3.3.2.1b. Distribution in single years of age (Men & Women). NDHS, 1999.

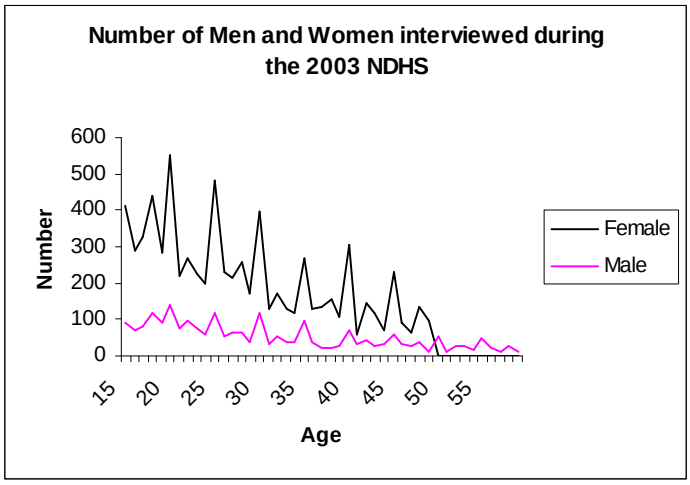


Figure 3.3.2.1c. Distribution in single years of age (Men & Women). NDHS, 2003.

Having been shown by the line graphs that age heaping occurred at certain digits, it is therefore necessary to find out the extent of such misreporting. This is not only useful for comparative purposes but greater accuracy in this regard also significantly enhances the value of the survey data.

Thus, data quality was further examined by Myers index. The index calculated for the 1990, 1999 and 2003 NDHS shows that at least 28.5, 21.74 and 16.62 percents of the women interviewed respectively had the last digit of their ages reported incorrectly. For men these are 22.67 and 16.54 percents in 1999 and 2003 NDHS samples, respectively. In the computation, only ages 20-49 were used for the females and 20-59 for the males so that each digit had the same chance of occurring. Using the pattern of grouping used by Rutstein and Bicego (1990) in the assessment of data quality, the figures derived for the Myer's index for the three sets of NDHS show all the data as having a high level of digit preference (See summary in Table 3.3.2.1 below and details of calculation in appendix 3d).

Table 3.3.2.1. Myer's index (Men & Women). NDHS 1990, 1999 & 2003.

1990	**1999**		**2003**	
Female	Female	Male	Female	Male
28.5	21.74	22.67	16.62	16.54

3.3.2.2. Five-year age group data

Using 5-year age group distribution is quite common in demographic analysis. By 5-year age grouping, many errors get reduced. For example, if many women aged 21, 22 or 23

reports their ages as 20, the error will be detected easily and may have profound effect when ages are in single years. Whereas, this is easily concealed and have no effect in the 20-24 age group. Percentage age distribution of women and men by age group in the 1990, 1999 and 2003 NDHS surveys are shown in Figures 3.3.2.2a and 3.3.2.2b, respectively.

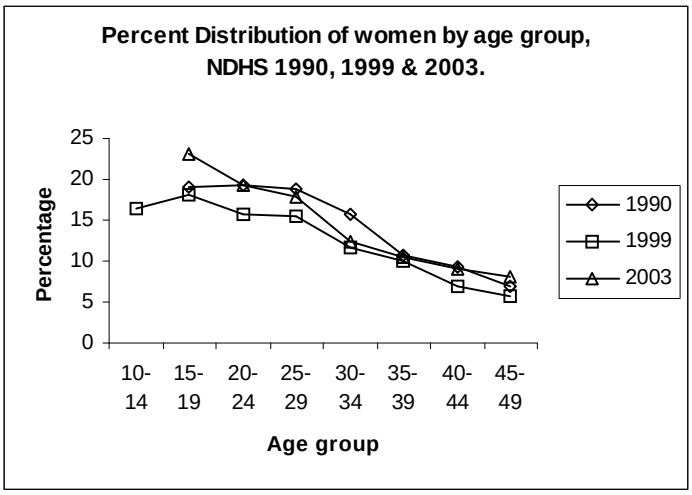


Figure 3.3.2.2a. Percentage distribution of women interviewed during the 1990, 1999 and 2003 NDHS

Apart from the similar percentage of women in the first three age groups (in particular, the low percent in the 15-19 age group) in the 1990 NDHS and the similar number of women in the 20-24 and 25-29 age groups in the 1999 NDHS, the plot shows the expected trend in the distribution of women along the age groups. The distribution in the 1999 survey would have been similar to the 1990 survey except that the drop in the first age group affected those aged 10-14. Interviewing the 10-14 years old therefore, seems to have protected the 15-19 years old from age transference (NDHS, 1999 report: 201).

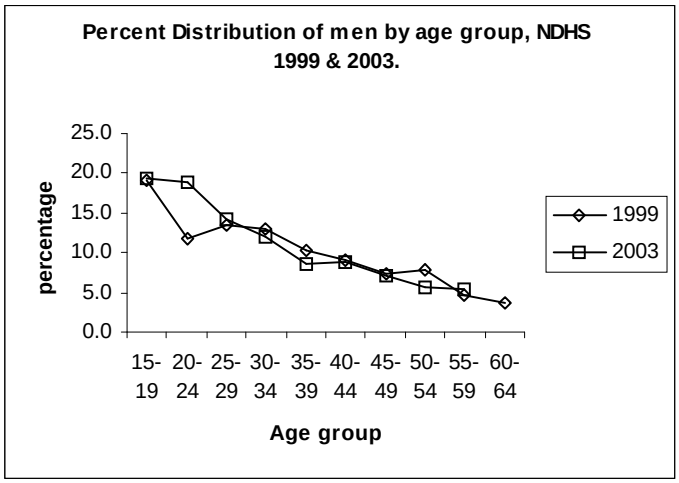


Figure 3.3.2.2b. Percentage distribution of men interviewed during the 1990, 1999 and 2003 NDHS

The age group distribution of the two male data sets on the average follows the expected downward trend with the exception of a sharp drop in the number of men aged 20-24 in the 1999 NDHS. The 2003 male data is more linearly distributed than the 1999 male age data.

Quality of surveys may also be evaluated by comparing age ratios (Shryock, Siegel and Associates, 1976). These were calculated for all the male (aged 15-59 years) and female (aged 15-49 years) data sets. The computed age ratios shows that on the average, age group misreporting for women in the 1990, 1999 and 2003 NDHS are 4.88, 6.43 and 4.75 respectively. The figures are 9.07 and 5.81 for the males in 1999 and 2003 respectively (See summary in Table 3.3.2.2. and details of calculation in the appendix 3e).

Table 3.3.2.2. Age Ratios (Men & Women). NDHS 1990, 1999 & 2003

1990	**1999**		**2003**	
Female	Female	Male	Female	Male
4.88	6.43	9.07	4.75	5.81

In the 1990 NDHS, the age ratios for the women are greater than but around 100 except at age group 35-39. The pattern is not so clear in the 1999 survey for the two sexes as well as the 2003 male data set. For the 2003 female NDHS sample, age ratios are generally lower than 100 except at age group 25-29. The mean absolute deviation of the age ratios for 1990 and 2003 are lower than those of 1999. The ratio is even much higher for the males in the 1999 survey. The variation in age ratios along the age groups are likely due to shifting of ages to neighbouring age groups.

3.3.3. BIRTH DATA

Another important measure of data quality is the completeness and accuracy of information on births. Drops in the number of births recorded after the cut off year and spikes in number of recorded births in the years preceding the cut off have been ascribed to deliberate birth transference or birth omission by the interviewers to avoid asking questions (on children) in the lengthy health section. The cut off year is the year at which the health section is completed for all births in that year and later years. This was five years prior to the 1990 and 2003 NDHS (1985 and 1998 respectively) while it was three years before the 1999 NDHS (1996).

Figure 3.3.3 shows that there was a drop in the number of births in the fifth year before the 1990 NDHS while the number of births for the previous year (i.e. sixth year before the survey) was considerably higher. It is also shown that in 1999, there was a drop in the number of births recorded for 1996 and 1997 (the two years after the cut off) relative to 1995 and 1994 (the two years preceding the cut off). These no doubt are due to birth transference or birth omission.

While the 1990 NDHS is clearly a case of transference of births, the 1999 NDHS does not show spike in births in the year or two prior to the cut-off but a trough in births for 1996 and 1997. This pattern is more consistent with omission of births rather than transference. This shortfall in the number of births in the 1999 NDHS was said to have resulted into an underestimate of current fertility of about 16-17 percent and a more likely estimate of the TFR for the 5-year period preceding the 1999 survey was put at 6.0 births per woman (NDHS 1999 report, 2000). The 2003 NDHS sample on the other hand suffer little from birth transference or omission. The observed drop in the number of births in year zero in all the data set is due to the fact that, year zero is the survey year and the births for that particular year was not complete as at the time of the survey. Hence, the small number of births recorded relative to the other years.

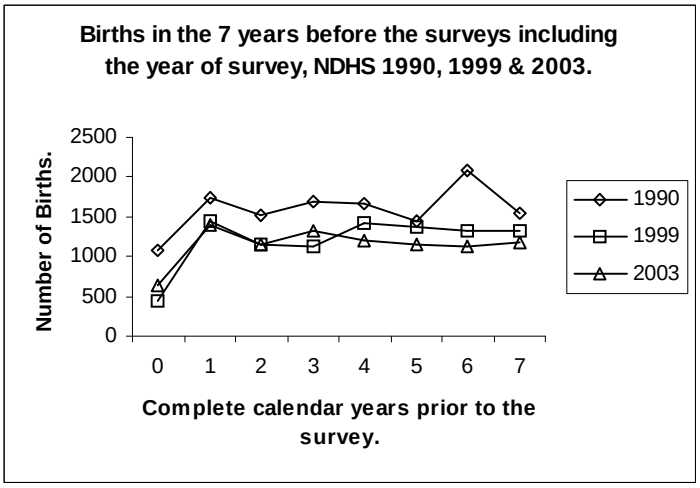


Figure 3.3.3. Number of births for the seven years before through the year of survey, NDHS 1990, 1999 and 2003.

3.3.4. COMPLETENESS OF REPORTING

Moderate levels of missing values were recorded for most variables in the 1990, 1999 and 2003 NDHS except variables such as children's size at birth, height and weight (NDHS 1990, 1999 and 2003 reports). These variables are not used in this study and hence, will have no effect on the results whatsoever. Table 3.3.4 below shows the percentage of missing information for birth date (births in the last 15 years before the survey with month and year of birth missing) and respondent's education (for all women interviewed).

Table 3.3.4. Percentage of missing information for birth dates in the last 15 years before survey and respondent's education, NDHS 1990, 1999 and 2003.

	Births in last 15 years	Respondent's education
1990	0.10	0.10
1999	1.40	0.30
2003	0.26	0.14

3.3.5. DISCUSSION ON DATA QUALITY

The distribution of the households' population and the individuals interviewed in single years of age shows a high level of heaping on ages ending in 0 and 5 (heaping also occurred at the terminal digits of 2 and 8 in the individual interview data but to a lesser degree) and out-transference of women at the age eligibility boundaries. For instance, the 1999 NDHS household sample reported a large number of women as being aged 9 (NDHS 1999:201). A likely explanation is that some interviewers intentionally displaced women aged 10,11,12 to younger ages to make them ineligible for the individual interview (women age 10-49 were eligible for individual interviews in the survey).

The age/sex structure of household samples and the lower and upper boundary distortion indices (L and U) confirm out-transference (except at the lower limit of the 2003 NDHS sample where there was a very low level of in-transference) of eligible women at the lower and upper age limits to age groups immediately outside the boundaries. The summary index of boundaries distortion (T) indicated that there was high level of distortion in the 1990 and 1999 NDHS samples while it was moderate in the 2003 sample.

The Myer's indices calculated for the three NDHS male and female data sets show high level of digit preference. Age accuracy indices computed for the group data was lowest in the 2003 sample, followed by the 1990 sample. They were also lower for the females than the males.

Transference of births out of the eligible boundary was observed in the 1990 sample while births omission occurred in the 1999 sample. The births omission in the 1999 NDHS was said to have resulted into under estimation of current fertility of about 16-17% (NDHS 1999 full report). There was no evidence of births transference or omission in the 2003 NDHS sample.

Response rates also have important effects on data quality. Households, which were part of the original sample but from which no information was obtained, may differ from households where questionnaires were completed (Rutstein and Bicego, 1990). Response rates for the three NDHS individual questionnaires were quite high (greater than 95%)

except in the 1999 individual women's interview and 2003 individual men's interview (91.9% and 91.2% respectively). The lowest response rate was 87% for the 1999 individual men's questionnaire. Given these high levels of response, it is unlikely that bias due to individual non-response would have a substantial effect on estimates from the three NDHS except there are huge differences in demographic behaviour between the two groups. This is unlikely to be the case as series of simulations conducted by Rutstein and Bicego (1990) on DHS data from 22 (9 from Sub-Sahara Africa) countries show that only under the most extreme assumptions concerning demographic behaviour of excluded women would estimate for TFR and other measures be biased.

Overall, the deficiencies found in the assessment of the 1990, 1999 and 2003 NDHS samples are the types typically found in retrospective surveys. The errors are not gross enough to seriously affect demographic estimates derived from them especially in this study where five-year age groups are used to derive all the fertility measures. The high level of digit preference at terminal digits 0 and 5 observed are easily concealed in the five-year age grouping. However due to the observed omission of births in the 1999 survey, a number of adjustment methods will be utilized.

CHAPTER 4

FERTILITY LEVELS, TREND AND DIFFERENTIALS

4.0. INTRODUCTION

This chapter presents the levels, trends and differentials in fertility measures in Nigeria over time. It begins with a comparison of the sample of respondents used in the analysis of this study. This is followed by direct and indirect estimates of current fertility. Lifetime fertility is estimated and compared with current fertility to examine changes in the levels of the two over time. Other aspects of fertility examined include: age at first birth, non-marital fertility and teenage pregnancy and motherhood. Lastly, parity progression ratios and birth interval patterns are examined.

4.1. BACKGROUND CHARACTERISTICS OF RESPONDENTS

This section presents the distribution of women interviewed during the 1990, 1999 and 2003 NDHS by some of their background characteristics, which could have an impact on fertility. These characteristics are age, place of residence, region, highest level of education and marital status. Table 4.1a basically gives a summary of the different categories of the women that are used in the analysis (of the entire work) of this study. This summary is important in that it could be used to compare the three groups of women to determine how similar (or otherwise) they are in characteristics.

Table 4.1a. Percentage Distribution of the Total Sample of Women (TSW), Currently Married Women (CMW) and Women whose Husbands were Interviewed (WHI) by Selected Background Characteristics.

	1990		1999			2003		
	TSW	CMW	TSW	CMW	WHI	TSW	CMW	WHI
Total number	8781	6696	8199	5755	1280	7620	5157	1168
Age group								
15-19	19.1	8.6	21.6	8.3	7.7	23.0	9.4	11.6
20-24	19.2	17.7	18.6	16.3	15.5	19.2	16.0	16.4
25-29	18.9	21.9	18.6	22.1	24.5	17.8	21.7	23.6
30-34	15.8	19.8	13.9	18.0	19.5	12.3	16.2	16.0
35-39	10.8	13.3	12.0	15.9	14.9	10.5	14.5	15.9
40-44	9.4	10.8	8.4	11.0	10.7	9.1	11.8	10.1
45-49	6.9	7.9	6.9	8.3	7.1	8.1	10.4	6.3
Mean age	28.17	30.11	27.95	30.61	30.34	28.02	30.96	29.79
Region								
North East	23.2	28.0	23.5	28.1	28.7	31.3	36.6	42.0
North West	19.3	23.3	25.2	29.1	27.7	22.9	27.9	27.7
South East	26.5	22.5	26.8	20.0	20.0	27.0	20.1	16.2
South West	31.0	26.2	24.4	22.9	23.7	18.8	15.5	14.2
Residence								
Urban	40.2	35.4	32.9	30.7	31.3	40.1	36.3	33.6
Rural	59.8	64.6	67.1	69.3	68.8	59.9	63.7	66.4
Education								
None	51.7	62.7	40.6	52.8	51.0	39.4	52.2	53.4
Primary	24.1	23.0	22.6	22.4	22.4	21.9	22.8	23.1
Secondary	21.8	12.5	30.5	19.4	21.1	32.3	20.0	19.7
Tertiary	2.5	1.9	6.4	5.4	5.5	6.4	5.0	3.8

For the total sample of women interviewed during the various surveys, their percentages decrease along age groups while for currently married women and those whose husbands were interviewed, the percentages increase up to age group 25-29 after which they are reversed. These trends are perfectly in harmony with the normal patterns as the number is expected to decline as age increases in a broad-based population. Also, as women in sexual union are responsible for the greater share of childbirths in any society, the trend in the percentage of currently married women and those whose husbands were interviewed is also consistent with the normal fertility pattern across age groups.

Mean age is about 28 years for the total sample of women in the surveys. This ranged from 30.11 in 1990 to 30.96 in 2003 for women who are currently married and around 30 years for women whose husbands were interviewed. This implies that there has been no substantial change in the mean ages of the categories of women over the years except for the currently married women where there is a difference of about 1 (0.85) year over the thirteen year period. Among the groups, the currently married women have the highest mean age, followed by those whose husbands were interviewed and lastly all the women interviewed. The high percentage of women aged 15-19 who are not married is a significant factor in the mean age differential between the total sample of women and the other two categories.

There are higher percentages of currently married women and women whose husbands were interviewed compared to the total sample in the North East and North West although those whose husbands were interviewed are more in the North East. The converse is true in the South East and South West. Percentages of the total sample of women in the urban areas are greater than those of the currently married women and women whose husbands were interviewed. In the rural areas however, the opposite is the case.

For education, percentages of the currently married and women whose husbands were interviewed are greater than that of the total sample of women among those with no education. For other levels of education however, percentages of the total sample are

greater than for the other two groups of women except in 2003 where percentage of the total sample of women is lesser than those of currently married women and women whose husbands were interviewed in the primary level of education.

The currently married women and those whose husbands were interviewed are comparable while these two are somewhat different from the total sample of all women interviewed with regard to the basic characteristics examined.

Table 4.1b. Percentage Distribution of All Women Interviewed by Background Characteristics, NDHS 1990.

Background	**Residence**		**Region**				
Characteristics	Urban	Rural	NE	NW	SE	SW	Total
Age group							
15-19	20.9	17.9	17.5	16.0	20.7	21.0	19.1
20-24	21.6	17.5	18.9	17.8	17.9	21.3	19.2
25-29	19.7	18.4	19.5	21.5	17.5	18.0	18.9
30-34	15.0	16.3	17.0	17.2	15.4	14.3	15.8
35-39	9.7	11.5	10.0	11.4	11.8	10.1	10.8
40-44	8.0	10.4	9.0	10.4	9.7	8.9	9.4
45-49	5.1	8.1	8.1	5.9	7.1	6.3	6.9
	$\chi^2_{(6)} = 0.000$		$\chi^2_{(18)} = 0.000$				
Education							
None	29.3	66.8	83.9	82.5	36.6	21.3	51.7
Primary	26.6	22.3	11.8	10.2	39.1	29.0	24.1
Secondary	39.0	10.2	4.2	6.8	22.5	43.7	21.8
Tertiary	5.1	0.7	0.1	0.5	1.9	6.0	2.5
	$\chi^2_{(3)} = 0.000$		$\chi^2_{(9)} = 0.000$				
Marital status							
Never married	28.5	13.2	5.8	6.5	26.7	31.4	19.4
Currently marrd	67.1	82.4	92.1	91.9	64.8	64.4	76.3
Formerly marrd	4.4	4.3	2.1	1.6	8.5	4.2	4.4
	$\chi^2_{(2)} = 0.000$		$\chi^2_{(6)} = 0.000$				
Total	3530 (40.2)	5251 (59.8)	2038 (23.2)	1699 (19.3)	2324 (26.5)	2720 (31.0)	8781 (100.0)

Table 4.1c. Percentage Distribution of All Women Interviewed by Background Characteristics, NDHS 1999.

Background Characteristics	Residence		Region				
	Urban	Rural	NE	NW	SE	SW	Total
Age group							
15-19	21.0	22.0	20.2	19.1	25.4	21.5	21.6
20-24	19.6	18.2	19.6	21.1	17.6	16.4	18.6
25-29	18.2	18.7	19.3	19.5	18.0	17.5	18.6
30-34	14.7	13.5	15.4	14.3	12.2	14.1	13.9
35-39	11.9	12.1	12.5	12.1	11.3	12.1	12.0
40-44	8.4	8.4	7.9	8.4	7.0	10.4	8.4
45-49	6.2	7.2	5.2	5.7	8.5	7.9	6.9
	$\chi^2_{(6)} = 0.278$		$\chi^2_{(18)} = 0.000$				
Education							
None	25.0	48.2	69.8	60.9	14.8	19.7	40.6
Primary	20.9	23.4	12.1	16.2	34.0	26.6	22.6
Secondary	41.5	25.2	14.3	18.3	44.1	43.9	30.5
Tertiary	12.6	3.3	3.8	4.6	7.0	9.9	6.4
	$\chi^2_{(3)} = 0.000$		$\chi^2_{(9)} = 0.000$				
Marital status							
Never married	30.4	23.6	12.9	16.7	40.7	31.5	25.8
Currently marrd	65.6	72.4	83.8	80.8	52.2	65.8	70.2
Formerly marrd	4.0	4.0	3.3	2.5	7.1	2.7	4.0
	$\chi^2_{(2)} = 0.000$		$\chi^2_{(6)} = 0.000$				
Total	2697	5502	1927	2070	2200	2002	8199
	(32.9)	(67.1)	(23.5)	(25.3)	(26.8)	(24.4)	(100.0)

Table 4.1d. Percentage Distribution of All Women Interviewed by Background Characteristics, NDHS 2003.

Background Characteristics	Residence		Region				
	Urban	Rural	NE	NW	SE	SW	Total
Age group							
15-19	22.5	23.2	22.4	19.6	25.8	23.9	23.0
20-24	19.4	19.1	16.5	20.7	20.8	19.6	19.2
25-29	18.4	17.4	17.8	19.8	16.1	17.8	17.8
30-34	12.0	12.6	13.7	12.5	10.2	12.9	12.3
35-39	11.2	10.0	12.0	10.2	9.4	9.8	10.5
40-44	8.8	9.3	9.3	9.8	8.8	8.4	9.1
45-49	7.8	8.3	8.3	7.5	8.7	7.6	8.1
	$\chi^2_{(6)} = 0.491$		$\chi^2_{(18)} = 0.000$				

Education							
None	26.5	48.1	60.5	62.4	13.6	13.5	39.4
Primary	20.8	22.6	19.2	14.9	28.3	25.6	21.9
Secondary	42.1	25.7	16.9	17.9	49.4	50.9	32.3
Tertiary	10.6	3.6	3.4	4.8	8.7	9.9	6.4
	$\chi^2_{(3)} = 0.000$		$\chi^2_{(9)} = 0.000$				
Marital status							
Never married	32.8	23.8	15.4	14.8	43.3	39.9	27.4
Currently marrd	61.2	72.0	79.2	82.2	50.3	55.8	67.7
Formerly marrd	6.0	4.2	5.5	3.0	6.4	4.4	4.9
	$\chi^2_{(2)} = 0.000$		$\chi^2_{(6)} = 0.000$				
Total	3057	4563	2384	1748	2059	1429	7620
	(40.1)	(59.9)	(31.3)	(22.9)	(27.0)	(18.8)	(100.0)

Tables 4.1b, 4.1c and 4.1d show that about three fifths of the respondents interviewed during the 1990 and 2003 NDHS are from rural areas while the proportion was higher (67%) in the 1999 survey. While the percentages of respondents interviewed are identical in the four regions in the 1999 survey, the percentages vary widely in the 1990 and 2003 surveys. Percentages of respondents interviewed in 1990 ranged from 19.3 in the North West to 31.0 in the South West while it ranged from 18.8 in the South West to 31.3 in the North East in the 2003 survey.

The percentage of women in each of the age groups decreases as age increases. This pattern is the same in general for all the surveys and by regional and residence characteristics. The exception here is the lesser number of women in age group 15-19 compared to those aged 20-24 observed in the North West in 1999 and 2003. The number of this group of women is also lower than the 20-24 years old in all the regions except South East in 1990, which is likely to be the reason why the number of the 15-19 years old is lower than the 20-24 years old in the urban areas in 1990. Over the years, the

percentage of women aged 15-19 years interviewed increased while the 25-29 and 30-34 years old decreased over the same period. Significant regional variation however exists. As regards residence, there are no significant differences in the distribution of respondents along the age groups by this characteristic [1999 - $\chi^2_{(6)} = 0.278$ and in 2003 - $\chi^2_{(6)} = 0.491$] except in 1990 where significant difference was shown ($\chi^2_{(6)} = 0.000$).

From Tables 4.1b, 4.1c and 4.1d, it is clearly shown that majority of the women (over 67%) are in stable union (both formally married and living together). The percentages of these women however, decrease over the years (from 76.3% in 1990 to 70.2% in 1999 and 67.7% in 2003) while the percentage of the never married women increase over the same period (19.4%, 25.8% and 27.4% in 1990, 1999 and 2003 respectively). This trend among the never married respondents and those in stable union is the same when marital status is examined by rural/urban dichotomy. Examination of marital status by region of residence equally follows this pattern in general. The exceptions are in the North West where there is a decrease in the percentage of the never married women between 1999 and 2003 and an increase in the percentage of married women over the same period. There is also a slight increase in the percentage of married women between 1990 and 1999 in the South West (64.4% to 65.8%).

While the trends by categories of marital status are identical, significant differences exist in the percentages of women in these categories between rural and urban areas as well as among the regions (as confirmed by the chi squared statistics in Tables 4.1b, 4.1c and 4.1d). For example, 67.1% of respondents in urban areas are in stable union in 1990 compared to 82.4% in the rural areas. These decrease to 61.2% and 72% respectively by

2003. Likewise, 92.1% of respondents from the North East compared to 64.8% from the South East are in stable union in 1990. These went down to 79.2% and 50.3% by 2003. It is also note worthy to mention that the percentage of formerly married women increased over time in the North East and North West, decreased over time in the South East and of no stable pattern in the South West as well as in the urban and rural areas.

Respondents with no education and those with primary level of education decrease over the survey periods while respondents with secondary and tertiary education levels increased. Despite the noted decline, percentage of respondents with no education stands at about 40% by 2003 (as Tables 4.1b, 4.1c and 4.1d show). Percentages of respondents with no education decreased in all cases except between 1999 and 2003 for urban respondents and respondents from the North West. There is an increase in the percentage of respondents with primary level education over time in the North East and North West while the reverse is true in the South East and South West. Some of the backlog of respondents brought about by the decline in the percentages with no education obviously achieved primary level education in the North. Increase in the percentage of respondents with secondary level education cut across the residence and regional divides. This is also true for tertiary level of education except in the urban areas between 1999 and 2003 where there is a drop from 12.6% to 10.6% while the percentage remains the same (for higher level of education) between 1999 and 2003 in the South West.

Between regions and residence, the disparities observed in the other characteristics persist. Percentages of respondents with no education in 1990 are 29.3 and 66.8 in the

urban and rural areas, respectively. These went down to 26.5% and 48.1% respectively in 2003. Thirty-nine percent had secondary level education in the urban areas in 1990 compared to 10.2% in the rural areas. This gap was however substantially closed by 2003 where the percentages are 42.1 and 25.7 respectively. At regional level, 83.9% of respondents from the North East had no education compared to 21.3% in the South West in 1990. These went down to 60.5% and 13.5% respectively by 2003. Respondents with tertiary level of education are 0.1% in 1990 in the North East and 6.0% in the South West. By 2003, the percentages are 3.4 and 9.9 respectively.

4.2. FERTILITY LEVELS AND TRENDS

4.2.1. CURRENT FERTILITY

The most widely used measure of current fertility is the total fertility rate (TFR), which is the average number of children that a woman would have by the end of her reproductive span if current age specific fertility rate (ASFR) were to remain unchanged. ASFRs are calculated by dividing the number of births to women in a specified age group during a specified time period by the number of woman-years of exposure during the same period. Using the number of woman-years of exposure in the denominator gives a good estimate of the ASFRs as the differentials in the ages of the women within the five-year age group is taken into account here. The TFR at a specified time is then calculated by summing the ASFRs for five-year age groups and multiplying by 5. Five-year ASFRs and TFRs are presented in Tables 4.2.1a, 4.2.1b and 4.2.1c for 1990, 1999 and 2003 respectively by some of the respondents' characteristics. Five-year rates are calculated to level out (to the

extent possible) the omission of births observed (two to three years before the 1999 survey) in the 1999 data.

Table 4.2.1a. Age Specific Fertility Rates (ASFR) [per 1000 women] and Total Fertility Rates (TFR) for the five years preceding the 1990 NDHS.

	15-19	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**TFR**
Residence								
Urban	66	142	252	261	185	119	60	5.43
Rural	161	232	283	267	216	139	93	6.95
Region								
North East	227	255	264	229	173	130	88	6.83
North West	248	253	302	283	233	138	110	7.84
South East	72	179	279	279	205	123	72	6.05
South West	35	125	242	270	208	138	74	5.46
Education								
None	268	249	283	259	210	137	86	7.46
Primary	100	233	314	296	206	136	79	6.82
Secondary	36	120	225	242	171	77	60	4.65
Tertiary	-	20	110	227	152	-	-	2.55
Marital Status								
Never	6	11	16	15	67	200	-	1.58
Currently	291	260	296	270	210	139	90	7.78
Formerly	200	233	204	187	140	82	37	5.41
Total	117	191	270	265	205	132	83	6.32

Table 4.2.1b. Age Specific Fertility Rates (ASFR) [per 1000 women] and Total Fertility Rates (TFR) for the five years preceding the 1999 NDHS.

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
Residence								
Urban	47	133	207	236	171	75	42	4.57
Rural	124	175	241	239	204	111	57	5.75
Region								
North East	197	215	260	247	207	150	66	6.71
North West	160	198	240	226	199	89	51	5.82
South East	36	97	209	233	204	90	54	4.61
South West	34	124	213	246	162	78	43	4.50
Education								
None	267	252	276	234	198	107	53	6.94
Primary	93	189	252	259	198	97	53	5.70
Secondary	20	97	196	246	207	91	84	4.71
Tertiary	-	33	101	179	133	32	-	2.39
Marital Status								
Never	11	12	9	28	44	89	-	0.97
Currently	284	248	266	253	202	105	59	7.09
Formerly	209	194	184	157	73	29	18	4.33
Total	100	161	230	238	193	99	52	5.37

Table 4.2.1c. Age Specific Fertility Rates (ASFR) [per 1000 women] and Total Fertility Rates (TFR) for the five years preceding the 2003 NDHS.

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
Residence								
Urban	70	124	238	237	191	115	43	5.10
Rural	110	197	287	265	221	133	51	6.31
Region								
North East	183	246	313	288	233	140	56	7.29
North West	118	224	299	276	222	132	53	6.63
South East	37	98	220	220	193	102	41	4.56
South West	30	90	206	209	160	130	37	4.31
Education								
None	233	282	320	285	228	129	52	7.65
Primary	105	210	302	261	214	136	47	6.37
Secondary	29	97	222	222	168	134	14	4.43
Tertiary	-	22	121	159	169	59	28	2.79
Marital Status								
Never	13	16	23	20	17	-	-	0.44
Currently	260	275	308	275	217	135	53	7.62
Formerly	169	195	206	159	84	72	15	4.51
Total	94	167	267	254	208	126	48	5.82

It is shown in Tables 4.2.1a, 4.2.1b and 4.2.1c that the TFR for the country as a whole dropped from 6.32 (children per woman) in 1990 to 5.37 in 1999 and then moved up again to 5.82 in 2003. This downward and then upward trend in the country's TFR between 1990 and 2003 is also observed for the sub groups in the country except the consistent downward trend observed for the never married women and women from the South East and South West. For instance, the TFR for women from the South East declined from 6.05 in 1990 to 4.61 in 1999 and 4.56 in 2003.

While the fertility trend in the country and the various groupings seem to follow a similar course, there are wide variations among the various groupings in the country. Number of births per woman is consistently higher in rural areas than in the urban. The differential in fertility between respondents with lower and higher level of education; currently married respondents and the never married as well as between the North and South are particularly marked. For example, there is a difference of about five children per woman between respondents that had no education and those with tertiary (higher) level of education in 1990 while the difference is about two children between women from the North West and those from the South West during the same year. Similar margin of differences are found between the never married and the currently married respondents (five children) and between urban and rural (about two children), respectively. The pattern is the same among the groupings in 1999 and 2003. The TFR between rural and urban however falls to one child per woman in 1999 and 2003 while the difference between the never married and currently married widened to six and seven children per woman in 1999 and 2003, respectively. There is also a difference of about three children

per woman between the North East and the South West in 2003. The South West has the lowest TFR among the regions for all the surveys.

Figures 4.2.1a to 4.2.1e below show the trend in the age specific fertility rates between 1990 and 2003 for Nigeria as a whole and by place of residence, region of residence, education and marital status sub groupings. The figures basically depict the differentials in the three sets of surveys viz: 1990, 1999 and 2003 NDHS. They also show the normal fertility trend along age groups whereby fertility increases gradually from the early ages, peak between age groups 25-29 and 30-34 and thereafter follow a downward trend.

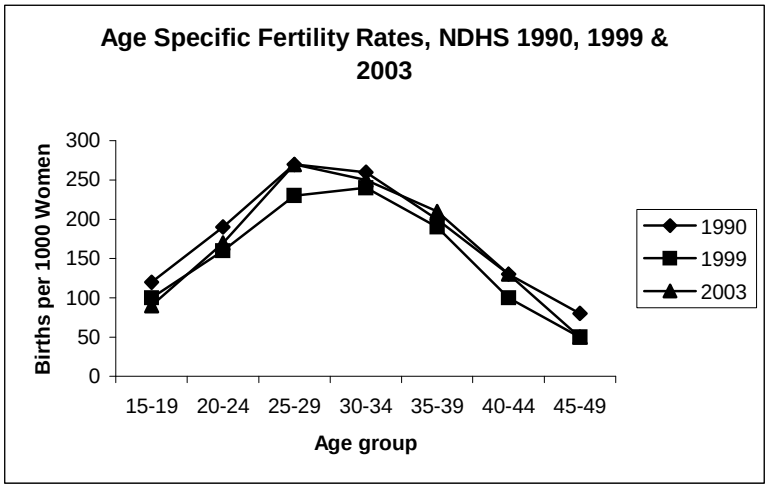


Figure 4.2.1a. Age Specific Fertility Rates in the total sample of women, NDHS 1990, 1999 &2003.

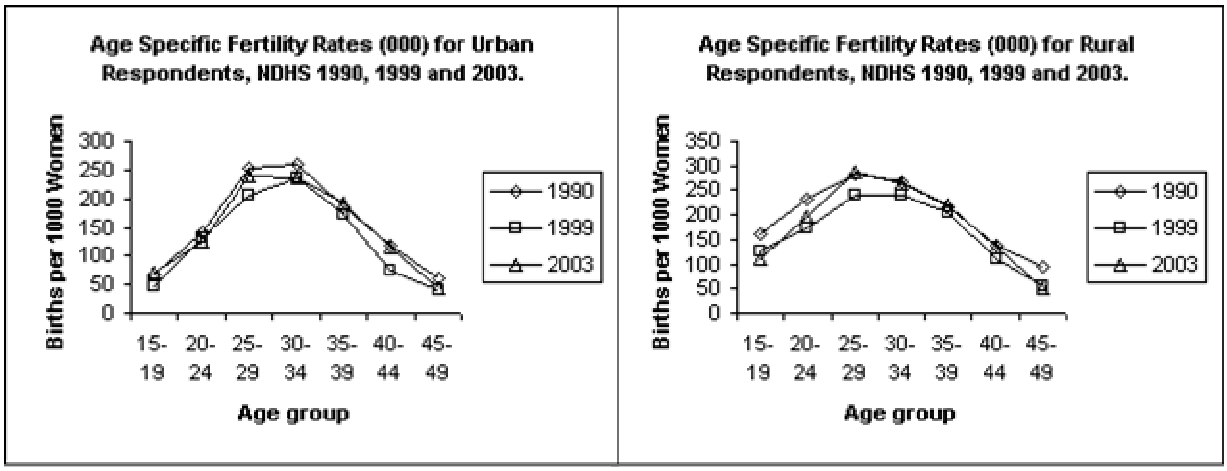


Figure 4.2.1b. Age Specific Fertility Rates by Residence

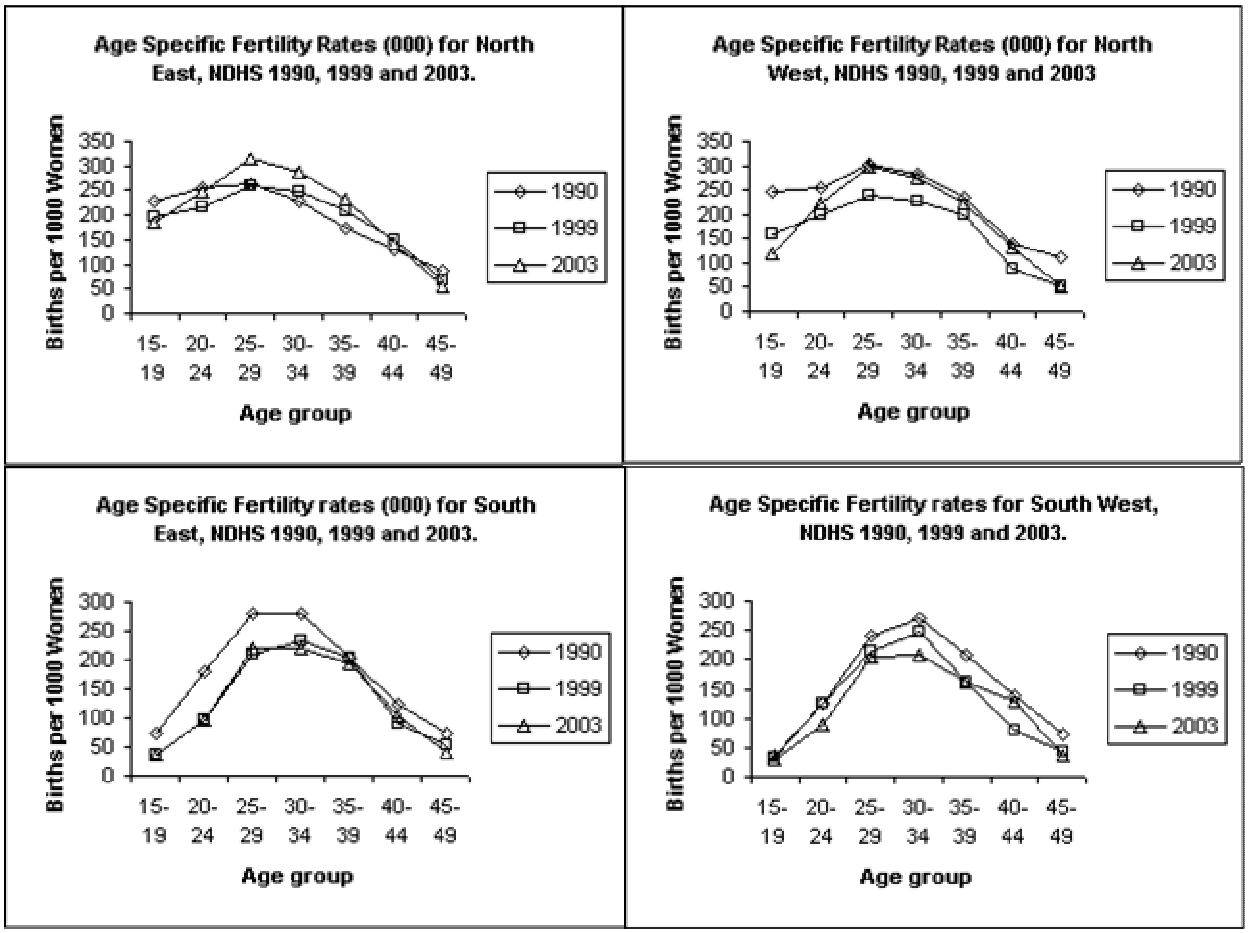


Figure 4.2.1c. Age Specific Fertility Rates by Region

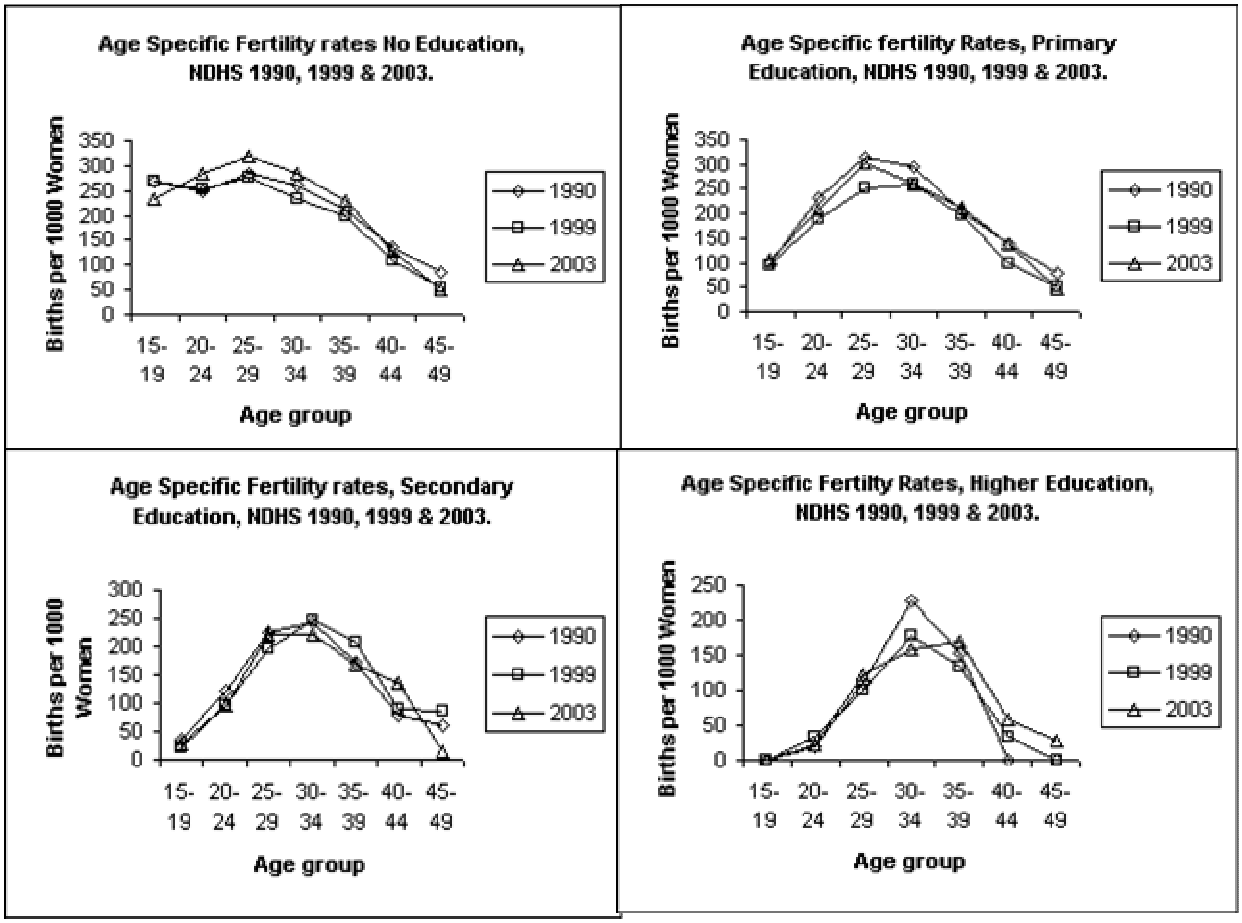


Figure 4.2.1d. Age Specific Fertility Rates by Education

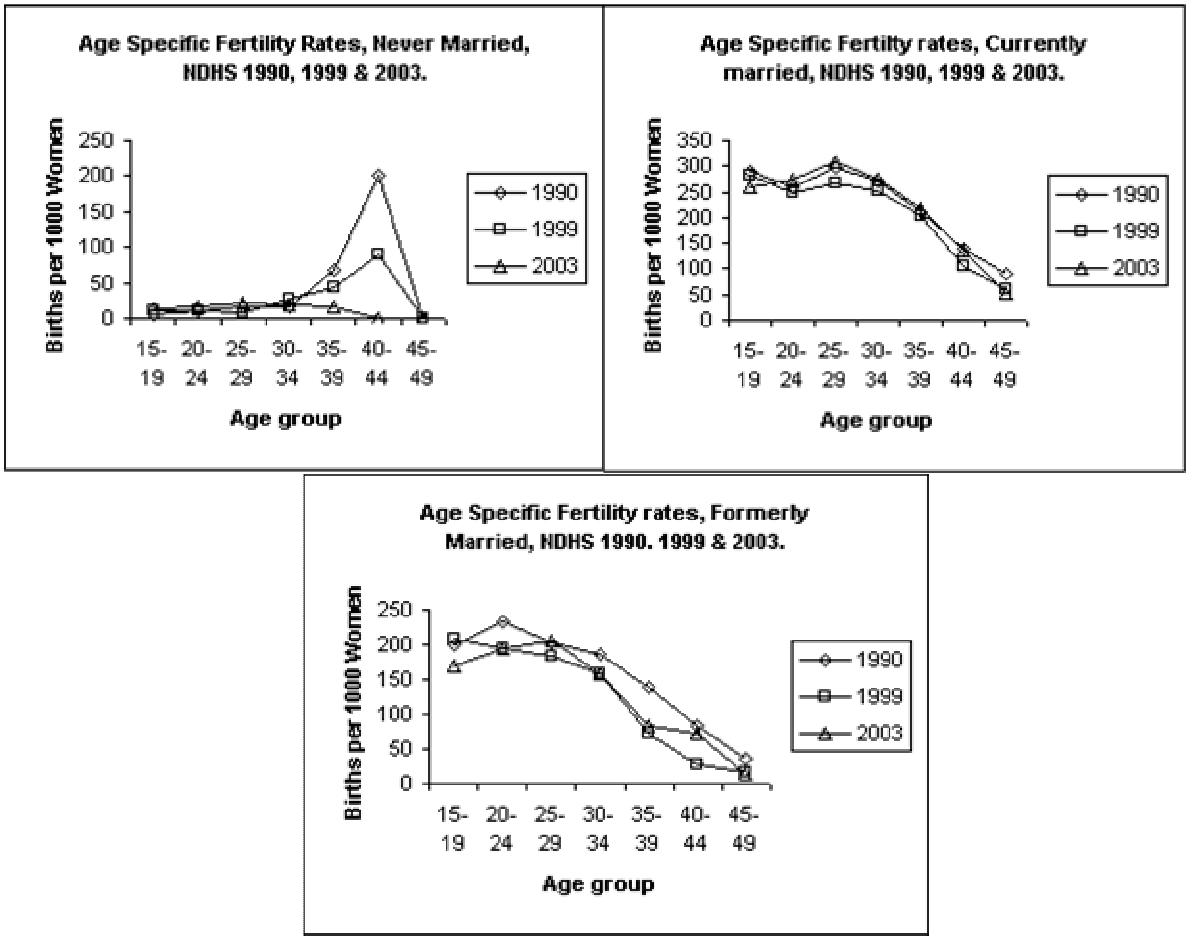


Figure 4.2.1e. Age Specific Fertility Rates by Marital Status

As discussed using the TFRs, the figures show that in general, the age specific fertility rates along the age groups are highest in 1990 followed by 2003 and then 1999. The consistent fall in fertility rates among respondents from the South East and South West and the never married are also shown in Figures 4.2.1c and 4.2.1e respectively. The peaks observed among the never married plots of 1999 and 2003 at age group 40-45 could be due to small number of women in the age band. The sub groups with high fertility are also clearly shown by the ASFR plots. In this group are respondents with no education,

currently married and formerly married, those from the North East and North West. The shape of the fertility curves of these groups of women is almost negatively linear, which shows a high level of fertility at the early ages contrary to expectation (the norm).

4.2.2 INDIRECT TECHNIQUES OF ADJUSTING ESTIMATES OF FERTILITY.

Although direct estimates of fertility measures are possible from census, survey data and registration of vital events (as seen in section 4.2.1 above), they often underestimate the true level of fertility owing to omission of events (and occasionally, overcounts) or misunderstanding of the length of the reference period in survey questions on births during a previous period. Because of reference period errors, age specific fertility rates calculated from surveys are also occasionally overestimated. The most commonly used approach to adjust these rates is the indirect measurement of fertility (United Nations (Manual X), 1983; Arriaga, 1994). Retrospective data on mean number of children ever born (MCEB) and births during the last year (BLY) by age of the women at enumeration time are used to yield adjusted estimates of current age specific fertility rates (ASFR) and the total fertility rate (TFR). In this section, the P/F ratio, Arriaga's technique and the relational Gompertz technique are explored with a view to adjusting the ASFR and TFR estimates of the 1990, 1999 and 2003 National Demographic and Health Survey (NDHS) data sets.

4.2.2.1. P/F Ratio Technique

This technique was originally developed by William Brass and further developed with and by his associates, Coale (1968) and Trussell (1974). The technique adjusts an age specific fertility pattern to a level of fertility derived from the information on children ever born. These cumulated fertility rates denoted by (F) are adjusted and compared with the children ever born (denoted by P). To effect this adjustment, Brass simulated the average number of children ever born per woman and the cumulative fertility by using a third degree polynomial. After the adjustments, the P/F ratio (usually of the 20-24 years or the 25-29 years) is then used to adjust the fertility pattern to the level indicated by the children ever born. [$Fi = \Phi_i + k_i f_i$; $\Phi_i = 5\Sigma$ fs for s =1 to i-1 and k is a set of multipliers derived by Brass through simulation].

The P/F ratio technique assumes that the completeness of data from which the age specific fertility rates are calculated is the same for all age groups of women; that the reporting of the average number of children ever born per woman is complete at least up to ages 30 or 35 years; that there is no age misreporting of women in the childbearing years and that the pattern and level of fertility have not changed during the 10-15 years prior to the census or survey.

A summary of the TFR estimated from the adjusted ASFRs using the original Brass method and the PFRATIO (the Trussell variant in Population Analysis Spreadsheet – PAS) are given in Table 4.2.2 below. See appendix 4a for details of calculation.

Table 4.2.2. Observed and Adjusted Total Fertility Rate Estimates derived by various adjustment techniques.

Method	1990	1999	2003
Observed (calculated from raw data)	6.32	5.37	5.82
Brass P/F (Original)	6.70	6.07	6.08
PFRATIO (PAS)	6.80	6.06	6.28
ARFE2 (2 points in time)	6.21	5.55	N/A
ARFE2 (2 points in time)	N/A	6.96	7.17
ARFE3 (3 points in time)	-	-	-
FERTCB	6.48	6.50	7.09
FERTCB (2 points in time)	5.54	5.55	N/A
FERTCB (2 points in time)	N/A	8.43	8.87
FERTPF	6.85	6.23	6.71
FERTPF (2 points in time)	6.33	5.79	N/A
FERTPF (2 points in time)	N/A	6.15	6.55
Relational Gompertz	6.19	6.04	5.86

NOTE: PFRATIO (PAS) – Trussell variant of the P/F ratio. Estimated using the population analysis spreadsheet; ARFE2 & ARFE3 – Arriaga's two and three points estimates in population analysis spreadsheet; FERTCB – Arriaga's estimate using only data on children ever born in MORTPAK; FERTPF – Arriaga's estimate using data on children ever born and age specific fertility pattern in MORTPAK.

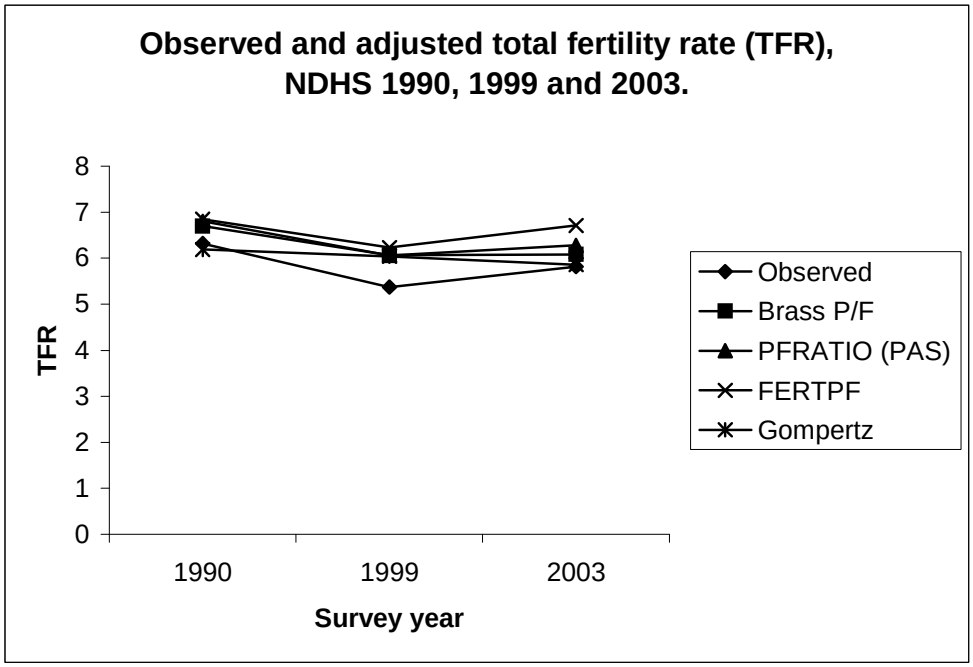


Figure 4.2.2. Observed and adjusted TFR derived by some indirect techniques

4.2.2.2. Arriaga's Technique.

Arriaga (1983) later modified the Brass P/F method and extended it to the case of changing fertility. Rather than transforming the recorded age specific fertility pattern (ASFP) figures to CEB-type figures, he suggested transforming the recorded CEB data into estimates of age-specific fertility. Based on a simulation model, he observed that under conditions of declining fertility, the number of children ever born by age of mother changes almost linearly for mother's ages under 35 years. The technique is basically designed for use where information is available for two or three periods of time. It can also be used when information on the average number of children ever born by age of mother and pattern of fertility are available for only one date but in this case, the assumption of constant fertility in the past 10-15 years hold.

The approach involves the following (i) to obtain average number of children ever born for women exact age x at the time of the first and second enumeration [$CEB_x(t_1)$ and $CEB_x(t_2)$] through graduation by a ninth degree polynomial, on the data on children ever born in five-year age groups recorded in each enumeration; (ii) to estimate children ever born at exact age x for the year after the first census [$CEB_x(t_1+1)$] and the year before the second census [$CEB_x(t_2-1)$] by linear interpolation between $CEBx(t_l)$ and $CEBx(t_2)$ for every age x; (iii) to calculate single-year age-specific fertility rates for the one-year period following the first census as $f_x^1 = CEB_{x+1}(t_l+1) - CEBx(t_1)$ and for the one-year period preceding the second census as $f_x^2 = CEB_{x+1}(t_2) - CEBx(t_2-1)$; (iv) to ensure that the age-specific fertility rates at older ages decrease monotonically and exponentially to zero at age 50, adjust the estimated single-year age-specific fertility rates at ages 40 and

over by assuming that $f_x^i = f_{39} + (1 - f_{39})^{(x-39)/11} - 1$; and, finally, (v) to calculate age-specific fertility rates in conventional five-year age groups for each time period by taking the arithmetic average of the single-year age-specific fertility rates within each five-year age group (Arriaga, 1983).

There are four underlying assumptions. One, it assumes that completeness in the recording of births in the last 12 months is the same for all age groups of women. Secondly, that the average number of children ever born per woman is reported accurately for women under 30 or 35 years of age and thirdly, that there has been no age misreporting of women in childbearing ages. In addition, this technique assumes that changes in fertility will produce a linear change in the average number of children ever born per woman at each single year of age of women between the two reporting dates. The Arriaga estimates are presented in Table 4.2.2 above as FERTCB and FERTPF (in MORTPAK) and ARFE2 (in PAS) estimating each date separately and between two points in time. ARFE3 (in PAS) is meant to measure between the three points but did not work because the intervals between the surveys are not the same.

4.2.2.3. Relational Gompertz Technique

This technique was proposed by Brass (1974) and developed by Booth (1979) and Zaba (1981) for the evaluation and adjustment of fertility estimates obtained from retrospective reports of birth histories or its features. The technique uses the Gompertz function to estimate fertility since it follows closely the pattern of the cumulative fertility rates. The estimates are based on information on the average number of children ever born per

woman by 5-year age groups of women in childbearing ages and also on age specific fertility rates of children born during the year prior to the census or survey if available.

The Gompertz function is:

$F_{(x)} = F*A\ (\exp B^{x})$ …… 1

where $F_{(x)}$ represents the cumulative fertility up to age x or the average number of children per woman by age of the woman from census or survey information; F is the total fertility rate; A and B are constants and x represents age. In the formulation, the double exponential function is transformed into a linear one by taking logarithms twice.

$Y_{(x)} = -\ln[-\ln (F_{(x)}/F)] = a + bx$ ……. 2

In addition, an age scale transformation is performed to obtain a better fit of the Gompertz function to the actual data.

$Y_{(x)} = a + bY_s(x)$ …….. 3

where a and b are constants reflecting the fertility patterns of the population in question. The ‘s’ denotes the transformation for a standard age specific fertility schedule and $Y_{s(x)}$ represents standard value.

Brass proposed two procedures for fitting equation 3 above. In one, the Gompertz parameters are estimated using parity data and in the second, both lifetime and current fertility data are used. These are presented in equations 4 and 5 respectively.

$Z(i) = -\ln [-\ln(Pi/Pi+1)]$ ……. 4

$Z(x) = -\ln [-\ln(Fx/Fx+1)]$ …….. 5

Where i refers to the five year age groups (1,2,…, 7) and x refers to age (20, 25,…, 50). The estimates of a and b are then obtained by fitting the approximate relations as follows:

$Z(i) – ei = a' + b'gi$ ……. 6

$Z(x) – ei = a' + b'gx$.

The values of ei, ex, gi and gx are based on the standard fertility schedule that is chosen.

The technique assumes that the average number of children ever born per woman by age of the women follows the pattern of a Gompertz function; that the reporting of the average number of children ever born per woman by age of women is complete and represents the level of cumulative fertility up to each age group and that the completeness of reporting of children born during the last 12 months prior to the census or survey is the same for all age groups of women(Arriaga, 1994). The Gompertz estimates of the TFR is also presented in Table 4.2.2 and extract of calculation using the REL-GMPZ in PAS is in appendix 4b.

With the exception of FERTCB 2-points in time estimate, all the other TFR estimates are similar to the observed in 1990 while the Brass P/F, PFRATIO and the relational Gompertz estimates are similar to the observed TFR in 2003. These three common estimates could be taken to a reasonable extent as acceptable adjustments of the observed values.

However, the estimates become erratic, dissimilar to the observed and inconsistent with reality (especially when sample size is small) when the data is broken down into sub

groups to examine differentials among groups. For example, a TFR of 0.31 was derived for respondents with tertiary level of education; 0.26 for never married respondents and estimate of 5.4 (which is much lower than the estimate of 6.19 for the total sample of women) for currently married respondents.

It should also be noted that these techniques were developed between late sixties and early eighties. A number of contemporary issues, top of which is HIV/AIDS that has effect on fertility levels were not factored into their derivation. In addition, deviations from the assumptions of the techniques certainly occur in the data sets, which has effect on the estimates derived.

In view of the foregoing, the observed fertility estimates will be used in the analysis of this work mainly because this work examines differentials among groups in all the analysis carried out and will not be possible if the adjusted values of ASFR/TFR are assumed. It is however important to note that the 1990 and 2003 estimates are similar to the adjusted estimates derived using these various methods.

4.2.3. LIFETIME FERTILITY

The mean number of children ever born (CEB), which is one of the summary measures of overall fertility is presented in Table 4.2.3. The mean number of children for the country as a whole followed the downward and then upward trend exhibited by the TFR. It was 3.20 in 1990, 2.84 in 1999 and 3.02 in 2003. While most of the sub groups follow the irregular trend shown at the national level, mean number of children ever born declined over the survey periods for respondents in age groups 15-19 and 20-24 and respondents

in the South East and South West. These aggregate values however masked the great variation among the various groupings in the country. Table 4.2.3 shows that the mean number of children ever born are generally lower in the urban areas than in the rural areas; in the South than in the North; among respondents with secondary and tertiary levels of education than those with lower level of education and among then ever married than the ever married respondents.

Table 4.2.3. Mean Number of Children Ever Born by Some of the Background Characteristics of Respondents, NDHS 1990, 1999 and 2003.

	1990	1999	2003
Age group			
15-19	0.29	0.25	0.23
20-24	1.34	1.12	1.10
25-29	2.88	2.51	2.70
30-34	4.52	3.93	4.24
35-39	5.56	5.25	5.77
40-44	6.18	5.94	6.43
45-49	6.57	6.35	6.99
Residence			
Urban	2.69	2.52	2.72
Rural	3.55	2.99	3.23
Region			
North East	3.34	3.23	3.69
North West	3.52	2.92	3.44
South East	3.37	2.66	2.51
South West	2.76	2.58	2.15
Education			
None	4.14	3.91	4.45
Primary	3.12	3.19	3.29
Secondary	1.23	1.36	1.35
Tertiary	1.70	1.85	1.77
Marital Status			
Never married	0.078	0.091	0.070
Currently married	3.92	3.79	4.15
Formerly married	4.48	3.84	3.97
Total	3.20	2.84	3.02

4.2.4. COMPARISON OF LIFETIME AND CURRENT FERTILITY

A comparison of the measure of lifetime childbearing with current fertility gives a rough indication of the trend in fertility over time. The parity/total fertility ratio (P/F ratio) is an analytical tool for examining fertility changes. Table 4.2.4 below presents the mean number of children ever born, the cumulative ASFR and the P/F ratios (along age groups).

Table 4.2.4. Lifetime (CEB) and Current (ASFR) Fertility Rates

	1990			1999			2003		
	CEB	**ASFR**	**P/F**	**CEB**	**ASFR**	**P/F**	**CEB**	**ASFR**	**P/F**
15-19	0.29	0.59	0.49	0.25	0.50	0.50	0.23	0.47	0.49
20-24	1.34	1.54	0.87	1.12	1.30	0.86	1.10	1.31	0.84
25-29	2.88	2.89	1.00	2.51	2.45	1.02	2.70	2.64	1.02
30-34	4.52	4.22	1.07	3.93	3.64	1.08	4.24	3.91	1.08
35-39	5.56	5.24	1.06	5.25	4.61	1.14	5.77	4.95	1.17
40-44	6.18	5.90	1.05	5.94	5.11	1.16	6.43	5.58	1.15
45-49	6.57	6.32	1.04	6.35	5.37	1.18	6.99	5.82	1.20

ASFR – Cumulated along age groups

The ASFR are greater than the CEB for the first two age groups of 15-19 and 20-24 after which mean number of children ever born takes the upper hand. This is reflected in the P/F ratios where the ratios are less than one for the two lower age groups and greater than one for the others. Figures 4.2.4a to 4.2.4d show the relationships between these two measures of fertility further.

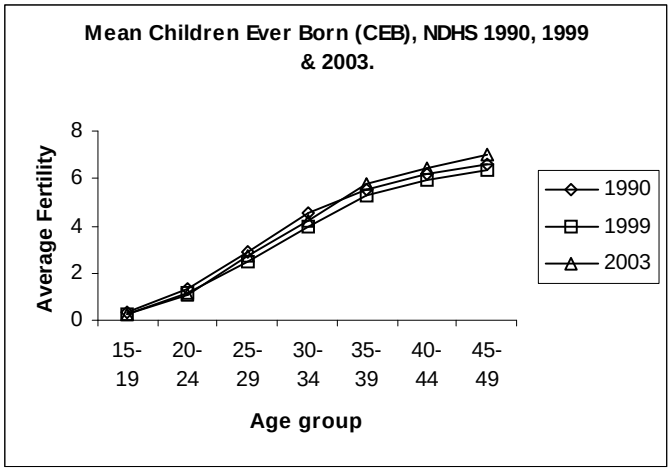


Figure 4.2.4a. Mean Children Ever Born, NDHS 1990, 1999 & 2003.

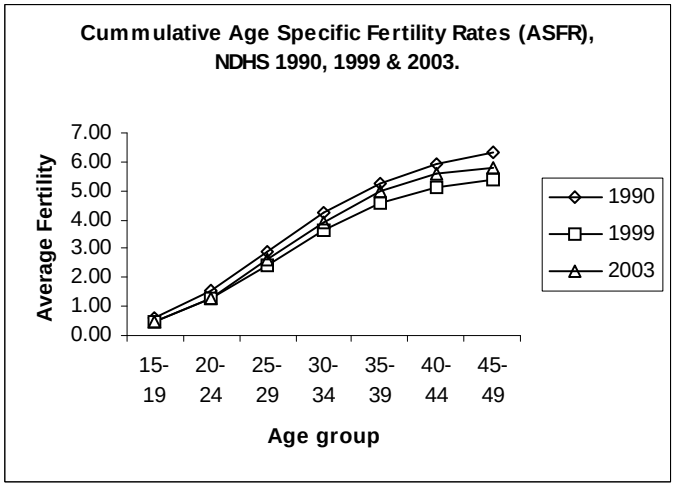


Figure 4.2.4b. Cumulative Age Specific Fertility Rates, NDHS 1990, 1999 & 2003.

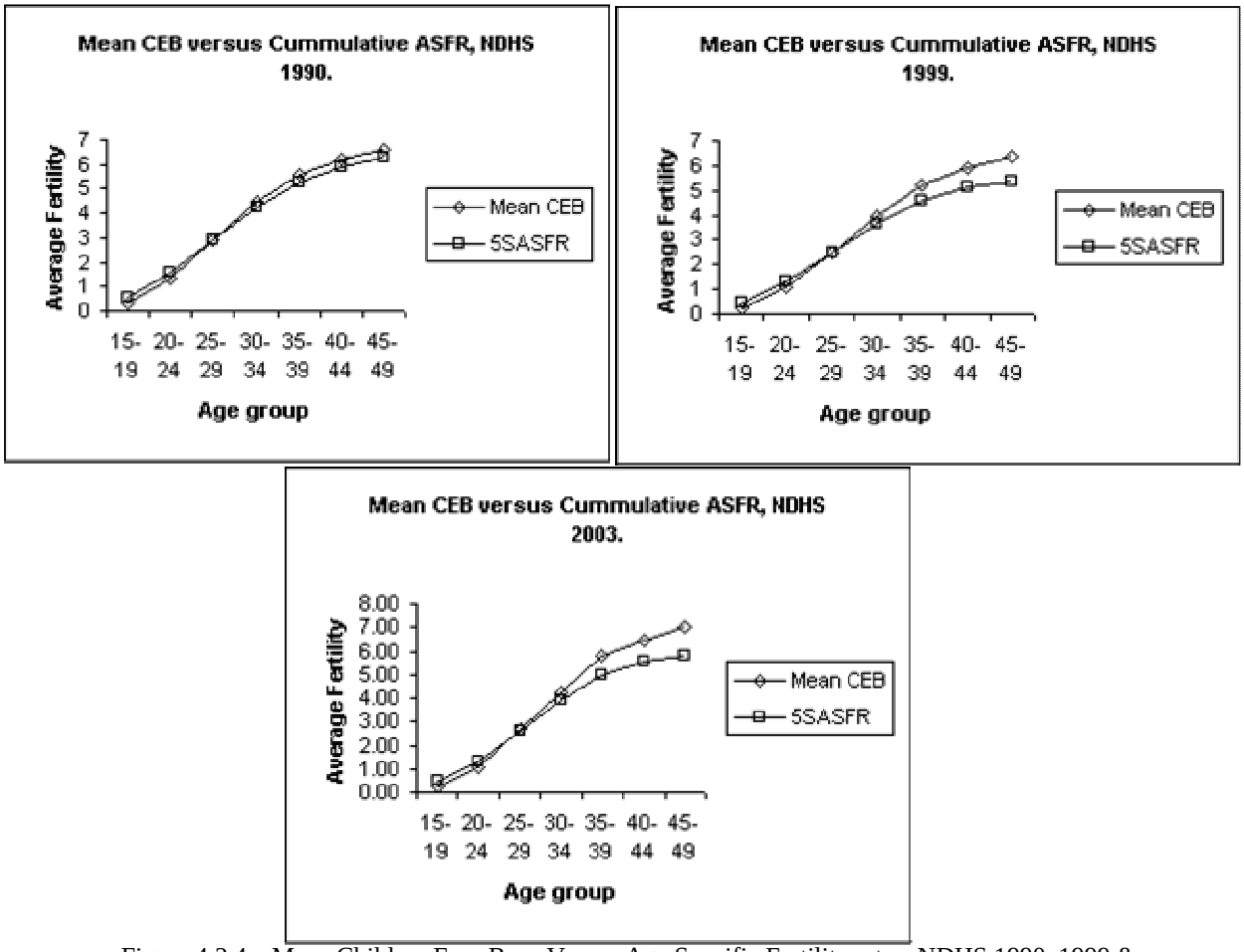


Figure 4.2.4c. Mean Children Ever Born Versus Age Specific Fertility rates, NDHS 1990, 1999 & 2003.

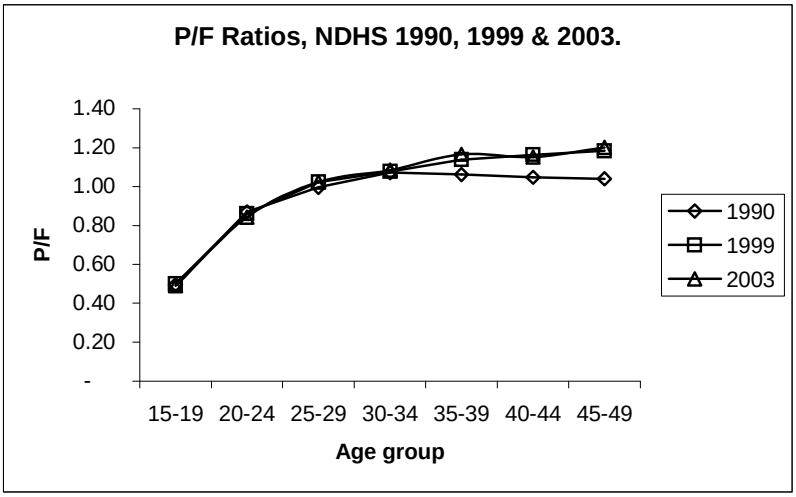


Figure 4.2.4d. P/F Ratios, NDHS 1990, 1999 & 2003.

Figure 4.2.4a shows that on the average, mean number of children is lowest in 1999 as noted in section 4.2.3. Nineteen ninety- nine also has the lowest cumulative ASFR among the surveys (Figure 4.2.4b). Figure 4.2.4c shows that mean number of children ever born is higher (in particular in the higher ages) than the cumulated ASFRs. Figure 4.2.4d shows that in 1990, there was not much difference between the two measures especially at older ages (P/F ratio close to one) while the difference takes a slow but steady upward trend in 1999 and 2003. This rising trend in the P/F ratios by age of women suggests that fertility has been declining in the recent past.

4.2.5. AGE AT FIRST AND LAST BIRTH

4.2.5.1. Age at first birth

The age at which childbearing begins is very important in the study of fertility transition as it influences the number of children a woman bears in her reproductive life in the absence of any control. Examining the age at first birth across women of different age groups should provide an indication of the trend in this regard. The median age at first birth is used in this analysis because the normality diagnostics tests carried out show that the data is skewed to the right (i.e. not normally distributed and statistically, the median is a better measure of central tendency in such a case). See appendix 3a for details. Although the age at first birth is estimated for the 15-19 years group, it will not be interpreted nor discussed, as the upper age limit in the group is even lesser than age at

first birth for some respondents. Including it in discussing results or as a yard stick for comparability is likely to be biased.

Table 4.2.5.1 shows that median age at first birth is actually declining across age groups (i.e. women are now having their first births at an earlier age). In 1990, women aged 45-49 had their first birth at about the age of 20; those aged 30-34 had theirs at age 18 while women aged 20-24 had theirs at age 17. A decline of three years in the age at first birth is also noticed in the 1999 survey between age groups 45-49 and 20-24 while for the other age groups in between these two, age at first birth remains 19 years. However, no definite pattern across the age group in 2003 is observed and it basically remains at (18 years) the same level.

The observed increase and constancy in age at first birth across age groups, which can be interpreted as increase or a stall in age at first birth over time is confirmed by the median age at first birth for the total sample of women aged 20-49 for the three set of survey. This is 19 years in 1990 and 1999, which thereafter decline to 18 years in 2003. This result is surprising but the three different methods used in its estimation (the frequency distribution, Kaplan Meier and life table survival techniques) gave similar results. Although the values given by the life table are slightly higher than those derived from the other two methods, the trend and interpretation of the results are the same. The values in Table 4.2.5.1 are those derived from the Kaplan Meier method.

Table 4.2.5.1. Median Age at First Birth Among Women Aged 15-49 by Current Age and Selected Background Characteristics, NDHS 1990, 1999 and 2003.

Background characteristics	Current age of Women							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	20-49
1990								
Residence								
Urban	16	18	19	19	20	20	20	19
Rural	15	17	18	18	19	19	20	18
Education								
None	15	16	17	18	19	20	20	18
Primary	16	17	19	19	20	20	20	19
Secondary	17	19	21	20	21	21	21	20
Tertiary	-	17	22	24	22	19	24	23
Region								
North East	15	16	17	17	19	20	21	17
North West	15	17	18	18	19	18	20	18
South East	16	18	19	18	19	18	19	19
South West	17	19	20	20	20	20	20	20
Total	16	17	19	18	20	20	20	19
1999								
Residence								
Urban	16	18	20	20	20	19	20	19
Rural	15	17	18	19	19	18	19	18
Education								
None	15	16	18	18	18	18	19	18
Primary	16	18	19	19	19	18	20	19
Secondary	16	19	20	21	21	20	21	20
Tertiary	-	21	23	23	23	23	23	23
Region								
North East	15	16	18	18	17	18	20	17
North West	15	17	18	19	19	17	18	18
South East	16	18	19	19	20	19	19	19
South West	16	19	20	21	20	20	20	20
Total	15	17	19	19	19	19	20	19
2003								

Residence								
Urban	16	18	20	19	18	19	18	19
Rural	16	17	18	18	18	18	19	18
Education								
None	16	17	17	17	17	17	18	17
Primary	16	18	19	18	18	18	18	18
Secondary	17	19	20	21	21	21	20	20
Tertiary	-	21	22	22	23	23	20	22
Region								
North East	16	17	18	17	17	17	17	17
North West	16	17	18	18	17	17	18	17
South East	17	19	20	19	18	19	19	19
South West	16	19	21	21	21	20	20	20
Total	16	18	19	19	18	18	18	18

Table 4.2.5.1 also shows that the median age at first birth is higher among women that reside in the urban areas, higher among respondents from the South compared to the North and generally increases with increase in level of education of the respondents. Median age at first birth increased in the total sample of women aged 20-49 in 1999 from 18 years among those with no formal education to 23 years among those with tertiary level of education. The five-year difference in age at first birth between respondents with no formal education and those with tertiary level of education is also observed in 1999 and 2003.

4.2.5.2. Age at last birth

Age at last birth of respondents that want no more children is examined by its pattern over time to have an idea of the trend in the childbearing periods of women when it (age at last birth) is considered together with age at first birth. Table 4.2.5.2a below gives the median age at last birth across age groups. Percentage will however be interpreted from age 30 as the fluctuation in the steady decline of the age at last birth from the last age

group could be observed around the age group of 30-34 and also, to be as close as possible to those that could be regarded as having completed their childbearing.

Table 4.2.5.2a. Median Age at Last Birth Among Currently Married Women by Current Age and Selected Background Characteristics, NDHS 1990, 1999 and 2003.

Background characteristics	Current age of Women							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	30-49
1990								
Residence								
Urban	-	22.25	26.33	30.42	33.42	36.58	38.42	33.92
Rural	-	21.42	25.92	30.42	35.00	37.67	40.42	36.00
Education								
None	-	21.42	26.00	30.25	35.08	37.75	38.92	36.17
Primary	-	21.83	26.00	30.50	33.50	37.67	40.42	35.58
Secondary	-	21.50	26.25	30.25	32.67	35.92	39.0	33.00
Higher	-	-	25.33	28.17	30.83	33.83	37.0	32.75
Region								
North East	-	21.42	26.17	30.42	35.00	37.92	38.5	35.08
North West	-	21.25	26.00	30.25	33.92	35.50	36.33	34.00
South East	-	22.25	26.25	30.25	34.00	37.50	38.58	35.67
South West	-	21.83	25.83	30.50	33.42	37.25	40.92	35.83
Total	-	21.50	26.00	30.42	33.75	37.42	38.92	35.05
1999								
Residence								
Urban	-	20.83	26.83	31.17	32.83	35.42	37.92	33.92
Rural	-	22.08	25.58	30.42	33.58	36.33	38.42	35.75
Education								
None	-	20.08	25.58	30.00	33.25	36.00	38.42	35.83
Primary	-	20.83	26.92	30.42	33.25	36.42	38.17	35.58
Secondary	-	22.08	25.58	31.17	35.08	35.83	39.10	33.00
Higher	-	-	27.00	31.17	32.75	35.88	37.00	33.50
Region								
North East	-	20.83	25.58	31.17	33.08	37.33	38.75	35.25
North West	-	20.08	26.92	31.42	32.58	36.00	38.67	35.25
South East	-	-	25.92	30.42	35.08	36.00	38.17	35.92
South West	-	22.5	26.33	30.92	32.83	35.75	38.00	34.00
Total	-	22.08	29.58	34.67	33.25	36.00	38.17	35.33
2003								

Residence								
Urban	-	22.08	27.00	31.08	35.25	36.92	37.67	35.92
Rural	-	21.67	27.17	31.17	35.17	36.83	38.08	36.00
Education								
None	-	22.08	25.17	30.58	35.08	37.50	38.67	37.17
Primary	-	21.08	27.25	31.25	35.50	36.00	37.42	35.17
Secondary	-	22.67	27.08	31.33	35.33	37.25	36.42	33.42
Higher	-	-	28.92	31.75	35.08	36.67	32.75	35.00
Region								
North East	-	22.25	27.50	31.33	35.50	37.67	40.00	36.42
North West	-	-	25.33	30.25	34.00	36.58	38.33	36.42
South East	-	21.08	27.08	31.08	35.00	36.92	37.83	35.83
South West	-	20.08	27.17	31.75	35.67	36.67	36.58	35.67
Total	-	22.08	27.08	31.17	35.17	36.83	38.00	36.00

In the total sample of women, age at last birth decreased over the years (looking at it from the highest to the lowest age group) except between age groups 35-39 and 30-34 where it increased in 1999. The median ages are 38.17, 36.00, 33.35 and 34.67 for respondents aged 45-49, 40-44, 35-39 and 30-34 years respectively in 1990 (see Table 4.2.5.2a for the 1990 and 2003 median ages). Median age at last birth for the total sample of women aged 30 to 49 however increased by one year between 1990 and 2003. Although the variation among the levels of the various sub groups examined is not much, there is a mix in the trend within the sub groups and over the years. It can be said from the age at last birth of the combined women aged 30-49 that: age at last birth is higher in the rural areas and among respondents with less than secondary level of education.

Table 4.2.5.2b. Differences in the median ages at first and last birth in the total sample by age group.

	30-34	**35-39**	**40-44**	**45-49**
1990	12.42	13.75	17.42	18.92
1999	15.67	14.25	17.00	18.17
2003	12.17	17.17	18.83	20.00

Table 4.2.5.2b shows that the number of years spent in childbearing has been declining across age groups (over time) but increased over the survey years for the last three age groups. For instance, respondents aged 45-49 years in 1990 spent 18.92 years in childbearing while this was 12.42 years among women aged 30-34 years in the same survey year. The table also shows that most respondents spend less than half of the 35 years reproductive span in actual child bearing. Number of years spent however does not necessarily translate into the number of children born between the periods as factors such as length of birth interval comes to play.

4.2.6. NON-MARITAL FERTILITY

Although childbearing is only socially acceptable within marital union in many African settings, it is a fact that a certain percentage of childbearing occurs outside the union. Many fertility studies often concentrate on marital fertility whereas the non-marital fertility forms part of the overall observed fertility levels in any society and hence its importance in any fertility study. Non-marital fertility includes that of the never married women as well as the formerly married (divorced, separated and widowed) women. These two groups are quite distinct as far as marital experience is concerned and this is expected to translate into a difference in their childbearing pattern.

Emphasis will be placed more on the never married population in this study because the childbearing of the formerly married women could have occurred while they were in union and may therefore not be a good proxy for non-marital fertility.

Table 4.2.6. Percentage of Never and Formerly Married Women Who Have Ever Given Birth by Selected Background Characteristics.

Background Characteristics	Never married			Formerly married		
	1990	1999	2003	1990	1999	2003
Age group						
15-19	1.4	2.2	2.9	53.8	50.0	52.2
20-24	5.4	5.0	7.6	97.2	82.9	86.4
25-29	14.1	7.1	14.2	94.5	88.0	93.5
30-34	30.8	12.3	17.6	95.7	89.4	90.7
35-39	55.6	27.8	25.0	96.0	98.0	92.1
40-44	-	44.4	33.3	97.0	89.8	92.0
45-49	-	83.3	33.3	97.2	96.2	93.7
Residence						
Urban	3.5	2.2	5.0	96.2	88.9	89.7
Rural	5.3	5.6	6.6	91.7	89.4	89.1
Education						
None	7.5	12.2	7.4	94.2	83.8	89.8
Primary	4.2	8.0	9.3	91.0	95.5	92.1
Secondary	3.6	2.6	4.7	97.9	90.4	87.8
Tertiary	6.8	2.0	5.9	83.3	93.3	82.1
Region						
North East	4.2	5.6	3.3	83.7	76.6	81.5
North West	2.7	3.5	6.6	82.1	86.5	94.3
South East	6.5	5.6	6.7	94.9	92.9	93.9
South West	2.8	2.4	5.8	97.4	96.3	91.8
# of surviving children						
0	0.4	0.4	0.4	16.7	25.5	18.4
Total number	4.2	4.3	5.8	93.5	89.3	89.4

From Table 4.2.6 above, the percentage of never married women that have been giving birth to children in the total sample has been increasing over time. It rose from 4.25% in 1990 to 5.80% by 2003. Non-marital fertility among the never married is positively related to age and its incidence is particularly high from the age of 30 years. It is also found to be higher in the rural areas compared to the urban in all the survey years. The pattern is mixed within and among education and regional categories except in the North West where it increased consistently over the years (2.7, 3.5 and 6.6 percents in 1990, 1999 and 2003 respectively). Non-marital fertility among women with no surviving

child(ren) is small (0.4% in all the years). This percentage also implies that these women have experienced the death of at least one child.

4.2.7. TEENAGE PREGNANCY AND MOTHERHOOD

Early childbearing among teenagers is of social and public health concern for it exposes the young women and the foetuses to higher risk of morbidity and mortality. It is also often a threat to socio-economic development of the women and has demographic implications for the population as a whole (Ibisomi, 2004). One of the targets of the National Policy on Population of Nigeria (FGN, 1988; 2004) was to reduce pregnancy in women below the age of 18 years. It is therefore important to examine the distribution, level and trend of teenage pregnancy and motherhood across the various divide in Nigeria.

Table 4.2.7 shows that about one-fifth of teenagers are mothers by the age of 19 years. There is however a decline in the percentage of teenage mothers over the years. The percentages are 21.5, 18.6 and 18.0 in 1990, 1999 and 2003 respectively. Percentage of teenage mothers is positively associated with age in the surveys while the opposite is the case with level of education. None of the teenagers that had tertiary level of education in the three surveys are mothers or pregnant with a first child. The percentage of teenage mothers in the rural is much higher than that of the urban. This is also the case between teenagers from the North and those from the South although there is a general decline over the years among the regions.

Table 4.2.7. Percentage of Teenagers that are Mothers and Those Pregnant for the First Time by Selected Characteristics

Background characteristics	1990		1999		2003	
	Mothers	First pregnancy	Mothers	First pregnancy	Mothers	First pregnancy
Age						
15	7.0	3.4	8.0	3.2	3.1	3.0
16	14.3	5.8	7.9	2.0	10.5	3.1
17	23.6	7.0	20.4	7.6	22.0	6.3
18	30.0	6.3	28.2	4.0	24.4	6.9
19	36.2	5.7	29.8	6.3	32.4	5.7
Residence						
Urban	12.8	3.0	9.5	2.9	15.6	3.4
Rural	28.4	7.9	22.8	5.2	20.8	6.0
Education						
None	45.4	15.1	50.2	15.7	41.1	15.8
Primary	17.8	5.7	16.3	5.3	17.7	3.3
Secondary	7.4	1.3	3.9	1.1	6.5	2.1
Tertiary	-	-	-	-	-	-
Region						
North East	39.9	15.0	36.9	11.8	21.6	9.3
North West	41.3	10.7	30.1	6.2	23.7	7.7
South East	13.7	3.1	7.3	1.7	8.6	2.7
South West	7.2	1.9	6.0	2.0	5.3	0.9
Total	21.5	5.5	18.6	4.4	18.0	4.9

In terms of percentage of teenagers that are pregnant with their first child, no definite pattern is observed within the sub groups or over the years. When added with the percentages of those that are already mothers, the pattern is similar to what is observed for the teenage mothers. Figure 4.2.7 depicts clearly the observed differentials in teenage motherhood by some of the teenagers' characteristics. Teenage childbearing is lowest in the South West, among teenagers with tertiary (higher) level of education (0% in all survey years) and expectedly among the 15 years old. The lower percentages in the urban compared to the rural are also shown.

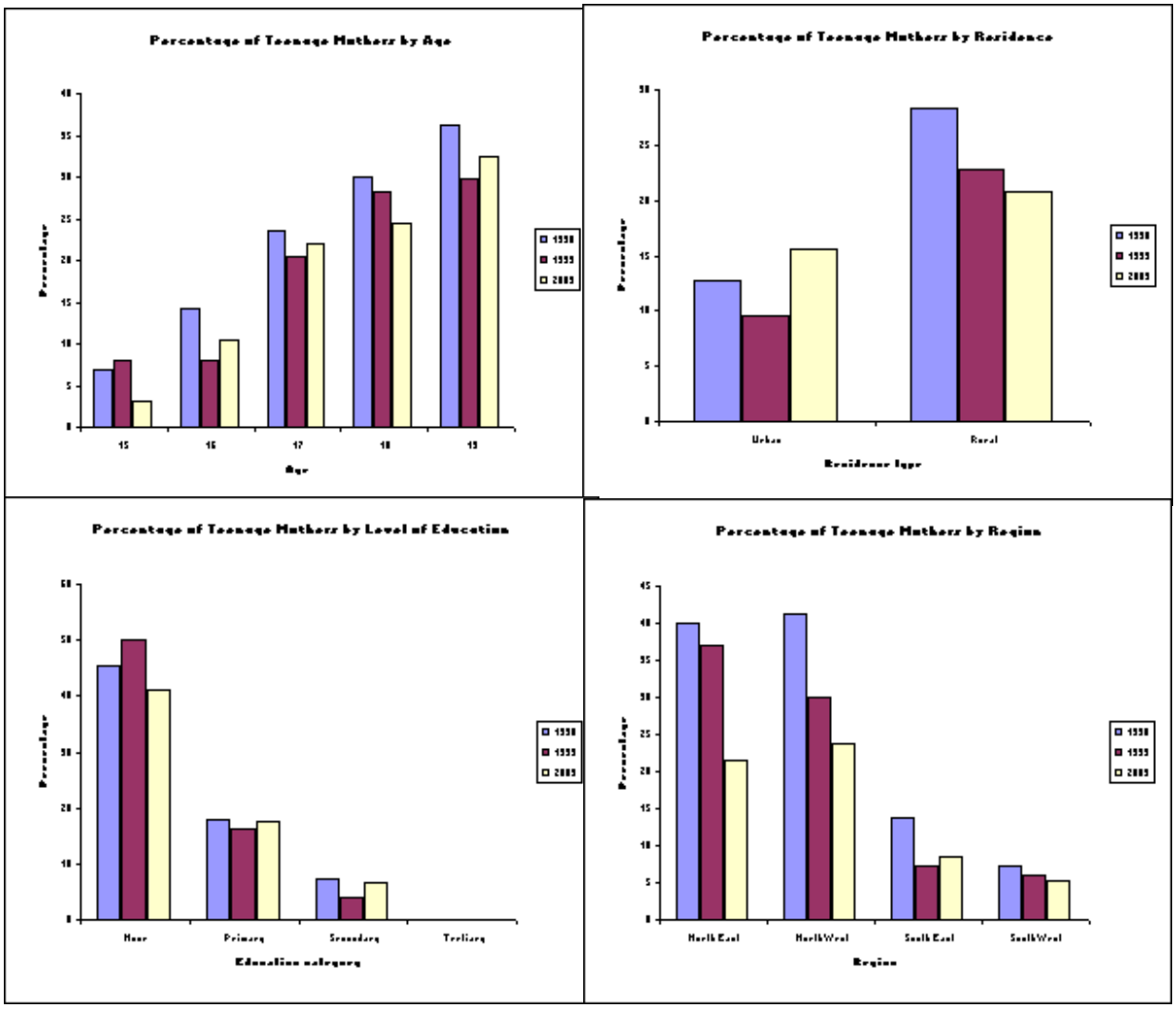


Figure 4.2.7. Percentage of Teenage Mothers by Selected Characteristics

4.2.8. PARITY PROGRESSION RATIOS

Parity Progression ratios (PPR) give trends, patterns and changes in childbearing. It measures the proportion of women in a given cohort and of a given parity that progress to the next parity. The measure is usually problematic at younger ages as they are more strongly affected by changes in the timing of births and represent incomplete maternity histories. Between 1990 and 2003, the number of women in the total sample that

progressed from parities 0 to 1 and 1 to 2 increased over the period and thereafter, generally declined as parity increases. Although the pattern of the line graphs is similar except at the higher parities, the lowest progression ratios are found in 1999.

Table 4.2.8. Proportion of Women that Progress from One parity to the Next in the Total Sample of Women, NDHS 1990, 1999 and 2003.

Parity	1990	1999	2003
0	0.74	0.69	0.67
1	0.85	0.83	0.83
2	0.82	0.81	0.83
3	0.80	0.78	0.82
4	0.77	0.74	0.78
5	0.73	0.70	0.76
6	0.70	0.70	0.74
7	0.66	0.65	0.70
8	0.59	0.57	0.66
9	0.55	0.59	0.59
10	0.43	0.42	0.49
11	0.48	0.47	0.41
12	0.44	0.33	0.41
13	0.22	0.67	0.39
14	0.33	0.20	

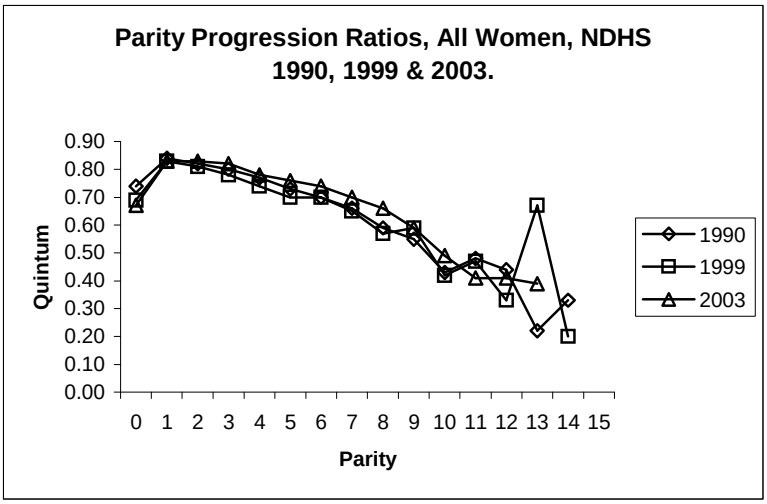


Figure 4.2.8a. Parity Progression Ratios for all Women, NDHS 1990, 1999 & 2003.

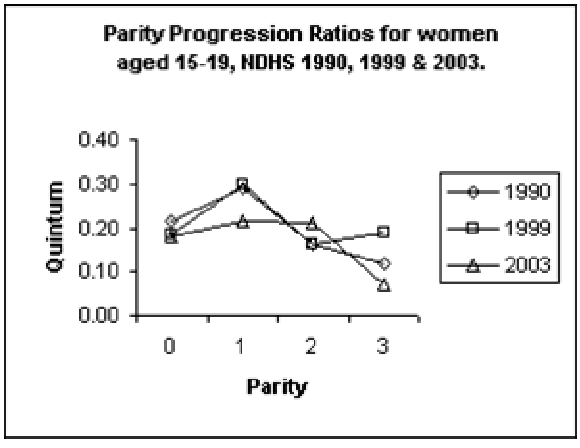
Table 4.2.8 and Figure 4.2.8a show that, the proportion of women that progress from one parity to another generally decreases as parity increases especially after parity two. This trend is not so stable at age groups 15-19 and 20-24 (due to incomplete childbearing experience) and at higher parities (for the other age groups) due to small number of women at that end, which has enormous influence on the ratios obtained. For age group 45-49, the proportion moving from one parity to the next are almost the same for all parities (not much fertility change over parity line). In the 1990 and 1999 surveys, the last parity was 15, which went down to 14 in the 2003 survey.

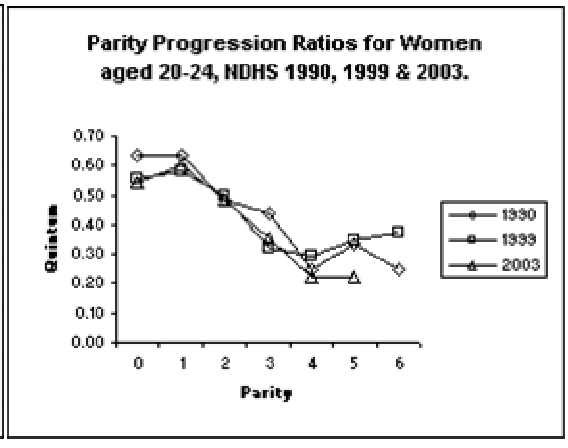
The proportions that proceed from one parity to another are higher in the rural areas than in the urban. This is shown in Figure 4.2.8c where the decline in the urban line plot is steeper than that of rural. The case is also the same for respondents from the North and South. The proportion progressing to the next parity along the ages fall more rapidly in the South than in the North. The difference in the pattern of starting between the North and South is also brought forth here. Proportion of women progressing from parities zero to one and one to two are lower in the South due to lower number of women from the South in the early age groups that bear children compared to their counterparts from the North. By 2003, the last parity is 12 in the South West while it is 14 in the other regions (i.e. the highest number of children had by respondents from the South West is lesser than that of respondents from the other regions).

The trend in proportion progressing from one parity to the other for respondents with secondary and tertiary (higher) levels of education is not well defined. However,

reduction in the number of last parity as level of education increases is noted. For example, in 1990, last parities are 15, 13, 13, and 8 for respondents with no education, those with primary, secondary and tertiary education respectively. It is also noted that contrary to the general trend, last parity increased from eight in 1990 to nine in 1999 and ten in 2003 for respondents with higher level of education.

A steady decline in the proportion progressing from one parity to the next is noted for currently married women and to some extent the formerly married women while the pattern is ill defined for never married women. A decline in the last parity is also exhibited here. For the never married, the last parity declined from ten in 1999 to five in 2003. This is 15 to 14 for the currently married and 14 to 13 for the formerly married respondents. Figures 4.2.8b to 4.2.8f below show the parity progression ratios by various characteristics of the respondents.





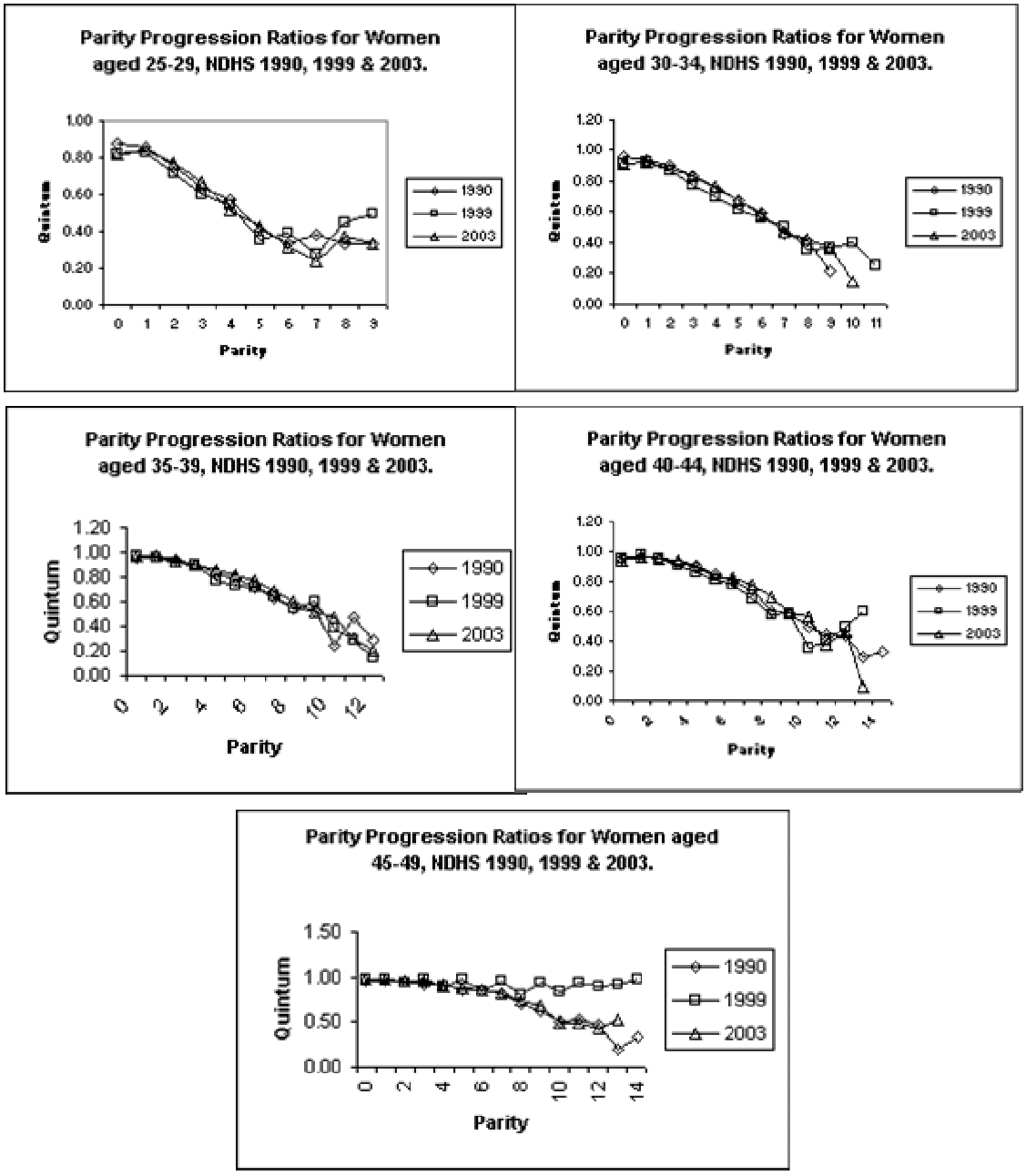
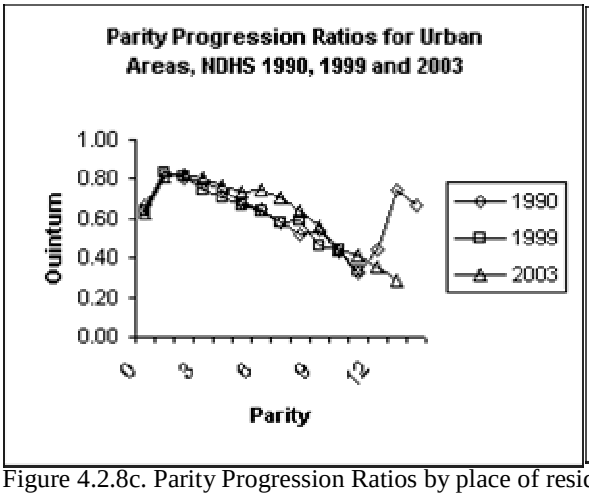


Figure 4.2.8b. Parity Progression Ratios by Age group, NDHS 1990, 1999 and 2003.



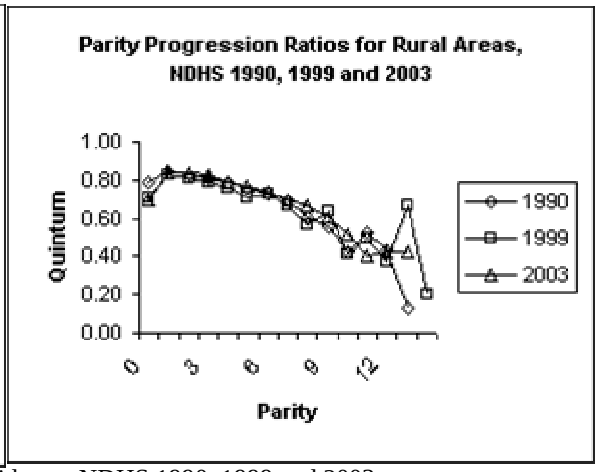
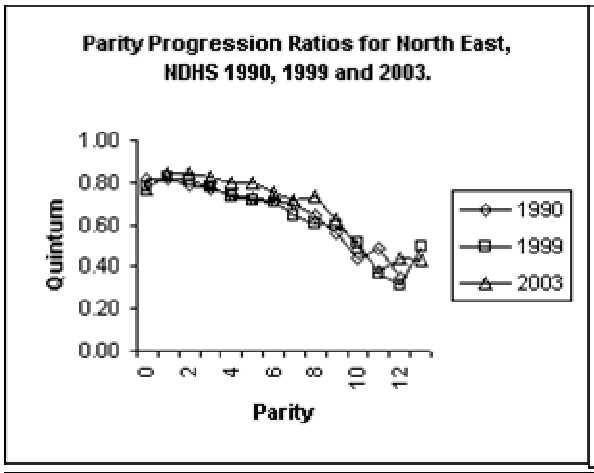
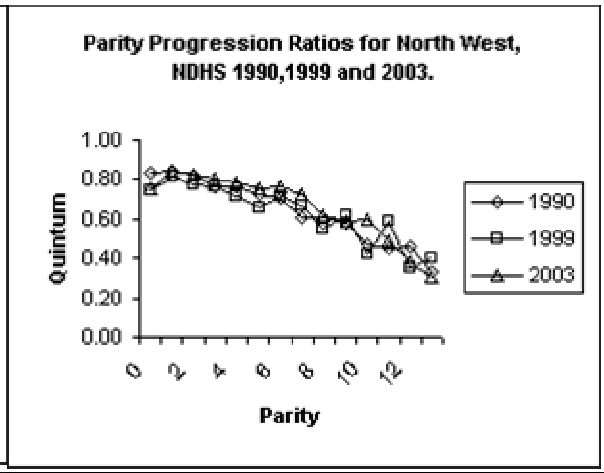
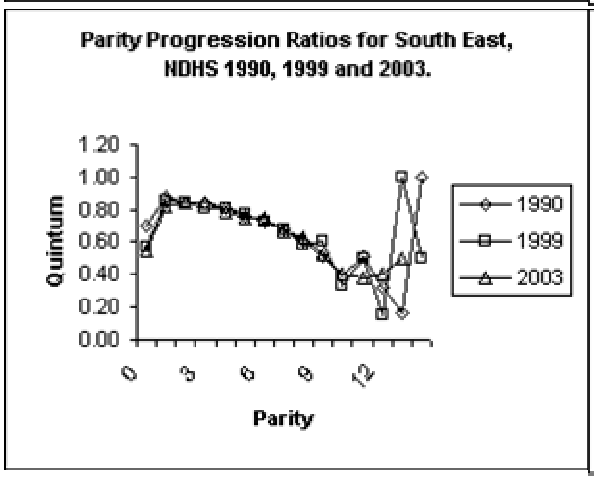


Figure 4.2.8c. Parity Progression Ratios by place of residence, NDHS 1990, 1999 and 2003.







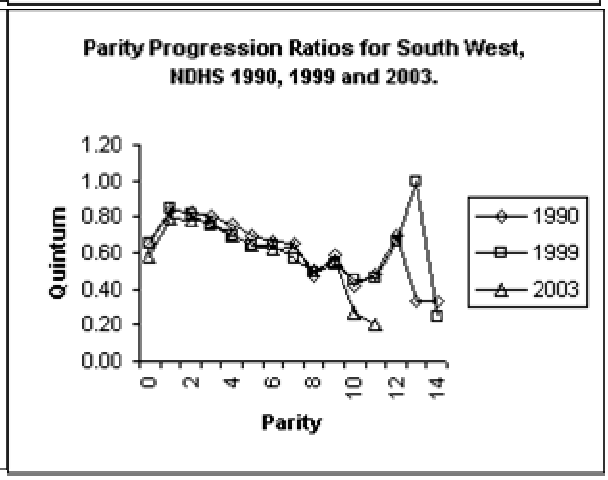


Figure 4.2.8d. Parity Progression Ratios by Region, NDHS 1990, 1999 and 2003.

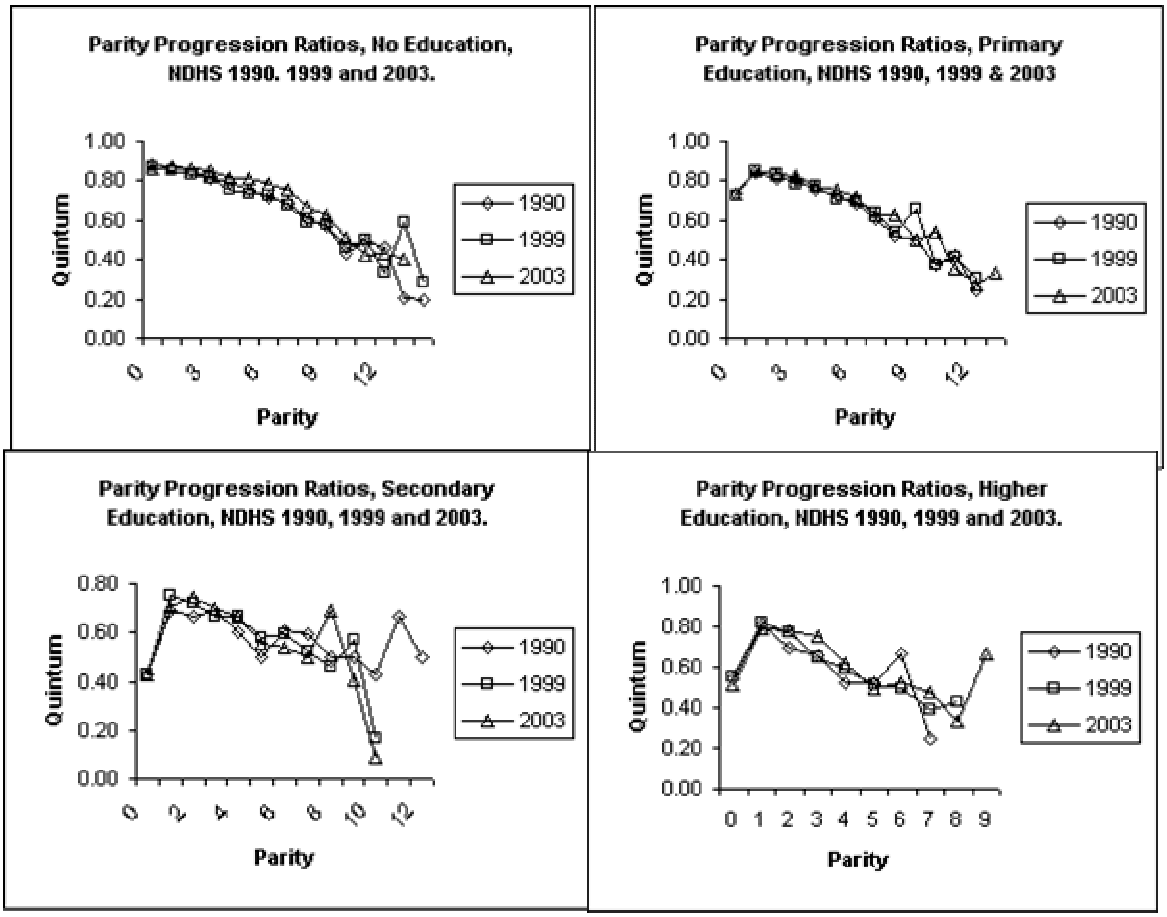


Figure 4.2.8e. Parity Progression Ratios by Education, NDHS 1990, 1999 and 2003.

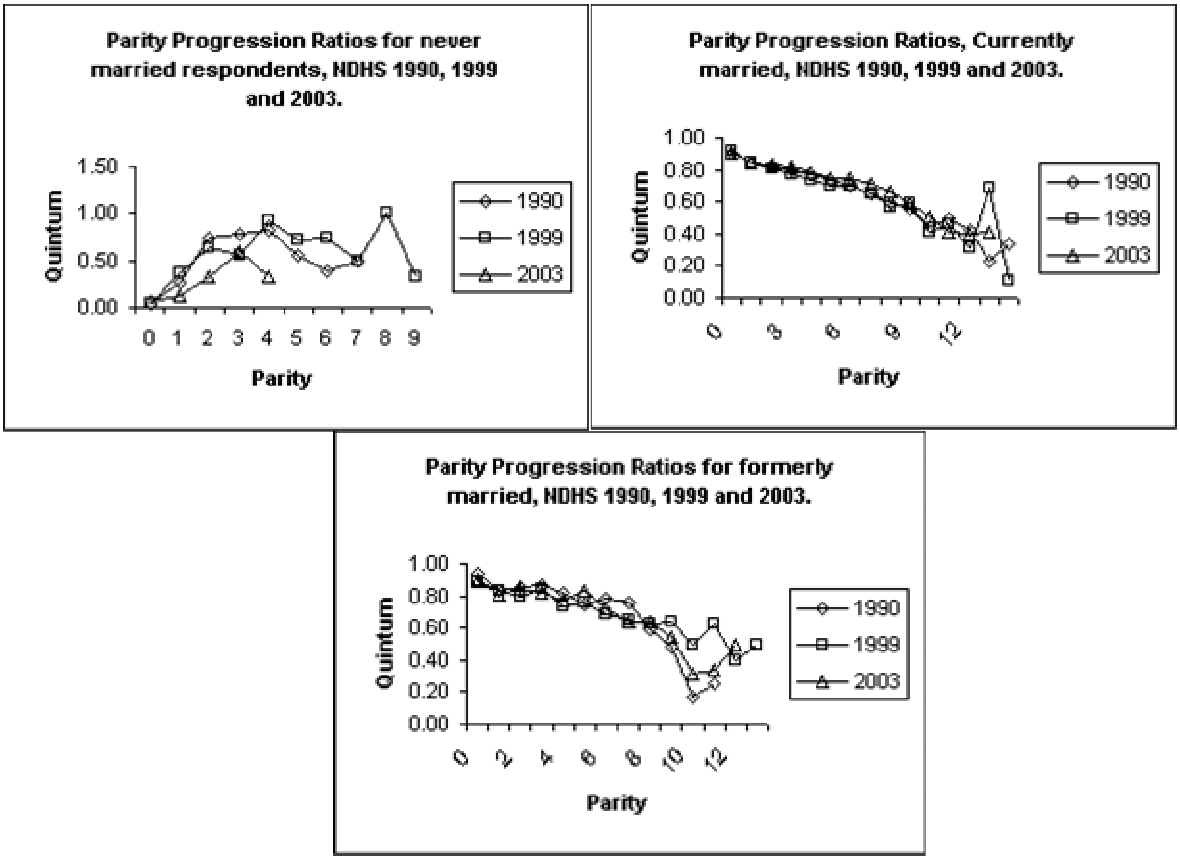


Figure 4.2.8f. Parity Progression Ratios by Marital status, NDHS 1990, 1999 & 2003

4.2.9. BIRTH INTERVALS

The length of birth interval between two successive live births has a profound influence on fertility level as it determines the number of children that women bear within the reproductive years. This analysis was therefore carried out to understand the birth spacing behaviour of respondents that had birth(s) in the five-year period before the surveys by selected background characteristics. The last closed birth interval for all the women that had births five years before the surveys were used in computation.

The Kaplan Meier survival analysis (also known as the product limit estimator) is adopted in this computation. The Kaplan Meier survival analysis is a univariate non-parametric technique for estimating time related events. It is especially applicable when length of follow-up varies from case to case and takes into account losses from the sample before the final outcome is observed. The basic computations for the survival curve rely on the computation of survival probabilities (i.e. computing the number of cases (people) who have experienced the event of study at a certain time point, divided by the number of cases in the study at that time) (Kaplan_Meier, 2006).

$$P[T \geq t_i \mid T \geq t_{i-1}]$$

where $t_1, t_2, \ldots, t_{i-1}, t_i$ represent times when event occurs.

The equation above implies, the probability of a person under observation having not experienced the event to a specific time given that the person did not experience the event to the previous time. In this case, the probability that a respondent has not given birth to another child say by month 20 after the last birth given that she did not at month 19. (i.e. did not have another child between months 19 and 20 after the last birth)

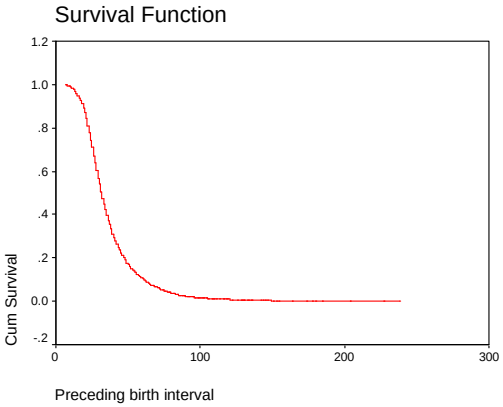
Table 4.2.9 shows that median birth lengths are similar in all the surveys. It was 32 months in 1990 and 33 months in 1999 and 2003. Median birth interval length increases as age of mother at birth of child increases. For example, this was 28 months for the 15-19 years old, 34 months for the 30-34 years old and 40 months for the 45-49 years old in 1990. As would be expected, shorter birth interval follows the death of the preceding birth compared to that of a surviving birth.

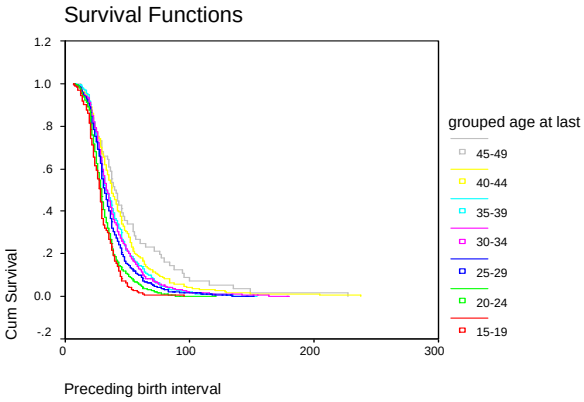
While admittedly there are some outliers, there is no (significant) difference in the length of birth interval by mothers' type of place of residence, region, level of education, marital status, birth order and sex of preceding child over the years.

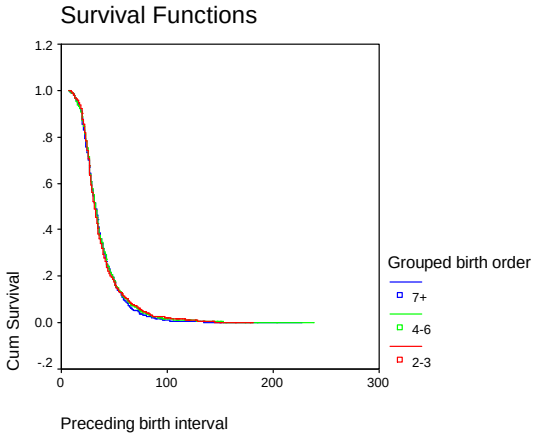
Table 4.2.9. Median length (in months) of preceding birth interval (to last child) of births that occurred five years before the surveys by some selected characteristics

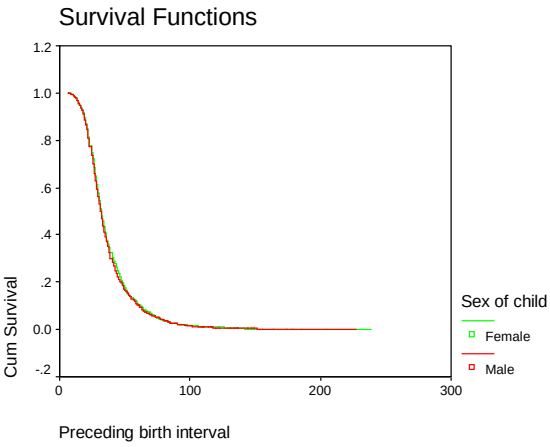
	1990	1999	2003
Age of Mother at birth			
15-19	28.0	26.0	26.0
20-24	29.0	31.0	29.0
25-29	32.0	32.0	33.0
30-34	34.0	35.0	35.0
35-39	33.0	37.0	38.0
40-44	38.0	38.0	43.0
45-49	40.0	40.0	45.0
Birth order			
2-3	31.0	33.0	32.0
4-6	32.0	34.0	34.0
7+	32.0	32.0	34.0
Sex of preceding birth			
Male	31.0	33.0	33.0
Female	32.0	33.0	33.0
Survival of preceding birth			
Dead	26.0	25.0	28.0
Alive	33.0	34.0	34.0
Residence			
Urban	31.0	34.0	33.0
Rural	32.0	32.0	33.0
Region			
North East	33.0	33.0	32.0
North West	32.0	34.0	33.0
South East	30.0	30.0	32.0
South West	32.0	36.0	36.0
Education			
None	33.0	34.0	33.0
Primary	31.0	32.0	33.0
Secondary	29.0	33.0	32.0
Tertiary	30.0	33.0	35.0
Marital status			
Never married	35.0	26.0	32.0
Currently married	32.0	33.0	33.0
Formerly married	33.0	28.0	34.0
Total	32.0	33.0	33.0

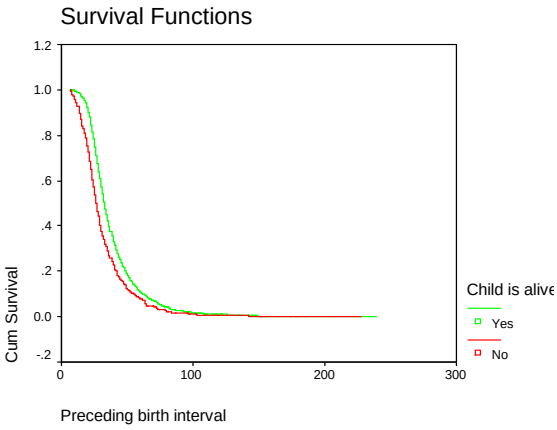
Figures 4.2.9a to 4.2.9c compare survival curves for the different categories of the selected characteristics examined in Table 4.2.9 above.

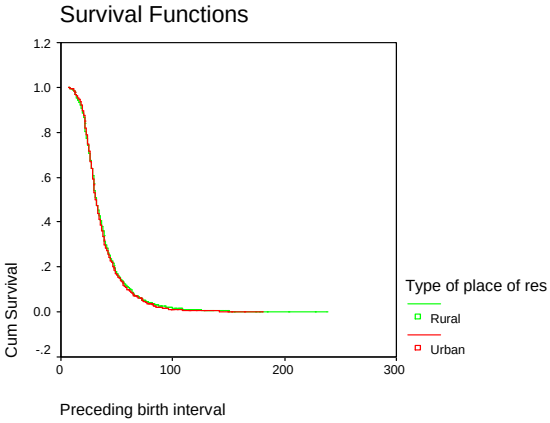


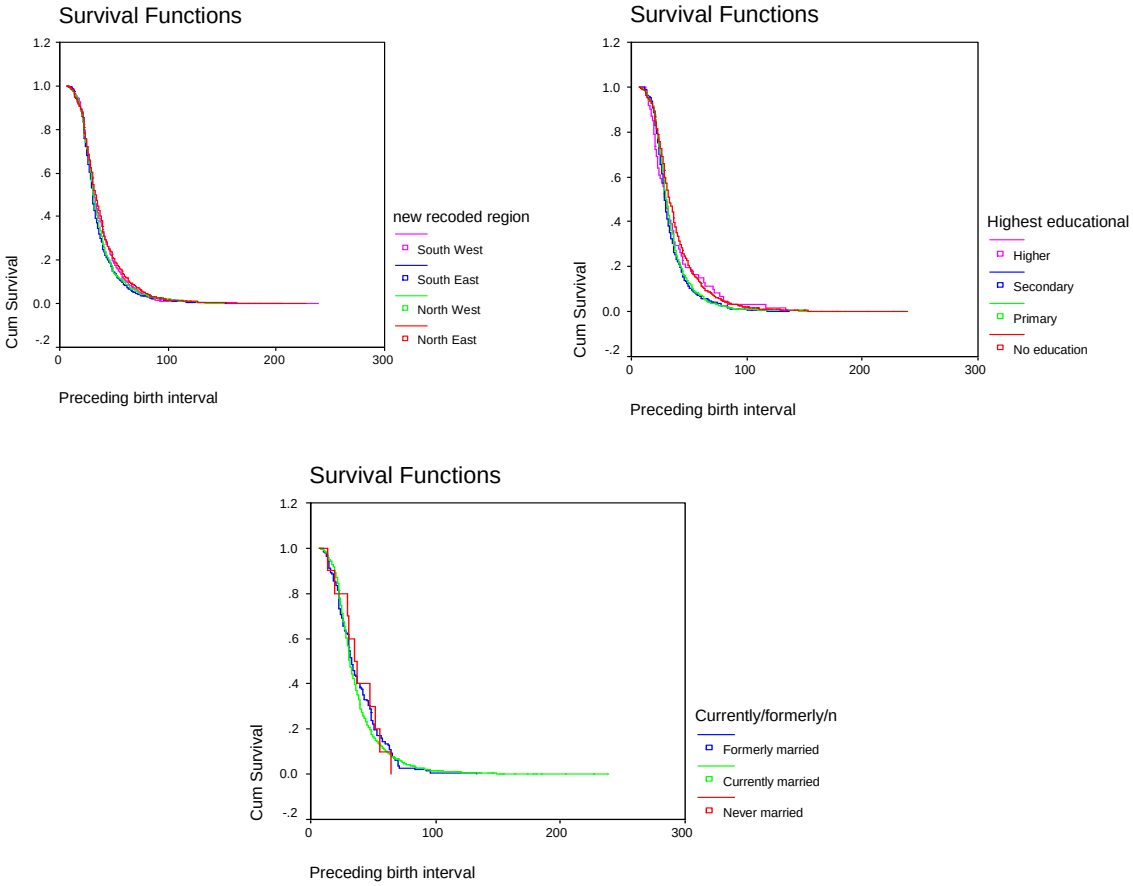




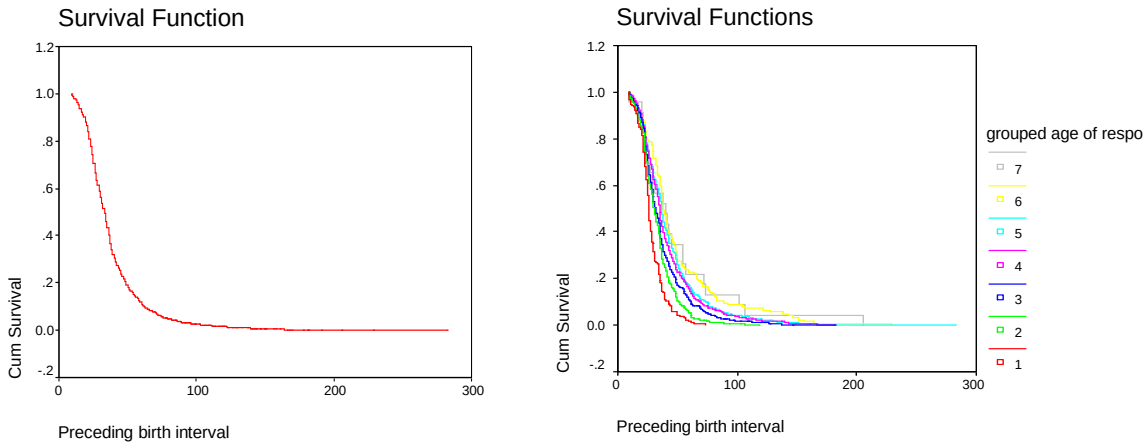


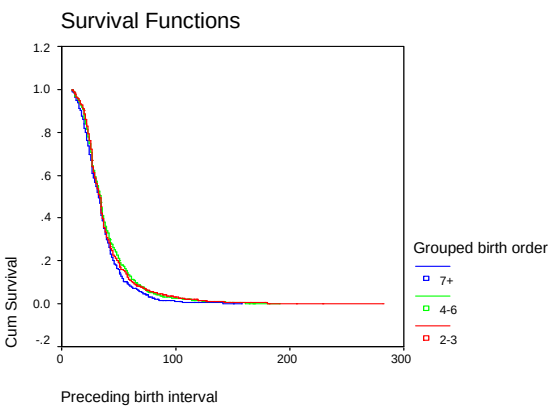


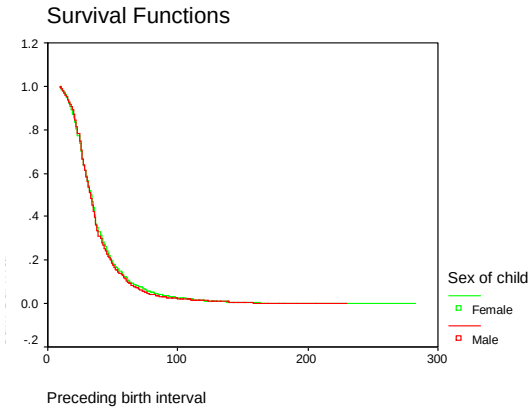


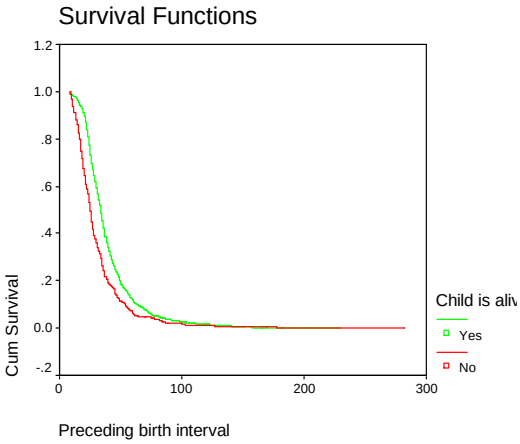


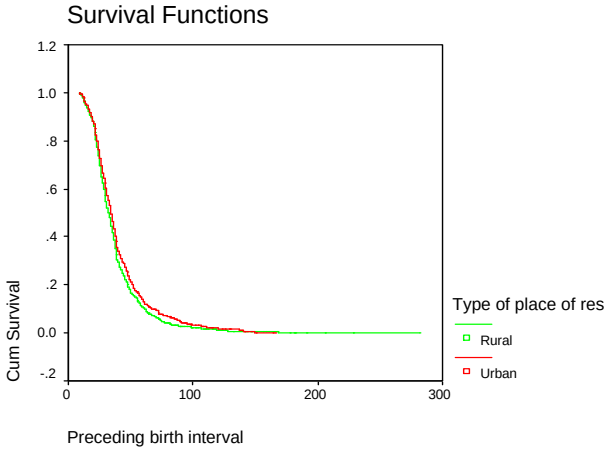
4.2.9a. Plots of survival functions for preceding birth interval of respondents' last birth, NDHS 1990.

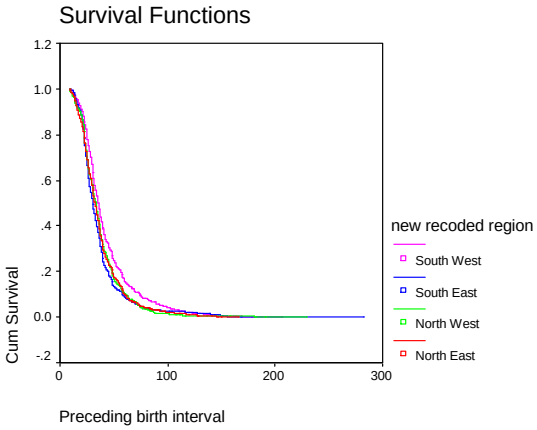


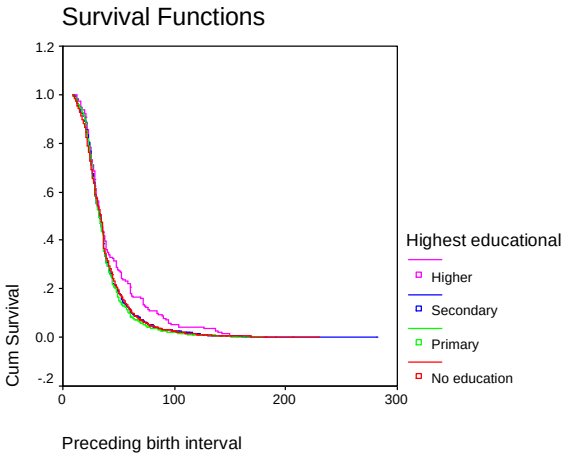

Survival Functions
Cum Survival
1.2
1.0
.8
.6
.4
.2
0.0
-.2
0
100
200
300
Preceding birth interval
Grouped birth order
7+
4-6
2-3


Survival Functions
1.2
1.0
.8
.6
.4
.2
0.0
-.2
0
100
200
300
Preceding birth interval
Sex of child
Female
Male


Survival Functions
Cum Survival
1.2
1.0
.8
.6
.4
.2
0.0
-.2
0
100
200
300
Preceding birth interval
Child is aliv
Yes
No


Survival Functions
Cum Survival
1.2
1.0
.8
.6
.4
.2
0.0
-.2
0
100
200
300
Preceding birth interval
Type of place of res
Rural
Urban


Survival Functions
Cum Survival
1.2
1.0
.8
.6
.4
.2
0.0
-.2
0
100
200
300
Preceding birth interval
new recoded region
South West
South East
North West
North East


Survival Functions
Cum Survival
1.2
1.0
.8
.6
.4
.2
0.0
-.2
0
100
200
300
Preceding birth interval
Highest educational
Higher
Secondary
Primary
No education

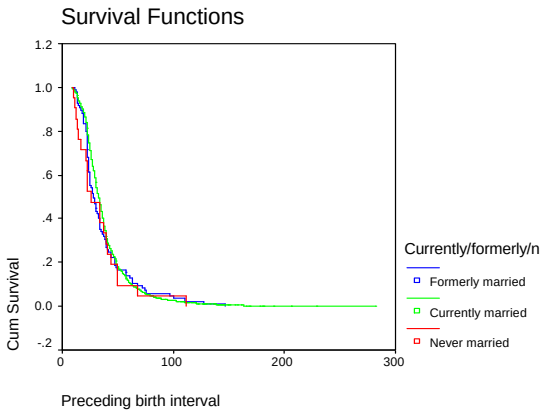
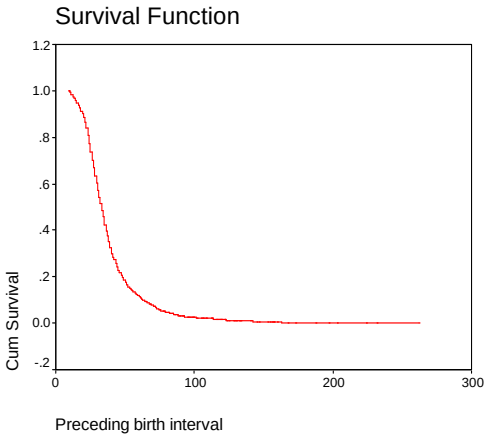
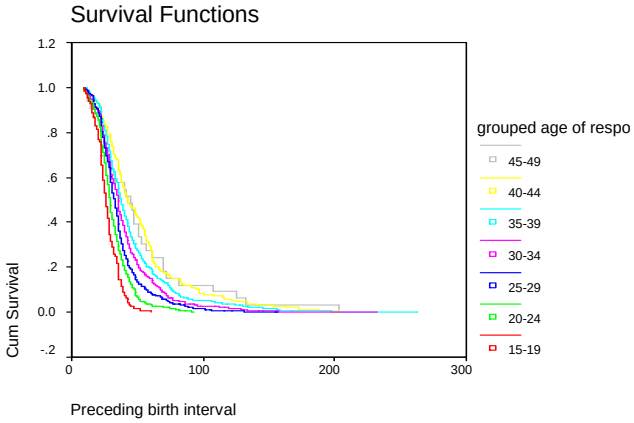
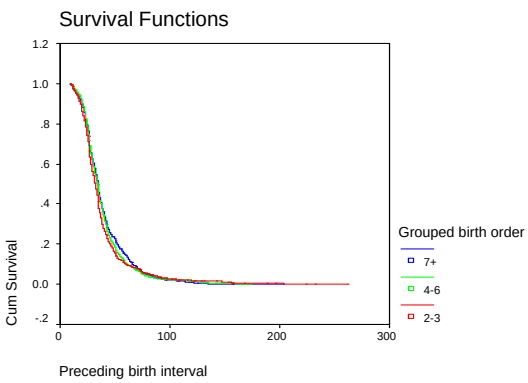
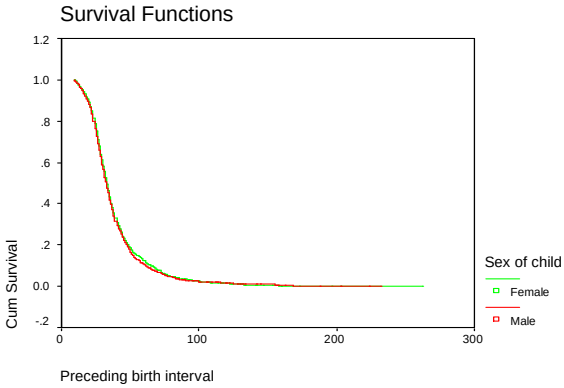


Figure 4.2.9b. Plots of survival functions for preceding birth interval of respondents' last birth, NDHS 1999.









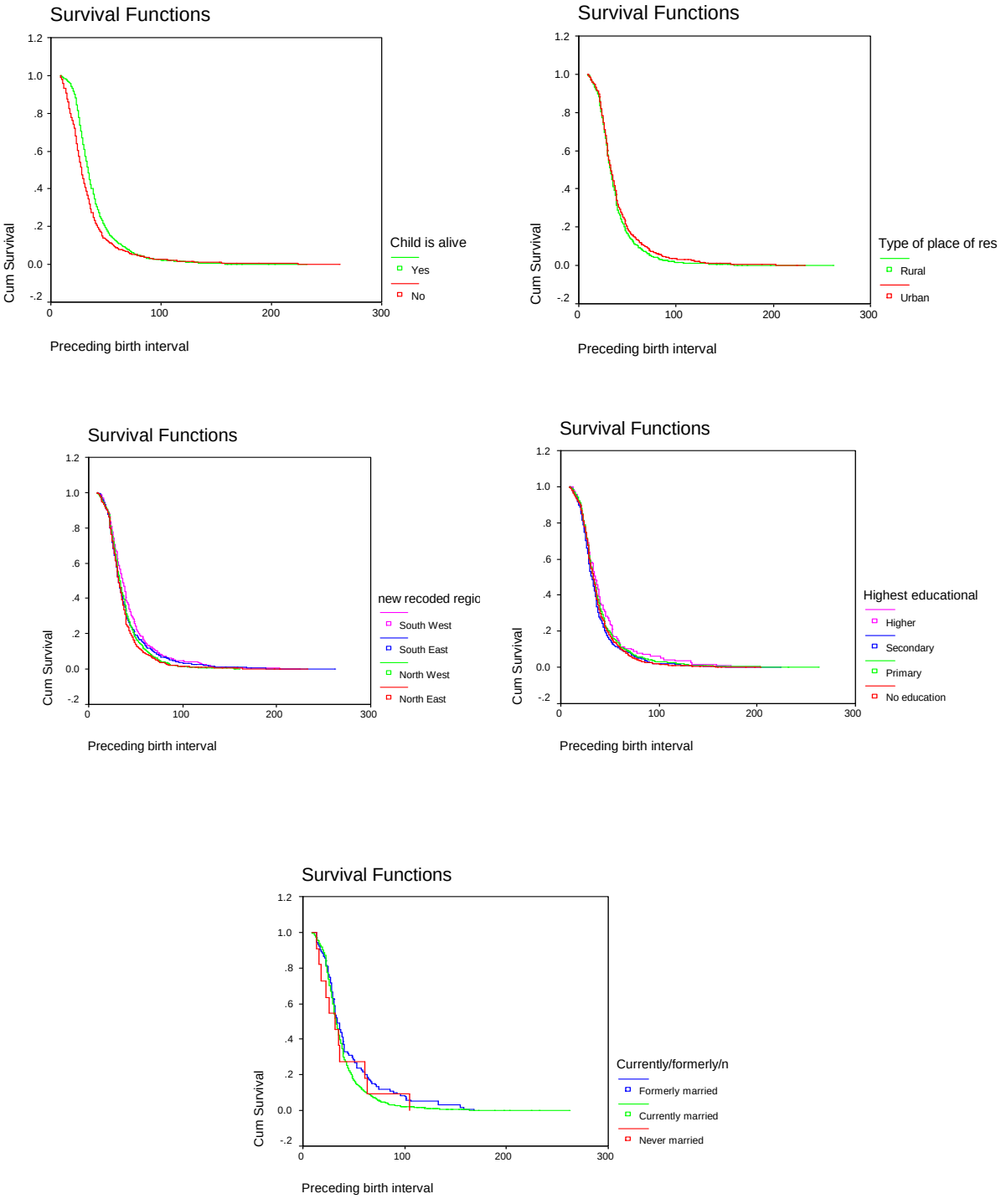


Figure 4.2.9c. Plots pf survival functions for preceding birth interval of respondents' last child, NDHS 2003.

Figures 4.2.9a-c, confirm the median length of preceding birth interval to the last child as in Table 4.2.9. The vertical gap implies that at a specific time point, one group had a greater fraction of respondents who have not experienced the outcome while horizontal gap means that it took longer for one group to experience a certain fraction of the outcome. For example, at the lower length of birth interval in all the survey years, the 45-49 years old respondents had a greater fraction of them that were yet to end the birth interval period to having another child than any other age group. Likewise, respondents whose preceding child are alive had a greater fraction of them yet to end the birth interval period to having another child compared to those whose preceding child are dead. The well-defined horizontal steps with declining magnitude observed among the never married group and to some extent, the formerly married is due to the small number of respondents in these groups.

4.3. DISCUSSION

A comparison of the total sample of women with currently married women and women whose husbands were interviewed shows that while the currently married women were comparable to the women whose husbands were interviewed, the two differ from the total sample of women in terms of basic characteristics. The currently married women and those whose husbands were interviewed were older, less educated and more in the rural area in the three surveys. This could be due to the proportion and characteristics of the single women in the total sample.

Examination of the total sample shows a general decline in the percentage of women as age increases except among the rural and northern respondents in the 1990 sample where the percentages of women actually increased from age group 15-19 up to 25-29 before it followed the expected downward trend. For the total population, three fifths of the women reside in the rural area. There is however variation in this by age group, education and marital status. The older, less educated and currently married women are more in the rural area. The northern respondents are also less likely to be educated but more likely to be currently married. This was also found by Makinwa-Adebusoye and Feyisetan (1994) in their analysis of the quantum and tempo of fertility in Nigeria.

The total fertility rate (TFR) for the country as a whole decreased from 6.32 in 1990 to 5.37 in 1999 and rose to 5.82 in 2003. This purported reversal in trend should be interpreted with caution as the omission of births in the 1999 data was said to have resulted into an underestimate of current fertility of about 16-17 percent (NDHS report, 1999). A more likely estimate of the TFR for the 5-year period preceding the 1999 survey is 6.0 births per woman as found through the indirect methods of estimation used in section 4.2.2 above. However, the data could not be adjusted, as the estimates by the methods were unstable within the sub groupings. This no doubt affected all the fertility measures estimated and the trend of decline between 1990 and 1999 and upswing between 1999 and 2003 ran through all the measures calculated. Emphasis in interpretation is thus more on the trend between 1990 and 2003. The observed age specific fertility rates (ASFR) in all the surveys are consistent with the expected pattern, with the peak at age group 25-29.

The national average masks large variations in the fertility levels between subgroups in the country. For example, the women in the North generally have higher number of children than their Southern counterparts (although, there is some variation within the Northern and Southern regions too). This difference is really marked in the early childbearing years, which resulted into a difference of about two children per woman between North West and South West in 1990 and about three children between North East and South West in 2003.

Fertility levels are also higher among rural women by an average of one birth per woman. These differences are not surprising as they only depict the wide regional variation that exists within Nigeria. Substantial difference also exists in the fertility levels of women with no education and those with secondary and tertiary levels of education. Regional, residential as well as educational variations in fertility levels have also been reported in other parts of the world especially in Sub Sahara African countries (Mboup and Saha, 1998; Moultrie and Timaeus, 2002; APHRC, 2002). Between survey periods, fertility generally declined among the sub groups except for women in the North East, women with no education and women with tertiary level of education.

Indirect estimates of fertility shows that fertility has been declining in the country. Age at first birth is found to be declining in Nigeria and lower among respondents in the rural and the Northern part of the country. Adegbola (1987) also found higher ages at first birth in the South compared to the North. Median age at first birth is found to have the

expected positive association with level of education. The decline in age at first birth is also accompanied by a decline in the age at last birth of respondents that want no more children and this translated into a decline in the number of years spent in child bearing across age groups.

Percentage of never married women having non-marital births was found to be increasing over time but at a level below six percent and with no identifiable educational or regional pattern, which shows that non-marital birth is still uncommon in Nigeria. The increasing trend in the births among the never married women here and the decline in the never married actual fertility (TFR) should however not be mixed up. While the never married birth was examined among the women that had ever given birth, the TFR was based on the total sample of women that had never been married. Teenage motherhood has been on the decline both nationally and regionally and is relatively high among teenagers from the rural area, the North and among those with less than secondary level of education. The differential in teenage pregnancy and motherhood between the North and the South could be as a result of early age at marriage for respondents in the North while the negative association between education and onset of childbearing is well documented (Pasarell S, 1995; Klepinger et al, 1995; Otterblad et al, 2001; Westoff, 2003; National Association of State Boards of Education, 2006).

The proportion of women that progresses from one parity to another decreases as parity increases (especially after parity two). This trend is not so stable at age groups 15-19 and 20-24 due to incomplete childbearing experience. For age group 45-49, the proportion

moving from one parity to the next are almost the same for all parities (not much fertility change over parity line). This is likely to be as a result of the small number of women in the age group. Between 1990 and 2003, the last parity went down to 14 from 15.

As with the other fertility measures examined thus far, differentials also exist in the parity progression ratios among the various sub groups in the country. Progression ratios were higher among rural women, women in the North and women with low level of education. This is explainable by the pattern exhibited by the age specific fertility rates along age groups and the other characteristics of the women considered. Differentials by these characteristics were also noted in Kenya by Ochieng (1996) although the patterns are different from that of this study. The general negative linear trend in the progression ratios suggests that there is no obvious socially imposed optimum number of children (although there is a political four-child policy in existence) among the Nigerian women. The ratios would have shown majority of the women progressing to that parity and a sharp drop in the proportion progressing to higher parities thereafter if any. Infact, 28.6, 29.5 and 30.4 percents of the respondents (who have ever had a child or pregnant as at the time of the survey) had more than four children in the 1990, 1999 and 2003 surveys, respectively.

Apart from age of mother at birth of child, which has a positive association with median length of birth interval and the surviving status of preceding child (which is understandably shorter if the preceding child is dead), length of birth interval by other characteristics shows no significant variation. That no major difference in length of birth

interval by type of place of residence, region, level of education, marital status, birth order and sex of preceding child over the years suggests that there is some form of norm (perhaps cultural) firmly held and subscribed to by Nigerian women in general, which transcends beyond the basic characteristics considered.

The effect of the similar level of birth interval among groups could be the reason why the patterns in the parity progression ratios are so similar. Since no major differential is seen in the length of birth interval, the observed differential in actual fertility among the subgroups in the country could perhaps be explained by the difference in the ages at onset and stoppage of childbearing. It is equally important to note that, the observed decline in the number of years spent in child bearing across age groups (from median age at first birth and that of last birth) and the decline in the proportion that progress from one parity to the next (although the level of birth interval across the various divides is similar) is a testimony to a decline in the level of fertility (in general) in Nigeria.

Due to the important role of the length of birth interval in influencing fertility levels (i.e. number of children eventually had by women), some of its determinants along with other determinants of fertility would be examined in the next chapter.

CHAPTER 5

PROXIMATE DETERMINANTS OF FERTILITY

5.0. INTRODUCTION

This chapter addresses the second objective of this study. Some of the direct (proximate or intermediate) and indirect factors that influence fertility outcome are first examined. These include age at first marriage, age at first sexual intercourse, primary sterility, the percentage of women that are currently married and the median age at their first marriage as well as the percentage that are sexually active. Also examined are the percentages using contraception among married and sexually active women and the mean duration of postpartum variables among married and sexually active women.

Finally, the proximate determinant indices are estimated for married and sexually active women to determine their inhibiting effect on fertility and the two results compared. The examination of the proximate determinants of fertility is important because “it constitutes the institutional control mechanisms through, which a society regulates the reproductive capacity of its members for the achievement of fertility levels consonant with production and social organization. They are also intimately linked to and strongly influenced by socio-economic conditions” (Bongaarts, 1978; Adegbola, 1987). It is therefore expected that socio-economic conditions in Nigeria could affect the proximate determinants.

5.1. THE FIRST TIMERS: MARRIAGE AND SEXUAL ACTIVITY

5.1.1. AGE AT FIRST MARRIAGE

Marriage is universal in Nigeria and commencement of childbearing is socially acceptable only within the institution. Age at first marriage therefore, influences the period of time in which a woman is exposed to the risk of pregnancy during her reproductive years. Table 5.1.1 shows that the median age at first marriage across age groups has been about 16 and 17 years over time in Nigeria. The age at first marriage is consistently higher in urban area compared to the rural. While it remains stable at 18 years among respondents from the urban area, it rose from 15 years in 1990 to 16 years in 1999 and 2003 among the rural residents. Age at first marriage increases with the level of education and this is the case in the three survey years and across age groups.

However, age at first marriage remains 15 years in the total sample of women aged 20 to 49 years for respondents with no formal education over time while it declines for the other three educational categories between 1990 and 1999. The 2003 median values by the categories of education are the same as what was observed in 1999. No definable pattern is found in the age at first marriage across the age groups at the regional levels. It however increased by one year in the South East and South West between 1990 and 2003 while it remained the same in The North East and North West over the three survey years. Median age at first marriage is higher in the South compared to the North in all cases.

Table 5.1.1. Median Age at First Marriage Among Women Aged 15-49 by Current Age and Selected Background Characteristics, NDHS 1990, 1999 and 2003.

Background characteristics	*Current age of Women*							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	20-49
1990								
Residence								
Urban	15	18	19	18	19	19	19	18
Rural	14	15	15	15	16	15	17	15
Education								
None	14	14	15	15	15	15	16	15
Primary	15	17	18	17	18	19	19	18
Secondary	16	19	21	20	20	20	21	20
Tertiary	-	18	23	23	21	18	24	23
Region								
North East	14	14	14	15	15	15	15	15
North West	14	15	15	15	15	14	15	15
South East	15	17	18	17	17	17	17	17
South West	16	19	20	19	19	20	19	19
Total	14	16	16	16	17	16	17	16
1999								
Residence								
Urban	15	18	19	18	18	17	18	18
Rural	14	15	16	16	16	16	17	16
Education								
None	14	14	15	15	15	15	17	15
Primary	15	17	18	17	18	17	18	17
Secondary	17	19	20	20	20	20	20	19
Tertiary	-	20	23	22	23	22	22	22
Region								
North East	15	15	15	15	15	14	15	15
North West	14	15	15	15	15	15	16	15
South East	16	18	19	18	19	18	18	18
South West	16	19	20	20	20	19	19	19
Total	14	16	17	17	17	16	17	17
2003								

Residence								
Urban	15	17	19	18	17	17	16	18
Rural	14	16	16	15	15	15	15	16
Education								
None	14	15	15	14	14	14	15	15
Primary	15	17	17	17	17	17	17	17
Secondary	16	18	20	20	20	20	20	19
Tertiary	19	21	23	24	22	21	20	22
Region								
North East	15	16	16	14	15	14	14	15
North West	14	15	15	15	15	14	15	15
South East	16	18	19	19	17	18	16	18
South West	16	19	20	20	20	19	19	20
Total	15	16	17	16	16	16	16	16

5.1.2. AGE AT FIRST SEXUAL INTERCOURSE

In most African settings, age at first marriage signifies the onset of the risk of pregnancy to a woman. For some women however, initiation of sexual activity precedes marriage and therefore correctly defines exposure to the risk of pregnancy than age at first marriage (APHRC, 2002). From Table 5.1.2 below, age at first intercourse in the total sample of women aged 20-49 remained at about 16 years over the survey years. The pattern of age at first sexual intercourse is mixed across the age groups. It is 16 years across age groups in 1990 except in age group 30-35 where it is 15 years. It appears higher however in 1999 compared to 1990 where it is either 16 or 17 years across the age groups. A monotonic increase from the higher age groups to the lower ones is observed in 2003, which suggests an increase in the age at first intercourse. Age at first intercourse is 15 years for women aged 45-49 in 2003. This increased to 16 years in the age group 30-34 and then to 17 years in age groups 20-24 and 25-29 (further detail in Table 5.1.2).

Table 5.1.2 also shows that women in the rural areas initiate sexual intercourse two years earlier than those from the urban areas in the total sample of 20-49 year-olds in the three survey years. The range by which rural women initiate sexual intercourse compared to the urban women across age groups is however one to three years across the age groups. Age at first sexual intercourse increases as the level of education increases in all cases. While the age at first sexual intercourse remain 15 and 18 years for respondents with no education and those with secondary level of education respectively over the survey years, it declined from 17 to 16 years for those with primary and 20 to 19 years for those with tertiary levels of education between 1999 and 2003. Age at first intercourse remains relatively stable across age groups within the regions. An increase of one year in the North East between 1990 and 1999 is of note. Age at first intercourse is generally lower in the North compared to the South. This is consistent with the lower age at first marriage observed among respondents from the North.

Table 5.1.2. Median Age at First Sexual Intercourse Among Women Aged 15-49 by Current Age and Selected Background Characteristics, NDHS 1990, 1999 and 2003.

Background characteristics	*Current age of Women*							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	20-49
1990								
Residence								
Urban	15	17	18	17	18	18	18	17
Rural	14	15	15	15	15	15	16	15
Education								
None	14	14	14	15	15	15	16	15
Primary	15	16	17	17	18	18	18	17
Secondary	16	18	18	18	18	18	19	18
Tertiary	17	19	20	20	19	18	20	20
Region								
North East	14	14	14	14	15	15	15	14
North West	14	14	15	15	15	14	15	15
South East	15	17	17	16	17	16	17	17
South West	16	18	18	18	18	19	18	18
Total	15	16	16	15	16	16	16	16
1999								
Residence								
Urban	16	17	18	18	18	17	18	18
Rural	15	16	16	15	15	15	17	16
Education								
None	14	14	15	15	15	15	16	15
Primary	15	16	17	17	18	17	17	17
Secondary	16	18	18	18	19	19	20	18
Tertiary	15	19	20	19	19	20	22	20
Region								
North East	15	15	15	15	15	14	15	15
North West	14	15	15	15	15	15	16	15
South East	15	17	18	18	18	18	18	18
South West	16	18	18	18	18	18	18	18
Total	15	16	17	16	16	16	17	16
2003								

Residence								
Urban	15	18	18	17	16	17	16	17
Rural	15	16	16	15	15	15	15	15
Education								
None	14	15	15	14	14	14	15	15
Primary	15	16	16	16	16	16	16	16
Secondary	16	18	18	18	18	19	19	18
Tertiary	17	19	20	19	20	20	19	19
Region								
North East	15	16	15	15	14	14	14	15
North West	14	16	15	15	15	14	15	15
South East	16	17	18	18	17	17	16	17
South West	15	18	18	18	18	18	18	18
Total	15	17	17	16	15	15	15	16

5.2. PRIMARY STERILITY

Primary sterility is the inability to conceive at all and have offspring (i.e. pregnancy has never occurred) (Larsen and Menken, 1989; answers.com, 2007). This is one of the factors that influence fertility directly as its prevalence affects eventual fertility level in any society. For instance, where it is high, fertility of such area is bound to be low. The World Health Organization (WHO) has pointed out the high prevalence of infertility in parts of Sub-Saharan Africa and the heavy burden it on the limited health-care facilities and resources (Larsen, 1994). It is therefore important to know its level and trend as its incidence affects actual fertility outcome.

From Table 5.2, estimated percentage of primary sterility is 4.7, 3.0 and 3.4 percents in 1990, 1999 and 2003 respectively. The percentage is consistently higher in the rural compared to the urban and in the North compared to the South. Among married respondents, primary sterility declined over time while it increased over time for those that are formerly married. There is no definable pattern in the trend among the education

categories. The percentage is however lower than the 3% estimates derived by Frank (1983) for developing countries in the primary category as well as for respondents from the South. The 1990 estimate is comparable to Larsen (1994) estimate of 0.04 proportions of women that are childless in Nigeria using the 1990 NDHS.

Table 5.2. Percentage of Women Aged 45-49 Years Who Had Never Given Birth

	1990	1999	2003
Residence			
Urban	3.9	1.8	2.5
Rural	5.0	3.5	3.9
Education			
None	5.5	3.3	4.0
Primary	1.2	2.9	1.6
Secondary	-	-	3.4
Tertiary	-	3.6	2.8
Region			
North East	10.2	3.0	4.5
North West	6.0	6.0	4.6
South East	1.2	1.6	2.2
South West	1.7	2.5	1.8
Marital status			
Never married	-	16.7*	66.7*
Currently married	4.9	2.7	2.6
Formerly married	2.8	3.8	6.3
Total	4.7	3.0	3.4

* Observed percentage influenced by small number of women. There are six and three women in total in the never married category in 1999 and 2003 respectively.

5.3. ESTIMATION OF THE PROXIMATE DETERMINANTS OF FERTILITY USING CURRENTLY MARRIED WOMEN.

Davis and Blake (1956) were the first to elaborate a framework of the factors that affect fertility directly and indirectly. The proximate determinants of fertility framework, which is from the socio-economic perspective of fertility holds that all demographic, socio-economic, cultural, institutional, psychological, health and environmental factors (background variables) operate through the intermediate variables to affect fertility. These 'proximate or intermediate determinants' comprise factors such as the extent of exposure to intercourse (marriage patterns), fecundability (including frequency of intercourse), duration of postpartum infecundability, spontaneous intrauterine mortality, sterility and use of deliberate fertility control (contraception and induced abortion). Examining these factors that affect women's risk of becoming pregnant and or having a live birth is therefore important for the understanding of fertility (Bongaarts, 1978).

5.3.1. BASIC DETERMINANTS OF FERTILITY OF CURRENTLY MARRIED WOMEN.

As a prelude to estimating the proximate determinants of fertility, some basic determinants of fertility of currently married women in the Nigerian Demographic and Health Survey (NDHS) data sets of 1990, 1999 and 2003 are examined and these are presented in Table 5.3.1 below. These are: the Median age at first marriage; the percentage that are currently married and contracepting as well as the average duration of breastfeeding, amenorrhea, abstinence and postpartum insusceptibility (of or after last child).

Levels and pattern of median age at first marriage in the total sample of currently married women is similar to what is found in the total sample of all women. In the sample of currently married women, median age at first marriage is 16 years in the three sets of data. Variation however exists between the various sub groups. For example, median age at first marriage is higher in the urban area compared to the rural area. This is 18 years in 1990 and 1999 and 17 in 2003 for the urban residents while it is 15 in the 1990 and 2003 and 16 in 1999 surveys for the rural residents.

Median age at first marriage increases with the level of education of the respondents for all the surveys (see Figure 5.3.1). Little or no variation however exists within the various educational categories over the years. For example, median age at first marriage in 1990 increased from 15 among respondents that had no formal education to 17 among respondents with primary level of education to 19 for those with secondary level of education and to 23 among respondents with tertiary level of education. For respondents with no formal education, median age at first marriage declined from 15 years in 1990 and 1999 to 14.5 years in 2003 while it fell from 23 years in 1990 to 22 years in 1999 and 2003 for respondents with tertiary (higher) level of education.

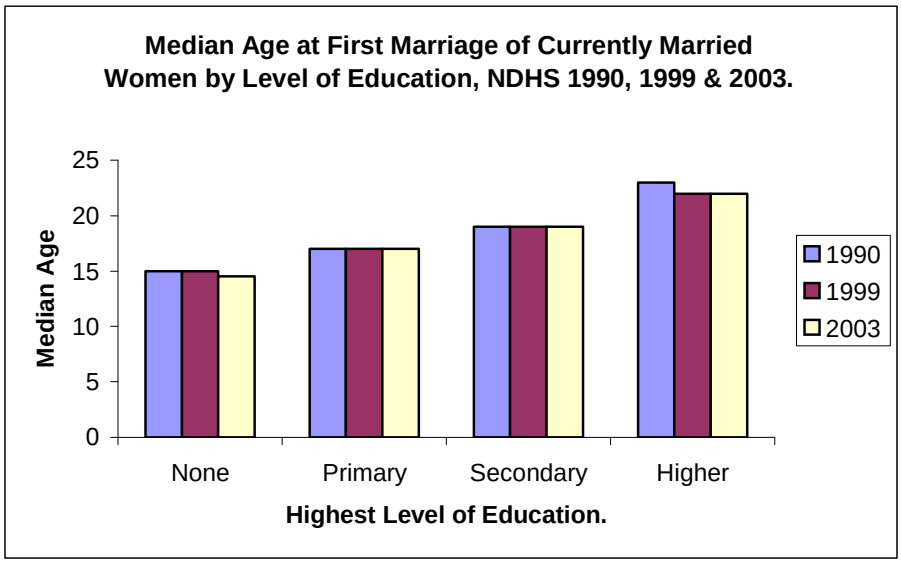


Figure 5.3.1. Median Age at First marriage of Currently Married Women by Level of Education, NDHS 1990, 1999 and 2003.

Regional (geographical) variation in the age at first marriage also exists. This is basically 15 years for respondents from the North East and North West for all the years (except in the North East in 1990 where it is 14 years). In the South East, median age at first marriage rose from 17 years in 1990 to 18 years in 1999 and 2003. This is 19 years in 1990 and 1999 and 20 years in 2003 for respondents from the South West.

Table 5.3.1. Currently Married Women (with Percentage of it Recently Sexually Active in parentheses) by Some Basic Fertility Determinants and Mean Duration (Months) of Postpartum Variables.

		PERCENTAGE			AVERAGE DURATION OF			
RESIDENCE	MAFM	M	C	PS	BF	AM	ABST	PPI
Urban								
1990	18.0	67.1 (88.2)	17.30	4.00	16	14	16	20
1999	18.0	65.6 (80.1)	21.00	1.40	19	13	10	15
2003	17.0	61.2 (85.5)	18.30	2.00	19	12	8	15
Rural								
1990	15.0	82.4 (92.3)	4.20	5.30	23	21	17	27
1999	16.0	72.4 (83.6)	12.80	3.30	21	15	11	18
2003	15.0	72.0 (88.7)	9.80	3.00	20	15	9	18

EDUCATION								
None								
1990	15.0	92.5 (91.7)	2.80	5.90	22	23	18	29
1999	15.0	91.4 (83.1)	5.90	2.90	23	17	10	19
2003	14.5	89.6 (88.2)	4.40	3.00	21	17	8	20
Primary								
1990	17.0	72.8 (72.8)	10.60	0.00	18	14	16	21
1999	17.0	69.7 (79.1)	16.90	3.50	19	13	13	17
2003	17.0	70.7 (86.2)	13.60	1.80	19	13	11	16
Secondary								
1990	19.0	43.8 (90.3)	20.40	0.00	14	9	10	13
1999	19.0	44.7 (85.3)	21.10	0.00	18	11	10	14
2003	19.0	41.8 (88.1)	19.70	0.00	17	10	8	13
Tertiary								
1990	23.0	56.9 (79.0)	41.70	0.00	10	8	7	10
1999	22.0	59.5 (80.6)	44.70	0.00	15	8	6	9
2003	22.0	52.8 (83.7)	33.10	3.60	14	7	6	10
REGION								
North East								
1990	14.0	92.1 (95.5)	1.90	10.80	24	27	18	31
1999	15.0	83.8 (88.2)	3.90	1.10	22	15	9	17
2003	15.0	79.2 (90.5)	5.70	2.20	21	16	7	18
North West								
1990	15.0	91.9 (94.6)	2.40	6.30	22	23	14	27
1999	15.0	80.8 (84.3)	10.90	6.50	22	17	11	19
2003	15.0	82.2 (92.1)	8.00	5.00	21	14	7	17
South East				0.00				
1990	17.0	64.8 (87.1)	9.70	0.90	19	14	17	21
1999	18.0	52.2 (80.1)	22.60	1.40	17	11	11	14
2003	18.0	50.3 (81.8)	18.10	1.40	17	10	6	16
South West								
1990	19.0	64.4 (85.7)	19.20	1.40	16	12	18	21
1999	19.0	65.8 (75.3)	23.60	2.10	19	11	13	15
2003	20.0	55.8 (79.4)	25.00	2.20	17	11	11	15
TOTAL								
1990	16.0	76.3 (90.8)	9.40	4.90	20	19	17	25
1999	16.0	70.2 (82.5)	15.50	2.70	20	14	11	17
2003	16.0	67.7 (87.5)	13.20	2.60	20	14	9	17

MAFM- Median Age at First Marriage
M - Married
BF - Breastfeeding
C - Contracepting
AM - Amenorrhea
C, BF, AM, ABST & PPI based on Proportion married.

ABST - Abstinence after last birth
PPI - Postpartum insusceptibility
PS - Primary sterility (based on ages 45-49)

In the total sample of women interviewed in the three surveys, the percentage of currently married women declined from about 76% in 1990 to 70% in 1999 and to 68% in 2003. This is generally the case within the various groupings over the years. Differentials however exist between the groups. Percentage of currently married women is consistently higher in the rural compared to the urban. For example, 66% of respondents were currently married in the urban in 1999 compared to 72% in the rural.

A negative association exists between the percentage of currently married women and level of education up to the secondary level of education. Surprisingly, the percentage of currently married women with higher level of education is higher compared to those with secondary level of education for all the years. For example, while 43.8% of women with secondary level of education are currently married in 1990, the percentage is 56.9 for women with tertiary level of education in the same year. Percentage of currently married women is much higher in the North compared to the South in all cases. The percentages are basically the same in the North East and North West while they are on the average higher in the South West compared to the South East. The percentage of currently married women who are sexually active according to the definition used in this study is in parentheses (column 3 of table 5.3.1) for the various sub groups.

Percentage of women contracepting in the total sample of married women increased from 9.4 in 1990 to 15.5 in 1999 after which it declined to 13.2 in 2003. This is the pattern observed over the years for all the groupings except in the North East where it increased consistently (1.9% in 1990, 3.9% in 1999 and 5.7% in 2003) and in the South West (19.2; 23.6 and 25 percents in 1990, 1999 and 2003 respectively) over the years. The percentage

of currently married women contracepting is lowest in the North East and highest in the South West for all the surveys. Percentage of women contracepting is higher in the urban area compared to the rural for all the surveys while the percentage contracepting is positively related to level of education. For example, percentages of women contracepting in 2003 are 4.4; 13.6; 19.7 and 33.1 for respondents with no, primary, secondary and tertiary levels of education, respectively.

Percentage of women with primary sterility decreases consistently in the total sample of married women over the years (4.9, 2.7 and 2.6 percents in 1990, 1999 and 2003 respectively). It is generally higher in the rural area compared to the urban and in the North compared to the South (below the 3% estimate for developing countries) although, it can be said to increase over time in the South. The pattern between and within the education category is not well defined and there is no observation in the secondary category of education for the three years while the tertiary education level has cases only in 2003.

To give a summary measure of duration of breastfeeding, amenorrhea, abstinence and postpartum insusceptibility, mean duration is derived. This is because all the proximate determinants are expressed as means or proportions. Although some application of the proximate determinants of fertility model have used the median duration for postpartum insusceptibility on the belief that the overlap between postpartum amenorrhea and contraceptive use may be greater for those who have the longest periods of amenorrhea, no evidence was found in a review of DHS data by Stover (1998) to support this.

In the estimation of average duration of breastfeeding, amenorrhea, abstinence and postpartum insusceptibility (of/after last child), the month variables were used as the time variable while duration variables were recoded into the status variable. Women that are still breastfeeding, or abstaining or with period not returned were censored. Kaplan Meier survival technique was then used to estimate the average durations. In the estimation of mean duration of postpartum insusceptibility, whichever has the longer duration between abstinence and amenorrhea for individual women was used.

Mean duration of breastfeeding in the total sample of currently married women is 20 months over the years. Differentials are however noted in its pattern between and within the various sub groups. As might be expected, mean duration of breastfeeding is higher for rural residents compared to their urban ones. Surprisingly, it is increasing for the urban residents while decreasing for the rural residents over time (see Table 5.3.1 for further details). This could be as a result of the baby friendly initiative (BFI) introduced in the country and vigorously pursued since 1991. Baby friendly initiative is a United Nations Children's Fund (UNICEF) programme, which outlines ten steps to successful breastfeeding (BirthChoiceUK, 2006). The programme particularly advocates exclusive feeding of infants for the first six months of life. Since there are more health facilities in the urban compared to the rural, the effect of the programme is more likely to be greater in the urban (at least earlier) than in the rural.

Mean duration of breastfeeding is negatively associated with level of education as the duration for respondents with no, primary, secondary and tertiary levels of education in 1999 are 23, 19, 18 and 15 months respectively. This is the case for the other two years. For region, respondents from the North have higher mean duration of breastfeeding compared to those from the South. For example, mean duration of breastfeeding are: 24, 22, 19 and 16 months in 1990 for respondents from North East, North West, South East and South West respectively.

There is a decline in mean duration of amenorrhea from 19 months in 1990 to 14 months in 1999 and 2003 in the total sample of currently married women. This decline is observed in all the groupings. Mean duration of amenorrhea is higher in the rural area compared to the urban; decreases with increase in the level of education and higher for respondents from the North compared to those from the South. Similar patterns to this (mean duration of amenorrhea) are exhibited in the mean duration of abstinence and postpartum insusceptibility (see Table 5.3.1 for details).

5.3.2. PROXIMATE DETERMINANTS OF FERTILITY AMONG CURRENTLY MARRIED WOMEN.

Bongaarts (1978) developed the ideas of Davis and Blake (1956) on the factors affecting fertility directly and indirectly into a framework for analysing the proximate determinants of fertility. The framework explains the fertility inhibiting effects of the key determinants and has been improved upon a number of times by Bongaarts himself, with others and by others.

This section is done using the Bongaarts et al (1984) model. As shown in Table 5.3.2a, the first proximate determinant index estimated is the inhibiting effect of marriage patterns on fertility. This declined from 0.81 in 1990 to 0.76 in 1999 and 2003. The index is higher for rural residents compared to those in urban and consistently decline for those in the urban over the years. A negative correlation is exhibited between the index and level of education. It is however of no definable pattern within the educational levels. The index of marriage generally declined over time in all the regions. It is noted that the index is higher for the Northern residents compared to the Southern ones.

For the contraception index, it decreased from 0.93 in 1990 to 0.88 in 1999 and then increased to 0.89 in 2003 in the total sample of women. This pattern is generally seen within the various groups. The index is higher in the rural areas compared to the urban in all the surveys while it decreases with increase in the level of education. Exception to the general pattern is found in the North East and South West where the indices consistently declined over the years.

In the total sample of currently married women, the index of insusceptibility increased from 0.46 in 1990 to 0.56 in 1999 and 2003. The index equally increased over time in both rural and urban areas but higher in urban compared to rural (implying that it has a lower inhibiting effect on fertility in the urban compared to the rural areas). The higher insusceptibility index observed in the urban could be explained by the shorter amenorrhic period as a result of shorter breastfeeding period among the urban respondents since insusceptibility calculation was based on whichever is longer of the period of abstinence or amenorrhea. The trend of the index is ill defined within the educational levels but is

positively associated with education. For region, the indices increased over the years in the North and South West while it increased between 1990 and 1999 in the North and South East and thereafter decline by 2003.

The index of sterility takes into account only primary sterility. The calculation of the index is based on a 3% standard rate of childlessness in developing countries (Frank, 1983; Bongaarts et al, 1984). The index of sterility presents a mixed picture. It is greater than one where the percentage of women aged 45-49 with no child is less than 3%; equals to one where the percentage is 3% and less than one where the percentage is greater than 3%. In the total sample of married women, the index increased over time. From 0.97 in 1990 to 1.00 in 1999 and 1.01 in 2003. The index is greater than one in the regions except in the North West. This is also the case in the education categories except in the no education category where it is lesser than one in 1990 and exactly one in 1999 and 2003. The pattern within rural category is same as in the no education category while the index is lesser than one in 1990 for urban and higher than one in the other two years. The lowest value of the index (0.88) is found in the North East in 1990.

Total fertility rate (TFR) for the country as a whole dropped from 6.32 (children per woman) in 1990 to 5.37 in 1999 and up again to 5.82 in 2003. This downward and then upward pattern in the country's TFR between 1990 and 2003 is also observed for the sub groups in the country except the consistent downward trend observed for women from the South East and South West. For instance, the TFR for women from the South East declined from 6.05 in 1990 to 4.61 in 1999 and 4.56 in 2003. Number of births per

woman is consistently higher in rural areas than in the urban. TFR is negatively related to education and higher in the North compared to the South. A more detailed result of this is contained in section 4.2.1.1 of Chapter 4.

The total fecundity indicates the level fertility would be if all women were in union throughout the period of their reproductive years, practice no contraception, do not breastfeed or experience postpartum amenorrhea nor observe postpartum abstinence (i.e. if all the proximate determinants equal to 1). The estimated total fecundity (TF) follows the pattern of the TFR. It declined from 18.78 in 1990 to 14.27 in 1999 and then rose to 15.27 in 2003. The same pattern is exhibited within the various sub groups except for respondents with secondary level of education and those from the North West whose TF declined all though the years. The TF is higher in the rural than in the urban for all the years. The gap between the two areas is however closing rapidly. TF is negatively associated with level of education and a notable difference among the regions is found only in 1990 where the values of TF are 17.56; 18.92; 16.23 and 16.48 in the North East, North West, South East and South West respectively.

Table 5.3.2a. Proximate Determinants of Fertility indices of Currently Married Women, NDHS 1990, 1999 and 2003.

						Observed	Calculated
		Cm	Cc	Ci	Cp	TFR	TF
RESIDENCE							
Urban	1990	0.75	0.86	0.52	0.98	5.43	16.44
	1999	0.72	0.81	0.60	1.02	4.57	12.75
	2003	0.71	0.84	0.60	1.02	5.10	14.04
Rural	1990	0.86	0.97	0.44	0.97	6.95	19.61
	1999	0.78	0.90	0.55	1.00	5.75	14.96
	2003	0.80	0.92	0.55	1.00	6.31	15.59

EDUCATION							
None	1990	0.95	0.98	0.42	0.96	7.46	19.95
	1999	0.94	0.95	0.53	1.00	6.94	14.64
	2003	0.95	0.96	0.52	1.00	7.65	16.13
Primary	1990	0.85	0.90	0.51	1.05	6.82	16.72
	1999	0.79	0.84	0.56	0.99	5.70	15.45
	2003	0.82	0.87	0.58	1.02	6.37	15.12
Secondary	1990	0.68	0.80	0.63	1.05	4.65	12.98
	1999	0.72	0.78	0.62	1.05	4.71	12.94
	2003	0.67	0.78	0.63	1.05	4.43	12.87
Tertiary	1990	0.65	0.67	0.70	1.05	2.55	8.00
	1999	0.63	0.63	0.73	1.05	2.39	7.89
	2003	0.65	0.73	0.70	0.99	2.79	8.48
REGION							
North East	1990	0.95	0.98	0.40	0.88	6.83	20.78
	1999	0.87	0.97	0.56	1.03	6.71	13.80
	2003	0.86	0.97	0.55	1.01	7.29	15.70
North West	1990	0.92	0.98	0.44	0.95	7.84	20.80
	1999	0.83	0.92	0.53	0.95	5.82	15.18
	2003	0.88	0.94	0.56	0.97	6.63	14.76
South East	1990	0.76	0.92	0.51	1.03	6.05	16.45
	1999	0.68	0.80	0.62	1.02	4.61	13.35
	2003	0.66	0.83	0.58	1.02	4.56	14.01
South West	1990	0.74	0.84	0.51	1.02	5.46	16.82
	1999	0.68	0.78	0.60	1.01	4.50	13.95
	2003	0.65	0.75	0.60	1.01	4.31	14.56
TOTAL							
	1990	0.81	0.93	0.46	0.97	6.32	18.78
	1999	0.76	0.88	0.56	1.00	5.37	14.27
	2003	0.76	0.89	0.56	1.01	5.82	15.27

Table 5.3.2a also shows that the index of postpartum insusceptibility has the most inhibiting effect on fertility. This is followed by the marriage, contraception and sterility indices. The exceptions to this general order is found at the tertiary level of education where the index of marriage has the most fertility inhibiting effect followed by index of

contraception in 1990 and 1999 and then the index of insusceptibility. In 2003 however, the index of sterility is more influential than that of insusceptibility. The index of sterility also has the second most inhibiting effect in the North East in 1990 and the third among respondents with no formal education in 1990.

Jointly, the indices reduced 12.46 births in the total sample of married women in 1990 (9.85 by the index of insusceptibility, 1.48 births by the index of marriage, 0.59 births by the index of contraception and 0.54 births by the index of sterility); 8.90 births in 1999 (6.31, 1.70, 0.96 and -0.06 births by the indices of insusceptibility, marriage, contraception and sterility respectively) and 9.45 births in 2003 (6.6 by the index of insusceptibility, 1.84 by the index of marriage, 0.95 by the index of contraception and 0.09 by the index of sterility). Table 5.3.2b shows the absolute as well as percentage reductions in fertility due to each of the determinants in the total sample as well as in the various sub groups. The negatives in the sterility column (Cp) imply that the index actually increased actual fertility (i.e. it has negative contribution to the reduction from total fecundity to observed level of fertility). The reason for this is that the assumption of 3% standard rate of childlessness in developing countries (imputed into the formula) does not hold in such cases.

Table 5.3.2b. Absolute and Percentage reduction from total fecundity to observed total fertility due to the determinants and the absolute reduction from total fecundity to total fertility rate (the latter in the sixth column: TF - TFR).

	Absolute reduction					Percentage reduction			
RESIDENCE	**Cm**	**Cc**	**Ci**	**Cp**	**TF - TFR**	**Cm**	**Cc**	**Ci**	**Cp**
Urban									
1990	1.81	1.18	7.77	0.25	11.01	16.44	10.71	70.60	2.25
1999	1.78	1.49	5.22	-0.31	8.18	21.72	18.20	63.84	-3.76
2003	2.08	1.37	5.70	-0.21	8.94	23.30	15.30	63.76	-2.37
Rural									
1990	1.13	0.25	10.60	0.68	12.66	8.93	1.97	83.73	5.37
1999	1.62	0.82	6.70	0.07	9.21	17.61	8.89	72.76	0.73
2003	1.58	0.69	7.01	0.00	9.28	17.00	7.39	75.60	0.00
EDUCATION									
None									
1990	0.39	0.16	11.07	0.87	12.49	3.14	1.28	88.59	6.98
1999	0.44	0.39	6.89	-0.02	7.70	5.75	5.05	89.49	-0.29
2003	0.40	0.34	7.74	0.00	8.48	4.75	3.96	91.30	0.00
Primary									
1990	1.20	0.89	8.57	-0.76	9.90	12.15	9.00	86.48	-7.63
1999	1.52	1.37	6.75	0.12	9.75	15.53	14.09	69.19	1.19
2003	1.40	1.16	6.47	-0.27	8.75	15.98	13.26	73.88	-3.12
Secondary									
1990	2.19	1.71	5.02	-0.59	8.33	26.27	20.52	60.26	-7.04
1999	1.83	1.85	5.14	-0.59	8.23	22.25	22.41	62.44	-7.11
2003	2.18	1.86	4.98	-0.58	8.44	25.84	22.09	58.96	-6.89
Higher									
1990	1.37	1.93	2.51	-0.36	5.45	25.18	35.43	46.02	-6.63
1999	1.40	2.23	2.23	-0.36	5.50	25.51	40.49	40.48	-6.48
2003	1.50	1.59	2.52	0.08	5.69	26.42	27.92	44.31	1.35
REGION									
North East									
1990	0.36	0.15	11.00	2.44	13.95	2.58	1.05	78.87	17.51
1999	1.00	0.24	6.25	-0.40	7.09	14.13	3.36	88.07	-5.57
2003	1.19	0.26	7.15	-0.19	8.41	14.11	3.12	85.02	-2.25
North West									
1990	0.68	0.17	11.07	1.03	12.96	5.26	1.34	85.41	7.98
1999	1.19	0.61	6.76	0.80	9.36	12.73	6.51	72.20	8.55
2003	0.90	0.48	6.30	0.44	8.13	11.12	5.92	77.49	5.47
South East									
1990	1.91	0.69	8.31	-0.52	10.40	18.38	6.66	79.97	-5.01
1999	2.17	1.69	5.19	-0.32	8.74	24.83	19.40	59.45	-3.68
2003	2.35	1.42	6.03	-0.34	9.45	24.85	14.97	63.76	-3.57
South West									
1990	1.92	1.41	8.44	-0.41	11.36	16.89	12.37	74.31	-3.57
1999	2.12	1.87	5.66	-0.19	9.45	22.41	19.75	59.85	-2.00
2003	2.32	2.21	5.89	-0.18	10.25	22.64	21.56	57.51	-1.71

TOTAL									
1990	1.48	0.59	9.85	0.54	12.46	11.90	4.71	79.07	4.32
1999	1.70	0.96	6.31	-0.06	8.90	19.05	10.82	70.86	-0.72
2003	1.84	0.95	6.76	-0.09	9.45	19.44	10.01	71.52	-0.97

5.4. ESTIMATION OF THE PROXIMATE DETERMINANTS USING RECENT SEXUALLY ACTIVE WOMEN.

It is often argued that sexual activity correctly defines exposure to the risk of pregnancy than marriage (APHRC, 2002). In African societies in particular, customs governing abstinence from sexual relations for extended periods can reduce pregnancy risks. Coital behaviour is thus an important factor in the study of fertility. In the DHS, all respondents were asked 'When was the last time you had sexual intercourse?' and response to this question is used here as a measure of recent sexual exposure. Sexually active women is defined in this study as women who are sexually active in the last month plus women who are not now sexually active but who are currently pregnant or abstaining postpartum. This definition is in line with that used in the Stover's (1998) reformulation of the Bongaarts et al (1984) model that has been adopted to estimate the fertility inhibiting effect of the proximate determinants of fertility of sexually active women.

5.4.1. BASIC DETERMINANTS OF FERTILITY AMONG RECENT SEXUALLY ACTIVE WOMEN.

Table 5.4.1 shows that the percentage of respondents that are sexually active declined from 77 in 1990 to 64 in 1999 and went up to 65 by 2003. This pattern is also shown in the rural and urban areas with the percentages in the rural being higher than what is

obtained in the urban. The percentage of sexually active women is generally high for respondents with less than secondary level of education. There is a decline in the percentage sexually active over the years among respondents with tertiary (higher) level of education. This is however higher than percentages within the secondary level of education.

Percentage of sexually active women decline over time in the regions except in the North West, which followed the pattern of the total sample and higher in the North compared to the South. A possible reason for these levels and trend is increased school enrolment at all levels in the country in general. The immediate impact is to retain the girl-child in school at least for a longer period of time and limit early sexual debut compared to those that are not in school. In parentheses are the percentages of the sexually active women that are currently married. These are generally high especially among rural and Northern residents as well as in respondents with less than secondary level of education.

Percentage contracepting among the sexually active women follows the opposite trend to that of married active. It increased from 10.2 in 1990 to 17.2 in 1999 and then declined to 14.5 by 2003. The pattern is the same within all the sub groups except in the North East and South West where it increased consistently over time. The percentage of women contracepting is positively related to level of education and is higher for respondents in the urban area compared to those in the rural.

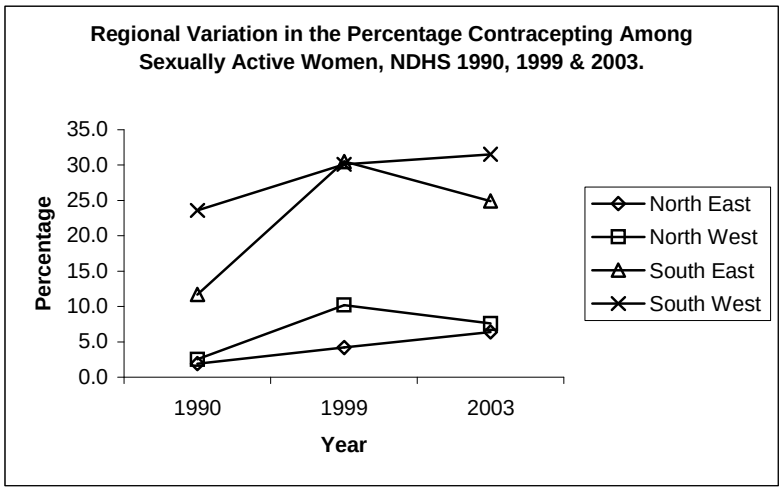


Figure 5.4.1. Regional Variation in the Percentage of Sexually Active Women that are Contracepting, NDHS 1990, 1999 & 2003.

The average duration of breastfeeding declined from 13 months in 1990 to 12 months in 1999 and back to 13 months by 2003. There is not much variation within regional groups but the mean duration is higher in the North compared to the South. There is no definite pattern within education groups either but the mean duration decreases with increase in level of education. The average duration of breastfeeding is same in the rural and urban areas except in 1990 where it is 11 months for the urban and 13 months for the rural residents.

In the total sample of sexually active women, mean duration of amenorrhea declined from 19 months in 1990 to 15 months in 1999 and to 14 months in 2003. This is the trend within all the various groupings except in the South West where it is constant over time. Mean duration of amenorrhea is higher in the North compared to the South, higher in rural compared to urban (for example, it is 13 months and 15 months for urban and rural areas respectively in 1990) and negatively associated with level of education.

Mean duration of abstinence declined over time in the total sample of women. This is 19, 12 and 11 months in 1990, 1999 and 2003 respectively. This is exhibited within regional groups except in the South East. It is however generally higher in the South compared to the North. For education, mean duration of abstinence is higher for respondents with less than secondary level of education (although much higher among those with primary level of education compared to those that have none). The mean duration is 12 months with respondents with secondary level of education over the years and the mean duration is much lower for respondents with tertiary level of education. No definite pattern is seen within the rural and urban categories and not much difference between the two is observed either.

Average duration of postpartum insusceptibility among sexually active women is 26 months in 1990, 18 months in 1999 and 19 months in 2003. This is the pattern shown by the various groupings too except in the North West where the mean duration declined from 27 months in 1990 to 20 months in 1999 and further declined to 18 months by 2003. Other exception to this general rule is also found in the secondary level of education category, where it increased over time while the converse of this is the case for respondents with tertiary level of education. Mean duration of postpartum insusceptibility is negatively related to level of education and found to be higher in the North as well as in the rural area (See Table 5.4.1).

Table 5.4.1. Percentage of Recent Sexually Active Women (with Percentage of it Currently Married in parentheses) by Some Basic Fertility Determinants and Mean Duration (Months) of Postpartum Variables.

	PERCENTAGE		AVERAGE DURATION OF			
RESIDENCE	RS	**C**	BF	AM	ABST	PPI
Urban						
1990	71 (83.9)	20.6	11	14	18	22
1999	58 (89.9)	24.9	12	13	11	16
2003	60 (87.5)	21.1	13	12	12	18
Rural						
1990	81 (93.9)	4.1	13	22	19	28
1999	66 (91.7)	13.9	12	15	13	19
2003	69 (92.2)	10.6	13	15	11	20
EDUCATION						
None						
1990	87 (97.1)	2.6	14	23	20	30
1999	77 (98.1)	5.7	13	18	11	20
2003	81 (97.3)	4.3	14	17	10	21
Primary						
1990	73 (89.3)	12.7	12	14	19	23
1999	61 (90.7)	18.8	11	13	15	18
2003	67 (91.1)	15.6	13	13	14	20
Secondary						
1990	57 (69.4)	29.5	10	10	12	15
1999	47 (80.3)	32.0	11	11	12	15
2003	48 (77.2)	29.4	12	10	12	16
Tertiary						
1990	67 (67.6)	47.6	8	8	8	11
1999	62 (76.9)	49.5	12	8	6	10
2003	53 (83.7)	37.4	11	7	7	10
REGION						
North East						
1990	90 (97.6)	1.9	14	27	19	31
1999	76 (97.2)	4.2	13	16	10	18
2003	75 (95.2)	6.4	13	16	8	19
North West						
1990	89 (97.9)	2.5	13	23	14	27
1999	72 (94.9)	10.2	13	17	12	20
2003	79 (96.4)	7.6	14	14	9	18
South East						
1990	67 (84.1)	11.7	12	14	20	24
1999	53 (79.6)	30.5	11	12	13	16
2003	52 (79.4)	24.9	12	11	17	20
South West						
1990	68 (81.7)	23.6	11	12	21	22
1999	55 (90.1)	30.1	11	12	14	16
2003	53 (84.3)	31.5	12	12	14	17

TOTAL						
1990	77 (90.2)	10.2	13	19	19	26
1999	64 (91.1)	17.2	12	15	12	18
2003	65 (90.5)	14.5	13	14	11	19

RS – Recent sexually active PPI - Postpartum insusceptibility AM – Amenorrhea
C - Contracepting ABST - Abstinence BF – Breastfeeding
C, BF, AM, ABST & PPI based on Proportion sexually active.

5.4.2. PROXIMATE DETERMINANTS OF FERTILITY AMONG RECENT SEXUALLY ACTIVE WOMEN.

The indices of the proximate determinants of fertility calculated in this section was done using the Stover's 1998 reformulation of the Bongaarts et al (1984) model for the analysis of proximate determinants of fertility. Stover (1998) proposed some refinement to the Bongaarts formulation. He argued that since the index of marriage is intended to represent the effect of periods during which a woman is not sexually active, the proportion sexually active in the last month plus women who are not now sexually active but who are currently pregnant or abstaining postpartum (since they have recently been exposed to the risk of pregnancy) should be used in place of proportion of married women aged 15-49 that is usually used. He also modified the components used in the calculation of the index of abortion and that of contraception.

The index of sexual activity (Cx) is the proportion sexually active and is (as discussed as percentages) in section 5.4.1 above. As shown in Table 5.4.2a below, the index of contraception (Cu) did not follow a linear trend over the years. In the total sample of sexually active women, it declined from 0.87 in 1990 to 0.82 in 1999 and went up to 0.86 by the year 2003. This pattern is generally observed in all the sub groups examined except in the North East where it declined from 0.97 in 1990 to 0.95 in 1999 and 0.94 in

2003. The index is higher in the North and rural area. It also decreases as level of education increases.

The index of insusceptibility (Ci) in the total sample of sexually active women increased from 0.45 in 1990 to 0.55 in 1999 and then declined to 0.53 by 2003. The pattern is similar in the various groupings. The index is higher in the rural area and increases as level of education increases. No notable difference is found between the regional groups.

For the index of sterility, there is a small increase over time (0.87, 0.87 and 0.88 in 1990, 1999 and 2003 respectively). The index declined over time in the urban area while the opposite is the case in the rural but consistently higher in the rural compared to the urban. The index is found to be higher among respondents with some level of education. It also declined over the years within the education categories except between 1999 and 2003 for respondents with no education and those with secondary level of education. For region, the pattern within groups is mixed. The index is however higher in the North compared to the South.

Potential fertility (PF) is defined as the total fertility rate for a population of sexually active and fecund women for the entire period from age 15 to 49 and who do not practice breastfeeding, experience postpartum abstinence, nor practice contraception. It is estimated here by dividing the total fertility rate by the combined effect of the four fertility-inhibiting indices. The value for each sub group and for the total sample of

sexually active women examined in this study is presented in the last column of Table 5.4.2a.

Potential fertility in the total sample declined from 24.01 in 1990 to 21.43 in 1999 and rose again to 22.32 by 2003. This pattern is found within the urban area and in all the regions except North West where it declined over time. Potential fertility declined over time in the rural and consistently higher in the rural compared to the urban. There is no much difference in potential fertility between the regional groups and it is found to be negatively associated with education. Potential fertility generally declined for respondents with less than secondary level of education and increased for those with secondary and above levels of education.

Table 5.4.2a. Proximate Determinants of Fertility Among Recent Sexually Active Women, NDHS 1990, 1999 and 2003.

		Cx	Cu	Ci	Cf	Observed TFR	Calculated PF
RESIDENCE							
Urban	1990	0.71	0.78	0.49	0.91	5.43	21.99
	1999	0.58	0.75	0.58	0.90	4.57	20.13
	2003	0.60	0.80	0.55	0.89	5.10	21.71
Rural	1990	0.81	0.95	0.43	0.85	6.95	24.68
	1999	0.66	0.85	0.53	0.85	5.75	22.64
	2003	0.69	0.90	0.52	0.88	6.31	22.33
EDUCATION							
None	1990	0.87	0.97	0.41	0.82	7.46	26.36
	1999	0.77	0.94	0.52	0.81	6.94	22.85
	2003	0.81	0.96	0.51	0.83	7.65	23.13
Primary	1990	0.73	0.86	0.48	0.94	6.82	24.21
	1999	0.61	0.81	0.55	0.90	5.70	23.20
	2003	0.67	0.86	0.52	0.89	6.37	23.81
Secondary	1990	0.57	0.73	0.60	0.97	4.65	19.22
	1999	0.47	0.72	0.60	0.95	4.71	24.44
	2003	0.48	0.75	0.58	0.96	4.43	22.22

Tertiary	1990	0.67	0.59	0.68	0.98	2.55	9.69
	1999	0.62	0.58	0.70	0.93	2.39	10.22
	2003	0.53	0.70	0.70	0.92	2.79	11.70
REGION							
North East	1990	0.90	0.97	0.40	0.80	6.83	24.57
	1999	0.76	0.95	0.55	0.84	6.71	20.21
	2003	0.75	0.94	0.53	0.86	7.29	22.74
North West	1990	0.89	0.97	0.44	0.86	7.84	23.97
	1999	0.72	0.88	0.52	0.84	5.82	21.00
	2003	0.79	0.93	0.55	0.87	6.63	18.86
South East	1990	0.67	0.87	0.47	0.89	6.05	24.81
	1999	0.53	0.72	0.58	0.90	4.61	23.07
	2003	0.52	0.79	0.52	0.90	4.56	23.72
South West	1990	0.68	0.76	0.49	0.94	5.46	22.84
	1999	0.55	0.69	0.58	0.91	4.50	22.44
	2003	0.53	0.70	0.56	0.92	4.31	22.48
TOTAL							
	1990	0.77	0.87	0.45	0.87	6.32	24.01
	1999	0.64	0.82	0.55	0.87	5.37	21.43
	2003	0.65	0.86	0.53	0.88	5.82	22.32

Table 5.4.2a gives the indices of the proximate determinants of fertility of sexually active women. In the total sample, the index of insusceptibility has the most fertility inhibiting effect followed by indices of sexual activity, contraception and sterility in that order. A number of departures to this general rule are however found in the sub groups. Of great importance is to note that the index of contraception has the least inhibiting effect in the rural, among respondents with no education and in the North East and North West. It is equally of note the influential role on fertility that the index of sterility has especially in the North West and among respondents with no level of education in 1990 (see Table 5.4.2a for further details).

Jointly, the indices reduced 17.69 births in the total sample of sexually active women in 1990; 16.06 births in 1999 and 16.50 births in 2003. Table 5.4.2b shows the details of the absolute as well as percentage reduction in total fertility due to each of the determinants in the total sample as well as in the various sub groups.

Table 5.4.2b. Absolute and Percentage reduction from potential fertility to observed total fertility due to the determinants and the absolute reduction from total fecundity to total fertility rate (the latter in the sixth column: PF - TFR).

			Absolute reduction					Percentage reduction	
RESIDENCE	**Cx**	**Cu**	**Ci**	**Cf**	**PF - TFR**	**Cx**	**Cu**	**Ci**	**Cf**
Urban									
1990	2.22	2.16	10.21	1.98	16.56	13.39	13.03	61.63	11.95
1999	3.31	2.63	7.61	2.01	15.56	21.27	16.88	48.90	12.94
2003	3.40	2.13	8.69	2.39	16.61	20.47	12.80	52.35	14.38
Rural									
1990	1.63	0.45	11.97	3.68	17.73	9.19	2.55	67.52	20.74
1999	2.96	1.54	9.09	3.31	16.89	17.53	9.10	53.80	19.57
2003	2.83	1.02	9.38	2.79	16.02	17.69	6.34	58.54	17.42
EDUCATION									
None									
1990	1.11	0.27	12.72	4.80	18.90	5.90	1.40	67.31	25.38
1999	2.07	0.58	8.85	4.41	15.91	13.03	3.62	55.63	27.72
2003	1.79	0.39	9.45	3.84	15.48	11.59	2.54	61.06	24.80
Primary									
1990	2.52	1.52	11.77	1.57	17.39	14.51	8.75	67.69	9.05
1999	3.64	2.19	9.44	2.23	17.50	20.82	12.52	53.93	12.73
2003	3.14	1.55	10.20	2.55	17.44	17.99	8.88	58.52	14.61
Secondary									
1990	3.51	3.02	7.45	0.60	14.57	24.07	20.71	51.13	4.09
1999	5.31	3.90	9.28	1.25	19.73	26.91	19.75	47.02	6.32
2003	4.80	3.08	8.91	1.00	17.79	26.98	17.30	50.10	5.62
Higher									
1990	1.26	2.64	3.04	0.20	7.14	17.59	37.04	42.52	2.85
1999	1.46	2.79	2.85	0.73	7.83	18.71	35.65	36.38	9.27
2003	2.47	2.26	3.22	0.96	8.91	27.76	25.31	36.16	10.77
REGION									
North East									
1990	0.76	0.23	11.74	5.01	17.74	4.28	1.32	66.15	28.25
1999	2.12	0.46	7.60	3.31	13.50	15.69	3.44	56.32	24.55
2003	2.43	0.62	9.17	3.23	15.45	15.73	4.02	59.35	20.90

North West									
1990	0.97	0.27	11.56	3.33	16.13	6.01	1.69	71.65	20.66
1999	2.26	1.10	8.48	3.34	15.18	14.91	7.26	55.84	21.99
2003	1.76	0.63	7.38	2.45	12.23	14.41	5.17	60.38	20.05
South East									
1990	2.98	1.35	11.70	2.73	18.76	15.88	7.19	62.38	14.55
1999	4.09	3.38	8.75	2.24	18.46	22.15	18.33	47.40	12.12
2003	4.21	2.33	10.25	2.37	19.16	21.97	12.17	53.48	12.38
South West									
1990	2.57	2.54	11.00	1.28	17.38	14.78	14.59	63.27	7.36
1999	3.68	3.68	8.59	2.00	17.94	20.52	20.49	47.86	11.13
2003	3.82	3.49	9.13	1.73	18.17	21.04	19.19	50.25	9.53
TOTAL									
1990	1.89	1.23	11.53	3.05	17.69	10.67	6.93	65.16	17.24
1999	3.02	1.84	8.37	2.83	16.06	18.80	11.47	52.12	17.61
2003	3.13	1.46	9.23	2.68	16.50	18.99	8.83	55.95	16.23

5.5. DISCUSSION

The Bongaarts et al (1984) model and its refinement by Stover (1998) were used in the estimation of the proximate determinants of fertility in this study. Bongaarts et al (1984) showed that the differences in fertility among populations are largely due to five proximate determinants namely: marriage, contraception, induced abortion, postpartum infecundability and pathological sterility. Stover's (1998) refinement of the Bongaarts formulation uses the proportion sexually active in the last month plus women who are not now sexually active but who are currently pregnant or abstaining postpartum (since they have recently been exposed to the risk of pregnancy) as the population directly exposed to pregnancy. He also modified the components used in the calculation of the index of abortion (by multiplying contraceptive prevalence by the effectiveness to describe more accurately the proportion of women protected by contraception) and the index of contraception (by removing infecundity consideration since it is now included in the sterility index).

The two models relate total fertility to total potential fertility (referred to as total fecundity in the Bongaarts et al model and potential fertility in the Stover's model) reduced by a number of indices, each of which reflects the fertility inhibiting effect of a proximate determinant. The indices range from 0 to 1 for most of the proximate determinants. The lower the index, the more influential the proximate determinant is in reducing the total fecundity/potential fertility (i.e. the level of fertility that would occur in the absence of all the proximate determinants). An index of 0 implies total reducing effect on fertility and index of 1 implies no effect whatsoever.

Analysis of the mean durations of breastfeeding, amenorrhea, abstinence and postpartum insusceptibility in the two groups indicate that these postpartum practices last substantially longer than in many parts of the world although there is wide variation between the sub groups (Mhloyi, 1984; van de Walle and Omideyi, 1988; Jolly and Gribble, 1993). The mean duration of breastfeeding is lower among sexually active women compared to the currently married ones in the total sample as well as in all the sub groups for all the years. The mean duration of amenorrhea is the same for the two groups of women or one month higher (in some cases) among the sexually active women. Mean duration of postpartum abstinence and postpartum insusceptibility are higher among sexually active women compared to the currently married women in all cases. This is not surprising as resumption of sexual activity could take a considerably longer time among sexually active women compared to the married ones who are more likely to be regularly exposed to sexual activity by virtue of their marital status.

Among the proximate determinants indices (from using both models), the index of postpartum insusceptibility has the greatest inhibiting effect, followed by that of marriage/sexually active, contraception and then sterility. Other studies also found this order in the indices of proximate determinants (Gaisie, 1984; Ferry and Page, 1984; Mhloyi, 1984; Adegbola, 1987; Jolly and Gribble, 1993). However, Odimegwu (1996) found the order of influence of the indices among the Igbo of the South East, Nigeria to be index of marriage, index of contraception and then that of insusceptibility. A notable exception to the general order in this study was found among women with tertiary level of education. This could be accounted for by later age at union, higher prevalence of contraceptive practice and shorter duration of postpartum insusceptibility among this group of women.

All the indices estimated using the Bongaarts et al formulation are higher when compared to their equivalents in the Stover's refinement. This implies that the Stover's indices should be more influential in reducing total potential fertility and this is translated into higher potential fertility (PF) in the Stover's model compared to total fecundity (TF) in the Bongaarts et al formulation (as shown in Tables 5.3.2 and 5.4.2).

A number of factors contributed to the differences in the proximate determinants indices in the two models although the relationships of these factors to the indices are not consistent, such that explaining them could be difficult. First is the use of currently married women for the index of marriage in the Bongaarts et al formulation and using

sexually active women for its equivalent in the Stover's refinement. Apart from the fact that the percentage married is generally higher than those in sexual union, the percentages of currently married among sexually active women (in parentheses of column 2, Table 5.4.1) are quite high and higher than percentages of those that are sexually active among currently married women (as shown in parentheses of column 3, Table 5.3.1) on the average. This implies a lower percentage of married women that are not sexually active and could be additional reason why the indices of marriage were greater than those of sexually active.

The contraceptive and postpartum behaviour of married women certainly differ from those that are not married. Since they are in a stable union, they are easily exposed to sexual activity and the level of use of contraception will be much lower as childbearing is a major fall out of marital union especially in a setting such as Nigeria where marriage and childbearing is almost universal. In addition to the difference in the contraceptive behaviour of the two groups of women, the Bongaarts et al formulation adjusted for infecundity in the calculation of the contraceptive index. This translates into lower value of the index, which actually increased the value of total fecundity. This adjustment factor was omitted from the Stover's model to avoid possible overlap (especially at age group 45-49) of sterilization and infecundity.

The formula used in the calculation of the index of sterility in the Bongaarts et al model is based on the assumption of three percent primary sterility among married women aged 45-49 by Frank (1983). This was however not the case in many of the sub groups

examined in this study, which is consistent with lower levels of sterility found in West Africa (Bongaarts et al 1984). This lower level of primary sterility led to many of the values of the index being greater than one, implying increased actual fertility and a narrowing in the gap between actual fertility and total fecundity.

The range for the value of total fecundity in the Bongaarts et al formulation is 13-17 while Stover in his refinement obtained a value of about 21 with a range of 18 to 24 for potential fertility. He attributed the difference in the values of total fecundity and potential fertility to the fact that 30 years of reproductive life was factored into the former while 35 years was used in the computation of the latter. Another reason is the inclusion of natural fertility in total fecundity whereas Stover incorporated infecundity into its own index.

Following Bongaarts logic and using women aged 15-49 years, an estimate of total fecundity with its range is derived here for 35 years of reproductive life. Subtracting 17 percent for the period that the average woman is sterile leaves 29 years. If the average birth interval in the absence of contraception and breastfeeding is 20 months, then total fecundity is about 17. Using a range for the average birth interval of 17.5 to 22.5 months implies a range of total fecundity of 15 to 20. This range overlaps with that given by Stover and shows that the Bongaarts and Stover's ranges are quite close if the same reproductive time span is imputed.

Although there is a wide variation in the values of total fecundity (TF), 21 of the 27 values (that is when the secondary and tertiary levels of education are excluded) fall within the Bongaarts range while five are above the upper range of 17 (all 1990 values. The reason for this is not apparent). All the values of the total fecundity for secondary and tertiary levels of education were much lower than the lower limit of the two ranges, which is consistent with the pattern of lower fertility with high levels of education. However, the average of all the total fecundity estimates in this study is 14.94. This is similar to the estimate of about 15 derived by Bongaarts with a range of 13 to 17.

Twenty-six of the thirty potential fertility values (excluding those for tertiary level of education) obtained fall within the range estimated by Stover. The values for respondents at the tertiary level of education were considerably lower (implying low total potential fertility). Four of the 1990 values are also higher than the upper limit. The mean value of 21.61 derived for potential fertility is however the same as a value of about 21 with a range of 18 to 24 estimated in the original formulation and similar to the average value of 22.6 for 15 DHS countries obtained by Stover in 1998.

Other reasons that could account for the wide variation in estimates of total fecundity and potential fertility (including within and between regional and socio-economic strata) in addition to observed difference in the indices used include: the exclusion of abortion in the model, errors in the data set or in the measurement of some variables as well as biases within the proximate determinants model. Although reliable data on abortion in Nigeria is non-existent, there is no evidence that it is high. However, not including it in the model could have an effect on the estimates of total fecundity and potential fertility (especially

in areas where it is high) because its inhibiting effect on fertility was not factored in. Errors in the data will include giving approximation for age at marriage and postpartum variables and incorrect reporting of sexual activity and contraception.

On biases within the proximate determinants model, Menken (1984) and Reinis (1992) found that the (Bongaarts) model produces very good estimates under the assumption of random use of contraception. However, Reinis found that with non-random use of contraception (which is more likely given that women tend to use contraception depending on their family building plans), the estimates produced (except for the index of postpartum insusceptibility) are less accurate. In particular, the model performs poorly when women use contraception to stop rather than to space births; when there is delayed marriage and when contraceptive use is most prevalent at the oldest ages, which happens when large families are sought (Jolly and Gribble, 1993).

Although differences exist in the base population and the definition of other input data as well as in the magnitude of the proximate determinants indices and their effect on total potential fertility in the two formulations, the proximate determinant that has the most influential effect on fertility in both formulations (as attested to by their reducing effect on fertility in Tables 5.3.3 and 5.4.3) are: postpartum insusceptibility, marriage/sexual activity, contraception and sterility in that order. Births were reduced by 12.46, 8.90 and 9.45 in 1990, 1999 and 2003 respectively by the indices while potential fertility (using Stover's model) was reduced by 17.69, 16.06 and 16.50 in the three survey years respectively. Some exceptions to this general rule are found in the sub groups of which tertiary level of education is particularly worthy of note. The order of importance of the

proximate determinants for this education group is as follows: Marriage/sexual activity, contraception, postpartum insusceptibility and sterility. From this analysis, the proximate determinants of fertility in Nigeria remain the same as the ones identified by the national study by Adegbola (1987) using the World Fertility Survey (WFS) and the order of importance has not changed.

This order might however change in the near future as the gaps within and between the basic determinants are closing up leading to values of the indices being quite close in many cases. For example, the percentages of women that are currently married and sexually active have been declining over time, the percentage of women using contraception is increasing, and average duration of postpartum infecundability and primary sterility are reducing. Similarly, in 1999 and 2003, the fertility inhibiting effect of the index of marriage is less than one birth per woman. The convergence in these trends is bound to change the order of importance of the proximate determinant indices derived from these basic determinants and hence, their inhibiting effect on fertility.

CHAPTER 6

FERTILITY PREFERENCES AND ACHIEVEMENTS

6.0. INTRODUCTION

One of the objectives of this study is to estimate the levels, trend and differentials in the extent to which people are achieving their fertility preferences (i.e. fertility preference implementation). This is very important for programme and policy purposes. For example, it could be a pointer to the extent to which available reproductive health services in the country have assisted couples and individuals to achieve their reproductive intentions. To address this objective, examination of the number of children desired by and the short-term reproductive intention of women was done. This is followed by the estimation of the levels as well as the contribution of the degree of fertility preference implementation to fertility changes between periods by some selected background characteristics of the respondents.

6.1. NUMBER OF CHILDREN DESIRED

One of the most common measure of reproductive preferences is the ideal number of children or the number of children desired. Women with no living children were asked ‘if you could choose exactly the number of children to have in your whole life, how many would that be?’ while those that have living children were asked ‘If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?’ Table 6.1 below gives the mean

number of children desired and the percentage of non-numeric response to the question by the total sample of women by some of their characteristics.

The mean desired number of children in the total sample of women increased from 4.91 in 1990 to 5.05 in 1999 and 5.19 in 2003. This increase over the years is also found in almost all the various sub groups although the variations in the total sample and the sub groups are small. For example, the highest difference of 0.42 between 1990 and 2003 is found among women from the North West. However, the observed increase in the mean number of children desired between 1990 and 1999 should be interpreted with caution, as percentage of non-numeric response is particularly high in the 1990 survey (57.3%). This is likely to bias the estimate of the mean number of children for 1990 downward, as respondents who give non-numeric responses are often those who desire large families or as many as God gives.

The mean number of children desired increases as age and number of surviving children of respondents' increases in the three data sets. Number of desired children is lower among respondents from the urban area compared to those from the rural area, decreases with increase in level of education and is generally lower for respondents from the South compared to those from the North. Currently married women desire more number of children compared to formerly married women (although this is small: 0.1, 0.08 and 0.24 in 1990, 1999 and 2003 respectively) and never married women.

Table 6.1. Mean Number of Children Desired by Total Sample of Women by Some Selected Background Characteristics

Background characteristics	1990		1999		2003	
	MNCD	**NNR %**	**MNCD**	**NNR %**	**MNCD**	**NNR %**
Age						
15-19	4.70	46.7	4.80	16.9	4.96	10.1
20-24	4.70	48.8	4.88	14.3	5.02	7.1
25-29	4.88	55.1	5.02	15.7	5.18	8.7
30-34	5.21	63.6	5.18	17.6	5.33	11.8
35-39	5.13	64.8	5.31	21.2	5.44	15.5
40-44	5.31	70.7	5.36	21.0	5.45	15.8
45-49	5.27	71.6	5.39	23.8	5.55	15.2
Residence						
Urban	4.64	43.9	4.73	16.5	5.00	10.2
Rural	5.21	66.3	5.21	18.2	5.32	11.5
Education						
None	5.31	77.5	5.52	28.8	5.66	18.6
Primary	5.08	47.0	5.17	13.9	5.27	9.4
Secondary	4.59	25.4	4.66	8.0	4.79	4.3
Tertiary	4.15	14.2	4.22	6.1	4.54	3.1
Region						
North East	5.21	74.6	5.19	34.1	5.40	22.1
North West	5.11	81.0	5.27	18.3	5.53	5.8
South East	5.10	43.5	5.08	9.2	5.06	6.5
South West	4.61	41.2	4.71	10.4	4.68	5.1
Marital status						
Never married	4.54	30.7	4.53	10.9	4.71	5.8
Currently married	5.08	64.2	5.26	20.1	5.40	13.1
Formerly married	4.98	54.7	5.18	17.8	5.16	10.1
# of surviving children						
0	4.58	43.6	4.62	13.4	4.80	7.5
1	4.73	60.5	5.01	17.6	5.09	10.9
2	4.87	62.0	5.06	16.2	5.24	9.3
3	5.06	65.5	5.13	18.7	5.45	9.8
4	5.20	61.0	5.38	20.3	5.52	13.9
5	5.33	60.5	5.53	20.7	5.54	14.5
6+	5.59	65.2	5.69	24.9	5.73	18.6
Total	4.91	57.3	5.05	17.6	5.19	11.0

MNCD – Mean number of children desired
NNR – Non-numeric response

Over half of the respondents in 1990 gave non-numeric response to the question on desired number of children. This high percentage is suspect judging by the way it nose dived from 57.3% in 1990 to 17.6% in 1999 and 11.0% by 2003. The pattern of non-numeric responses is similar to that of average desired number of children except that it declined over the years whereas average desired number increased over time. Non-numeric response is higher among respondents from the rural area and the North; is positively associated with age and number of surviving children; decreases as level of education increases and higher among respondents that are currently married compared to those in the never married and formerly married categories.

6.2. REPRODUCTIVE INTENTIONS

Reproductive intentions of women are assessed to represent the women's short-term fertility preferences. Respondents were asked: 'Would you like to have (a/another) child, or would you prefer not to have any (more) children?' Those that would like to have a/another child were then asked: 'How long would you like to wait from now before the birth of a/another child?' These questions were asked from currently married women in the 1990 NDHS while they were addressed to all the respondents in the 1999 and 2003 surveys.

Only the sub set of currently married women is used in this analysis. This is because there were a number of women who are unmarried and not even sexually active that would want to have children sometime in future when they are ready. Including them in analysis would bias the number of women that wants to have a child (say after two years)

upwards, whereas, that is not the case. Using only currently married women also allowed for comparability of the three data sets since the variable is available for only currently married women in the 1990 data set.

In the analysis of this work, women that were unsure of the time they want a/another child and those that were undecided whether they want a/another child or not were grouped together with those that want within two years (since any time could have been a good time for them) while those that are sterilized were grouped together with those that want no more. Women, who respond that they want a/another child, but when asked when they would like the next child, responded that they could not get pregnant, are in the 'declared as infecund' category (MEASURE DHS+, 2004). Table 6.2 gives the percentage distribution of currently married women according to their reproductive intention.

Table 6.2. Percentage Distribution of Currently Married Women by Reproductive Intentions, NDHS 1990, 1999 and 2003.

Background Characteristics	Want within 2 years	Want after 2 years	Want no more	Declared Infecund	Total number
1990					
Age					
15-19	52.2	45.5	1.6	0.7	573
20-24	51.0	44.6	3.2	1.2	1182
25-29	48.3	42.8	7.2	1.6	1466
30-34	49.9	33.1	14.5	2.6	1325
35-39	45.2	22.4	27.7	4.6	887
40-44	40.7	11.0	37.0	11.2	724
45-49	30.8	7.6	45.8	15.8	526
Residence					
Urban	43.1	33.0	21.3	2.6	2358
Rural	48.8	32.3	13.8	5.1	4325
Education					
None	50.4	29.8	13.9	5.9	4192
Primary	42.0	33.9	22.4	1.7	1535
Secondary	38.2	44.5	16.7	0.6	834
Tertiary	43.4	26.2	28.7	1.6	122
Region					
North East	53.1	32.0	8.6	6.3	1877
North West	51.3	34.6	9.3	4.8	1560
South East	43.6	29.4	23.2	3.8	1504
South West	38.7	33.9	25.5	1.8	1742
# of surviving children					
0	66.0	23.2	1.5	9.2	783
1	49.2	43.7	4.1	2.7	1093
2	50.3	40.8	5.1	3.7	1129
3	48.3	38.1	9.8	3.9	1009
4	43.1	35.0	18.9	3.0	904
5	42.4	25.5	27.8	4.3	695
6+	31.0	16.4	48.8	3.8	1070
Total	46.8	32.5	16.5	4.2	6683
1999					

Age					
15-19	59.7	37.4	0.9	2.0	454
20-24	50.7	47.6	1.2	0.6	906
25-29	52.8	41.0	5.0	1.2	1230
30-34	52.1	30.9	15.0	2.0	1010
35-39	47.2	16.0	32.2	4.6	892
40-44	34.4	8.2	50.9	6.4	607
45-49	18.8	3.0	61.4	16.8	464
Residence					
Urban	45.2	26.4	24.9	3.5	1705
Rural	48.0	30.4	17.8	3.8	3858
Education					
None	52.1	26.1	16.5	5.3	2917
Primary	39.8	31.2	26.2	2.8	1262
Secondary	43.4	38.0	17.6	1.0	1079
Tertiary	43.6	19.3	35.1	2.0	305
Region					
North East	57.0	27.7	9.7	5.7	1564
North West	52.2	30.6	13.7	3.5	1601
South East	40.1	28.1	29.2	2.6	1125
South West	34.9	30.2	32.3	2.6	1273
# of surviving children					
0	71.5	22.4	1.6	4.4	562
1	57.0	39.3	1.1	2.6	913
2	51.7	40.9	5.3	2.0	899
3	46.1	37.3	12.9	3.7	863
4	44.9	25.9	24.8	4.4	753
5	38.5	21.5	35.3	4.7	615
6+	27.3	12.7	55.1	4.8	958
Total	47.1	29.2	20.0	3.7	5563
2003					

Age					
15-19	59.7	39.0	1.2	-	484
20-24	47.0	51.1	1.8	0.1	822
25-29	45.6	49.9	4.3	0.3	1115
30-34	48.7	37.3	13.8	0.1	833
35-39	45.2	22.2	30.5	2.0	747
40-44	35.2	9.8	45.1	9.8	610
45-49	18.2	3.4	56.2	22.3	534
Residence					
Urban	41.3	33.2	22.5	3.0	1864
Rural	44.8	33.6	17.3	4.4	3281
Education					
None	46.5	31.0	16.5	6.0	2688
Primary	40.2	33.0	24.4	2.4	1172
Secondary	39.9	42.1	16.9	1.1	1028
Tertiary	41.6	26.1	32.3	-	257
Region					
North East	48.3	32.0	14.5	5.2	1881
North West	43.9	40.2	11.5	4.5	1434
South East	39.6	26.8	30.8	2.7	1032
South West	36.7	33.2	28.9	1.1	798
# of surviving children					
0	69.8	25.4	1.0	3.8	603
1	51.5	45.3	0.8	2.4	837
2	48.4	44.3	5.3	1.9	826
3	47.2	40.3	9.6	2.9	720
4	37.8	34.6	24.0	3.6	674
5	33.2	24.7	37.5	4.7	576
6+	22.1	17.3	53.1	7.5	909
Total	43.5	33.4	19.2	3.9	5145

Table 6.2 above shows that in the total sample of women, the percentage of those that want to have a/another child within two years declined from 46.8% in 1990 to 43.5% by 2003. The pattern is the same for those that are declared infecund while the opposite is found over the years for respondents that want to have a/another child after two years and those that want no more children. In general however, the percentage of those that want to have a/another child within two years and those that want after two years decreases along the age groups while the percentage of those that want no more children and those that are declared infecund increases as age increases for all the survey years.

Those that want to have a/another child within two years and those declared infecund are more in the rural while there are more respondents who want no more children in the urban area. Not much difference between the rural and urban areas is observed in the percentage of those that want a/another child after two years except in 1999 where the percentages are 26.4 and 30.4 in the urban and rural areas respectively. A mixed pattern is seen in the percentages of those that want a/another child within two years among rural and urban residents over the years.

However, between 1990 and 2003, there is a decline in the percentage of women that want a/another child within two years, an increase in the percentage of those that want no more children while the percentage of those that want after two years is basically the same. The percentage increased among the urban respondents and decreased among the rural respondents for the infecunds between the two periods. There is no definable pattern among the educational levels or over the years as far as those that want a/another child within two years is concerned.

In 1990, over half of the respondents from the North want a/another child within two years while this is about two-fifths in the South. About a third of the respondents in the four regions want to have a/another child after two years. In 1999, those that want a/another child within two years are about a third in the South West, two-fifths in the South East and more than 50% in the two other regions in the North. Respondents that want a/another child after two years ranged between 27.7% in the North East to 30.6% in

the North West in this year. A decline in the percentage of respondents who want a/another child within two years is observed in 2003 when compared to the previous survey years while those that want a/another child after two years range between 26.8% in the South East and 40.2% in the North West for this year. Percentage of respondents that want no more children is higher (more than twice) in the South compared to the North while the percentage of those declared infecund is higher in the North when compared to the South in all the survey years. The percentage of those that want a/another child within two years increased between 1990 and 1999 in the North while the percentage of those that want after two years declined between the two periods in all the regions. The reverse is generally the case between 1999 and 2003 for those who want a/another child within two years and those who want after two years. For respondents that want no more, the percentage increased over the period of the three surveys for the four regions except between 1999 and 2003 in the North West and South West where it declined from 13.7% to 11.5% and 32.3% to 28.9% respectively.

Percentage of respondents that want a/another child generally declines as number of surviving children increases in all the years. The situation is the same for those that want another after two years except when number of surviving children is less than two. Those that want no more increases as number of surviving children increases (except for those that have no surviving child in 2003) while the percentage of those that are declared infecund also increases as number of surviving children increases except when number of surviving children is less than two. The pattern here is mixed over the years especially between 1990 and 1999. However, percentage of those that want a/another child within

two years and those that want no more generally declined between 1999 and 2003 while the percentage of those that want after two years increased within the period.

6.3. FERTILITY PREFERENCE IMPLEMENTATION.

This section basically examines the extent to which women have been able to translate their wanted fertility into reality (actual fertility behaviour measured by TFR) given their natural fertility. The framework used for this purpose is adapted from the Bongaarts (1993) variant of the supply-demand framework for the determinants of fertility. The Bongaarts formulation holds that actual fertility (F) as measured by total fertility rate is an outcome of the interaction of supply of births (natural fertility), demand for births (wanted fertility) and degree of fertility preference implementation (an index that measures the extent to which people are able to implement their fertility preferences). The degree of preference implementation is in turn dependent on cost of fertility regulation and that of unwanted childbearing. The model is specified thus:

$$F = F_w \times I_p + F_n \times (1 - I_p) \qquad (1)$$

where F is the total fertility rate (TFR), F_w is wanted fertility (calculated like the TFR but with unwanted children removed from the numerator), F_n is total natural fertility [F_n = F/C; C = 1 – 1.02 x U; where U represents the proportion of married women who practice contraception] and I_p is the index of preference implementation with values ranging from 0 to 1. With full preference implementation (demand equals supply), I_p = 1 and I_p is 0

with no preference implementation (This implies a substantial level of unwanted childbearing and observed (actual) fertility will be equal to natural fertility).

Since F, F_w and F_n can be calculated from the survey data sets, I_p remain the only unknown. The equation is thus rearranged making I_p the subject of the formula thus:

$$I_p = (F_n - F)/(F_n - F_w) \quad (2)$$

Equation 2 is used to derive the index of preference implementation among currently married women and among couples. These are presented in Tables 6.3.1.1 and 6.3.2.1 below respectively. Tables 6.3.1.2 and 6.3.2.2 present the percentage change in Fn, Fw and Ip (the three determinants of fertility in this model) between periods while Tables 6.3.1.3 and 6.3.2.3 present the absolute and percentage contribution of the three determinants of fertility to the observed change between periods.

6.3.1. INDEX OF FERTILITY PREFERENCE IMPLEMENTATION AMONG CURRENTLY MARRIED WOMEN

6.3.1.1. Estimation of the index of fertility preference implementation among currently married women

Table 6.3.1.1 presents the indices of fertility preference implementation among currently married women by some of their background characteristics. The table shows that in the total sample of currently married women, total fertility rate (F), natural fertility (Fn) and wanted fertility (Fw) all follow the same pattern over the years. They declined between 1990 and 1999 and thereafter increased between 1999 and 2003. The index of preference implementation (Ip) on the other hand follows the exact opposite of this with an increase

from 0.73 in 1990 to 0.89 in 1999 and a decline to 0.76 by 2003. The observed fall and then increase in actual, natural and wanted fertility over the periods is likely to be a result of the omission of births in the 1999 data set, which has had the effect of lowering fertility measures for the survey year in general. This equally impacted on the extent to which people have been able to implement their fertility preferences (Ip), which rose between 1990 and 1999 (while the other measures fell) and then declined between 1999 and 2003 when the other measures increased. However, between 1990 and 2003, actual, natural and wanted fertility declined while the extent to which people implement their fertility preferences rose.

Table 6.3.1.1. Indices of fertility implementation for currently married women with values used in its derivation

	U	C	F	Fn	Fw	Ip
RESIDENCE						
Urban						
1990	0.163	0.834	5.43	6.51	5.18	0.81
1999	0.224	0.772	4.57	5.92	4.44	0.91
2003	0.193	0.803	5.10	6.35	4.84	0.83
Rural						
1990	0.034	0.965	6.95	7.20	6.77	0.58
1999	0.117	0.881	5.75	6.53	5.63	0.87
2003	0.096	0.902	6.31	6.99	6.00	0.69
EDUCATION						
None						
1990	0.027	0.972	7.46	7.67	7.30	0.57
1999	0.059	0.940	6.94	7.38	6.85	0.83
2003	0.046	0.953	7.65	8.03	7.44	0.64
Primary						
1990	0.117	0.881	6.82	7.74	6.49	0.74
1999	0.197	0.799	5.70	7.13	5.53	0.89
2003	0.163	0.834	6.37	7.64	5.94	0.75
Secondary						
1990	0.231	0.764	4.65	6.08	4.27	0.79
1999	0.266	0.729	4.71	6.46	4.52	0.90
2003	0.269	0.726	4.43	6.11	4.13	0.85
Tertiary						
1990	0.395	0.597	2.55	4.27	2.50	0.97
1999	0.435	0.556	2.39	4.30	2.31	0.96
2003	0.335	0.658	2.79	4.24	2.64	0.91

REGION						
North East						
1990	0.018	0.982	6.83	6.96	6.68	0.46
1999	0.038	0.961	6.71	6.98	6.61	0.73
2003	0.041	0.958	7.29	7.61	7.09	0.61
North West						
1990	0.023	0.977	7.84	8.03	7.77	0.73
1999	0.098	0.900	5.82	6.47	5.73	0.88
2003	0.07	0.929	6.63	7.14	6.48	0.77
South East						
1990	0.096	0.902	6.05	6.71	5.76	0.69
1999	0.253	0.742	4.61	6.21	4.45	0.91
2003	0.216	0.780	4.56	5.85	4.12	0.75
South West						
1990	0.182	0.814	5.46	6.70	5.19	0.82
1999	0.263	0.732	4.50	6.15	4.37	0.93
2003	0.298	0.696	4.31	6.19	3.86	0.81
TOTAL						
1990	0.08	0.918	6.32	6.88	6.11	0.73
1999	0.15	0.847	5.37	6.34	5.25	0.89
2003	0.131	0.866	5.82	6.72	5.53	0.76

U - Proportion of married women using contraception C = 1 - 1.02*U
Fn = F/C F = Total Fertility Rate Fw = Wanted Fertility
Ip = (Fn-F)/(Fn-Fw)
Ip - Index of preference implementation

The trend in actual, natural and wanted fertility as well as the index of preference implementation over the three survey years in the total sample of currently married women is also observed in the rural and urban areas and Ip is lower in the rural compared to the urban area. The general pattern of actual fertility and its three determinants is also found among the education categories except that at the tertiary level of education, Ip declined over time (0.97, 0.96 and 0.91 in 1990, 1999 and 2003 respectively). Although there is a decline in the extent to which people have been able to implement their fertility preferences over the years in the tertiary education category, they are still higher than what is obtained in the other three education categories in the three surveys. The index generally increases as the level of education increases implying that people are more able

to achieve their fertility preferences as their level of education increases. For region, same general pattern as in the total sample is followed by actual fertility and its three determinants except in the South West where the extent to which respondents have been able to implement their fertility preferences remained stable (0.82 in 1990 and 0.81 in 2003). Among the regions, the extent to which people have been able to implement their fertility preferences is lowest in the North East especially in 1990.

6.3.1.2. Percentage change in the three determinants between periods

This was done to know the magnitude of the change in these determinants of fertility between periods. It is shown in Table 6.3.1.2 that wanted fertility declined in the total sample of currently married women and in the various sub groups between 1990 and 1999 except among respondents with secondary level of education where it increased from 4.27 in 1990 to 4.52 in 1999.

Table 6.3.1.2. Percentage change in wanted fertility (Fw), natural fertility (Fn) and the index of preference implementation (Ip) between 1990 & 1999; 1999 & 2003 and 1990 & 2003.

1990-1999

	Fw			Fn			Ip		
RESIDENCE	**1990**	**1999**	**% change**	**1990**	**1999**	**% change**	**1990**	**1999**	**% change**
Urban	5.18	4.44	-16.67	6.51	5.92	-9.97	0.81	0.91	10.99
Rural	6.77	5.63	-20.25	7.20	6.53	-10.26	0.58	0.87	33.33
EDUCATION									
None	7.30	6.85	-6.57	7.67	7.38	-3.93	0.57	0.83	31.33
Primary	6.49	5.53	-17.36	7.74	7.13	-8.56	0.74	0.89	16.85
Secondary	4.27	4.52	5.53	6.08	6.46	5.88	0.79	0.90	12.22
Tertiary	2.50	2.31	-8.23	4.27	4.30	0.70	0.97	0.96	-1.04
REGION									
North East	6.68	6.61	-1.06	6.96	6.98	0.29	0.46	0.73	36.99
North West	7.77	5.73	-35.60	8.03	6.47	-24.11	0.73	0.88	17.05
South East	5.76	4.45	-29.44	6.71	6.21	-8.05	0.69	0.91	24.18
South West	5.19	4.37	-18.76	6.70	6.15	-8.94	0.82	0.93	11.83
TOTAL	6.11	5.25	-16.38	6.88	6.34	-8.52	0.73	0.89	17.98

1999-2003

	Fw			Fn			Ip		
RESIDENCE	**1999**	**2003**	**% change**	**1999**	**2003**	**% change**	**1999**	**2003**	**% change**
Urban	4.44	4.84	8.26	5.92	6.35	6.77	0.91	0.83	-9.64
Rural	5.63	6.00	6.17	6.53	6.99	6.58	0.87	0.69	-26.09
EDUCATION									
None	6.85	7.44	7.93	7.38	8.03	8.09	0.83	0.64	-29.69
Primary	5.53	5.94	6.90	7.13	7.64	6.68	0.89	0.75	-18.67
Secondary	4.52	4.13	-9.44	6.46	6.11	-5.73	0.90	0.85	-5.88
Tertiary	2.31	2.64	12.50	4.30	4.24	-1.42	0.96	0.91	-5.49
REGION									
North East	6.61	7.09	6.77	6.98	7.61	8.28	0.73	0.61	-19.67
North West	5.73	6.48	11.57	6.47	7.14	9.38	0.88	0.77	-14.29
South East	4.45	4.12	-8.01	6.21	5.85	-6.15	0.91	0.75	-21.33
South West	4.37	3.86	-13.21	6.15	6.19	0.65	0.93	0.81	-14.81
TOTAL	5.25	5.53	5.06	6.34	6.72	5.65	0.89	0.76	-17.11

1990-2003

	Fw			Fn			Ip		
RESIDENCE	**1990**	**2003**	**% change**	**1990**	**2003**	**% change**	**1990**	**2003**	**% change**
Urban	5.18	4.84	-7.02	6.51	6.35	-2.52	0.81	0.83	2.41
Rural	6.77	6.00	-12.83	7.20	6.99	-3.00	0.58	0.69	15.94
EDUCATION									
None	7.30	7.44	1.88	7.67	8.03	4.48	0.57	0.64	10.94
Primary	6.49	5.94	-9.26	7.74	7.64	-1.31	0.74	0.75	1.33
Secondary	4.27	4.13	-3.39	6.08	6.11	0.49	0.79	0.85	7.06
Tertiary	2.50	2.64	5.30	4.27	4.24	-0.71	0.97	0.91	-6.59
REGION									
North East	6.68	7.09	5.78	6.96	7.61	8.54	0.46	0.61	24.59
North West	7.77	6.48	-19.91	8.03	7.14	-12.46	0.73	0.77	5.19
South East	5.76	4.12	-39.81	6.71	5.85	-14.70	0.69	0.75	8.00
South West	5.19	3.86	-34.46	6.70	6.19	-8.24	0.82	0.81	-1.23
TOTAL	6.11	5.53	-10.49	6.88	6.72	-2.38	0.73	0.76	3.95

The percentage decline in wanted fertility is higher in rural area compared to the urban, highest among respondents with primary level of education compared to the other education categories and quite substantial for respondents from the North West and South East. There is also a general decline in natural fertility between the two periods except

among respondents with secondary and tertiary levels of education as well as those from the North East. Percentage decline in natural fertility is higher in the rural compared to the urban and highest in the North West among the regions. The extent to which people are able to implement their fertility preferences increased between the periods except among respondents with tertiary level of education where it remained stable (0.97 and 0.96 in 1990 and 1999 respectively). The percentage change in the extent to which people are able to implement their fertility preferences between the periods is high in the rural area, among respondents with no education, those from the North East and among those from the South East.

Between 1999 and 2003, wanted fertility increased between the periods in the total sample and the sub groups except among respondents with secondary level of education and those from the South East and South West. Percentage change is higher in the urban, highest at the tertiary level of education and among respondents from the South West (negative i.e. decline in wanted fertility between the periods as opposed to the general increase observed between the periods). Natural fertility equally increased between the periods except in the South East and among respondents with secondary and tertiary levels of education although the percentage change here is less than ten in both ways. The increase in wanted and natural fertility could be due to the omission of births in the 1999 dataset. This reduces the numerator in the calculation of wanted fertility and that of actual fertility, which is a component part in the calculation of natural fertility. The extent to which people are able to implement their fertility preferences on the other hand declined in the total sample and in all the sub groups. The percentage decrease is higher in the

rural area, among respondent with less than secondary level of education and among respondents from the North East and South East.

Percentage change in wanted fertility between 1990 and 2003 is generally negative (i.e. decline between the periods) except among respondents with tertiary level of education and those from the North East where there is an increase between the periods. Percentage change in wanted fertility is higher in the rural and quite high in the South East and South West. Percentage change in natural fertility between 1990 and 2003 is also generally negative. The highest changes are in the regional categories but with a positive change in the North East (i.e. increase in natural fertility between the periods in the North East). Fertility preference implementation index increased between the periods except among respondents with tertiary level of education and those from the South West. Percentage change is higher among the rural respondents, highest among those with no education in the education categories and highest for respondents from the North East at the regional levels.

6.3.1.3. Estimation of the contribution of the three determinants to fertility changes between periods.

In order to estimate the contribution of wanted fertility, natural fertility and the degree of fertility preference implementation to fertility changes between the periods (1990-2003), attempt was made to decompose fertility trends into its determinants. The estimates of observed, wanted and natural fertility, as well as the index of implementation for the two successive points of 1990-1999; 1999-2003 and 1990-2003 are used in the procedure.

The decline in fertility between two periods is simply equal to $F_1 - F_2$, and this difference can be expressed as a function of the mediating variables thus:

$$F_1 - F_2 = [F_{w1}I_{p1} + F_{n1}(1 - I_{p1})] - [F_{w2}I_{p2} + F_{n2}(1 - I_{p2})] \quad (3)$$

Since the emphasis here is on examining changes in fertility that result from changes in determinants, this equation can be rewritten as

$$\Delta F = \Delta F_w \bar{I}_p + \Delta I_p (\bar{F}_w - \bar{F}_n) + \Delta F_n (1 - \bar{I}_p) \quad (4)$$

where ΔF, ΔF_w, ΔF_n and ΔI_p represent absolute changes in F, F_w, F_n and I_p respectively

and $\bar{F}_w$, $\bar{F}_n$, and $\bar{I}_p$ are the average values of F_w, F_n and I_p respectively.

Equation (4) conveniently divides the observed fertility decline ΔF into three components corresponding to each of the three determinants

Change in	**Contribution to fertility decline ΔF**
Natural fertility ΔF_n	$\Delta F_n (1 - \bar{I}_p)$
Wanted fertility ΔF_w	$\Delta F_w \times \bar{I}_p$
Index of implementation ΔI_p	$\Delta I_p (\bar{F}_w - \bar{F}_n)$

The above shows that contribution of a change in wanted or natural fertility to the observed fertility decline depends on the average level of implementation index. Similarly, the fertility effect from a given change in the index of implementation depends on the average between natural and wanted fertility. Table 6.3.1.3 shows the absolute and percentage contribution of the three determinants to changes in fertility between periods.

Table 6.3.1.3. Absolute and percentage contribution of Fw, Fn and Ip to fertility decline between 1990 & 1999; 1999 & 2003 and 1990 & 2003.

	Contribution to fertility decline						
	1990-1999						
		Absolute			Percentage		
RESIDENCE	F	Fw	Fn	Ip	Fw	Fn	Ip
Urban	0.86	0.64	0.08	0.14	74.04	9.61	16.35
Rural	1.20	0.83	0.18	0.19	68.67	15.31	16.02
EDUCATION							
None	0.52	0.32	0.09	0.12	60.69	16.76	22.54
Primary	1.11	0.78	0.11	0.21	70.55	10.18	19.27
Secondary	-0.06	-0.21	-0.06	0.21	330.59	92.18	-322.77
Tertiary	0.16	0.18	0.00	-0.02	112.14	-0.64	-11.50
REGION							
North East	0.12	0.04	-0.01	0.09	34.34	-6.68	72.34
North West	2.02	1.64	0.30	0.08	81.24	15.05	3.71
South East	1.45	1.05	0.10	0.30	72.47	6.92	20.61
South West	0.97	0.72	0.07	0.18	74.18	7.11	18.71
TOTAL	0.95	0.70	0.10	0.15	73.48	10.82	15.70
			1999-2003				
RESIDENCE							
Urban	-0.52	-0.35	-0.06	-0.12	66.48	10.68	22.85
Rural	-0.56	-0.29	-0.10	-0.17	51.54	18.07	30.38
EDUCATION							
None	-0.71	-0.43	-0.17	-0.11	60.88	24.18	14.94
Primary	-0.66	-0.34	-0.09	-0.23	51.02	13.93	35.05
Secondary	0.29	0.34	0.04	-0.10	118.90	15.24	-34.15
Tertiary	-0.39	-0.31	0.00	-0.09	78.23	-0.99	22.76
REGION							
North East	-0.58	-0.32	-0.21	-0.05	55.17	35.67	9.16
North West	-0.81	-0.62	-0.12	-0.08	76.11	14.42	9.47
South East	0.06	0.27	0.06	-0.28	489.98	109.48	-499.46
South West	0.19	0.44	-0.01	-0.25	231.21	-2.71	-128.50
TOTAL	-0.45	-0.23	-0.07	-0.15	51.83	14.92	33.25
			1990-2003				
RESIDENCE							
Urban	0.34	0.28	0.03	0.03	82.98	8.57	8.45
Rural	0.64	0.49	0.08	0.08	75.96	11.91	12.13
EDUCATION							
None	-0.19	-0.08	-0.14	0.03	43.82	73.56	-17.38
Primary	0.45	0.41	0.03	0.01	91.06	5.67	3.28
Secondary	0.22	0.11	-0.01	0.11	51.46	-2.42	50.96
Tertiary	-0.23	-0.13	0.00	-0.10	56.99	-0.78	43.79
REGION							
North East	-0.46	-0.22	-0.30	0.06	47.52	65.48	-13.00

North West	1.21	0.97	0.22	0.02	80.06	18.41	1.52
South East	1.50	1.18	0.24	0.08	78.62	16.03	5.35
South West	1.16	1.08	0.09	-0.02	93.52	8.14	-1.66
TOTAL	0.50	0.43	0.04	0.03	86.02	8.12	5.85

Fertility declined by 0.95 births per woman between 1990 and 1999. Of this decline, wanted fertility accounted for 0.70 births (which accounts for 73.5% of the decline), natural fertility accounted for 0.10 births (10.8%) while increase in the index of fertility implementation accounted for 0.15 births (15.7%) between the periods. Although the three indices contributed positively to the observed change (decline) in fertility between the periods, there is wide variation among the sub groups with the index of fertility implementation contributing a low of –322.77% (due to the observed increase in actual fertility in this group of women between the periods) among respondents with secondary level of education to a high of 72.34% among respondents from the North East.

Between 1999 and 2003, there is an increase in the observed total fertility rate (TFR) by 0.45 births per woman. Wanted fertility, natural fertility and the index of preference implementation all contributed to this increase. Their contributions are 52, 15 and 33 percents respectively. These percentages in the total sample however masked the variation among the sub groups. The three indices contributed to the observed increase in fertility in the sub groups in varying degrees. However there is a decline in the total fertility rate at the secondary level of education and in the South East and South West. At the secondary level of education, there is a decline of 0.29 births per woman. Wanted fertility and natural fertility contributed positively here (i.e. declined) while index of preference implementation contributed negatively to the tune of –34% (i.e. the percentage

change declined when it is expected to increase with decline in the other indices). The same is the situation in the South East and South West where percentage contribution of the index of preference implementation is –499 and –129 percents, respectively.

Between 1990 and 2003, TFR declined by 0.5 births per woman accountable for by a decline of 0.43 births in wanted fertility, 0.04 births decline in natural fertility and 0.03 births decline in the implementation index. These births translate into contributions of 86, 8 and 6 percents (to the observed 0.5 births per woman) by wanted fertility, natural fertility and the index of fertility preference implementation, respectively. General decline in TFR is observed between the periods among the sub groups except for respondents with no education, those with tertiary level of education and those from the North East. The increase in TFR among respondents with no education was contributed to by increase in wanted and natural fertility. This is also the case among respondents from the North East. The increase in fertility among respondents with tertiary level of education is mainly contributed by increase in wanted fertility. The negative contribution of the implementation index to the observed decline among respondents from the South West (although small) is also noted.

Although the extent to which people are able to implement their fertility preferences increased between 1990 and 2003 by about 14%, the contribution of this to actual fertility decline of 0.5 births between the periods is small (about 6%). Reduction in wanted fertility is responsible for a substantial portion (86%) of the fertility change with an 8% contribution by natural fertility. The extent to which fertility preference is implemented

actually played the least role (amongst the three determinants) in the observed fertility change between 1990 and 2003.

6.3.2. INDEX OF FERTILITY PREFERENCE IMPLEMENTATION AMONG COUPLES

Only the 1999 and 2003 data sets are used in this analysis. The 2003 couple data set is readily available while the 1999 couple data set was constructed from the 1999 women and men data sets. The men were not interviewed in 1990, hence a couple set could not be constructed for that year.

Since all the parameters factored into the derivation of the index of fertility preference implementation are women based, this study examines the fertility preference implementation indices among different categories of couples in an attempt to highlight the important role of the males in fertility decision-making and outcome. These categories are concordant couples (husbands and wives with same desired number of children), discordant couples (joint) representing the total sample of husbands and wives with dissimilar desired number of children, discordant couples (H>W) where husbands' desired number of children is more than the wife's and discordant (W>H) where wife's desired number of children is greater than the husband's. Other categories are: type of marriage (Monogamous/polygamous) and status of marriage (formal/cohabiting).

6.3.2.1. Estimation of the index of fertility preference implementation among couples

Table 6.3.2.1. Indices of fertility implementation among couples with values used in its derivation

	U	C	F	Fn	Fw	Ip
IDEAL NUMBER						
Concordant						
1999	0.147	0.850	7.69	9.05	7.57	0.92
2003	0.091	0.907	8.16	8.99	8.03	0.87
Disc (joint)						
1999	0.174	0.823	7.14	8.68	7.04	0.94
2003	0.127	0.870	7.85	9.02	7.53	0.78
Disc (H>W)						
1999	0.186	0.810	7.09	8.75	6.95	0.92
2003	0.114	0.884	7.54	8.53	7.17	0.73
Disc (W>H)						
1999	0.154	0.843	7.26	8.61	7.23	0.98
2003	0.148	0.849	8.32	9.80	8.09	0.87
TYPE OF UNION						
Monogamous						
1999	0.179	0.817	7.46	9.13	7.37	0.95
2003	0.141	0.856	8.03	9.38	7.72	0.81
Polygamous						
1999	0.099	0.899	7.28	8.10	7.16	0.87
2003	0.054	0.945	7.75	8.20	7.64	0.80
STATUS OF UNION						
Formal						
1999	0.155	0.842	6.06	7.20	5.96	0.92
2003	0.104	0.894	7.99	8.94	7.78	0.82
Cohabiting						
1999	0.247	0.748	7.85	10.49	7.75	0.96
2003	0.37	0.623	8.87	14.25	7.98	0.86
TOTAL						
1999	0.162	0.835	7.39	8.85	7.29	0.94
2003	0.11	0.888	7.99	9.00	7.76	0.81

As can be deduced from Table 6.3.2.1 above, total fertility rate, natural fertility and wanted fertility increased between 1999 and 2003 in the total sample of couples while the extent to which people are able to implement their fertility preferences declined between the periods. This pattern of the result could be due to the omission of births in the 1999

survey. Among concordant couples, the pattern of the determinants is the same as seen in the total sample of couples except that natural fertility declined instead between the periods. For the (joint) discordant couples, the general pattern of increase in actual, wanted and natural fertility and decline in the index of preference implementation is observed.

Among discordant couples where the husbands desire more children than the wives, there is a decline in natural fertility while the pattern for discordant couples where the wives desire more children than the husbands is as observed in the joint discordant couples. For monogamously, polygamously, formally married and cohabiting couples, pattern of actual, wanted and natural fertility as well as the extent of achievement of fertility preference is as found in the total sample of couples.

The total sample of discordant couples was able to implement their fertility preferences (higher index of preference implementation) better in 1999 when compared to the concordant ones while the opposite is the case in 2003. When the total sample of discordant couples is disaggregated, index of preference implementation is higher among couples where the wives desire more children and are thus able to implement their fertility preferences better than concordant ones in 1999, but both classes of couples are at the same level in 2003. The index of fertility preference implementation is equally higher among couples where the husband desire more children compared to the concordant couples in 1999 but lower than the concordant couples' in 2003.

In both survey years, discordant couples where the wives desire more children are able to implement their fertility preferences better than those couples where the husbands desire more. Monogamously married couples are also able to implement their preferences better than the polygamously married ones in both years. Likewise, the index is higher among cohabiting couples compared to the formally married ones in both survey years.

6.3.2.2. Percentage change in the three determinants between 1999 and 2003.

Table 6.3.2.2. Percentage change in Fw, Fn and Ip between 1999 & 2003.

	Fw			Fn			Ip		
IDEAL	1999	2003	% change	1999	2003	% change	1999	2003	% change
Concordant	7.57	8.03	5.73	9.05	8.99	-0.67	0.92	0.87	-5.75
Disc (joint)	7.04	7.53	6.51	8.68	9.02	3.77	0.94	0.78	-20.51
Disc (H>W)	6.95	7.17	3.07	8.75	8.53	-2.58	0.92	0.73	-26.03
Disc (W>H)	7.23	8.09	10.63	8.61	9.80	12.14	0.98	0.87	-12.64
Monogamous	7.37	7.72	4.53	9.13	9.38	2.67	0.95	0.81	-17.28
Polygamous	7.16	7.64	6.28	8.10	8.20	1.22	0.87	0.8	-8.75
Formal	5.96	7.78	23.39	7.20	8.94	19.46	0.92	0.82	-12.20
Cohabiting	7.75	7.98	2.88	10.49	14.25	26.39	0.96	0.86	-11.63
TOTAL	7.29	7.76	6.06	8.85	9.00	1.67	0.94	0.81	-16.05

The observed increase in wanted and natural fertility in the total sample of couples between 1999 and 2003 translated into a 6% and 2% increase respectively while the decline in extent to which couples have been implementing their fertility preferences amounted to a 16% change. The percentage increase in wanted fertility in the sub groups ranged from 2.88% among cohabiting couples to 23.39% among those that are formally married. While the lowest percentage change in wanted fertility is found among the cohabiting couples, the highest percentage change in natural fertility is found among them. For the index of fertility preference implementation, the highest percentage change

is found among the discordant couples and the least among the concordants (couples with similar desired number of children).

6.3.2.3. Contribution of the three determinants to fertility change between 1999 and 2003.

Table 6.3.2.3. Absolute and percentage contribution of Fw, Fn and Ip to fertility decline between 1999 & 2003.

		Absolute			Percentage		
IDEAL	F	Fw	Fn	Ip	Fw	Fn	Ip
Concordant	-0.47	-0.41	0.01	-0.06	88.27	-1.35	13.08
Disc (joint)	-0.72	-0.42	-0.05	-0.25	58.58	6.62	34.81
Disc (H>W)	-0.44	-0.18	0.04	-0.30	40.95	-8.69	67.73
Disc (W>H)	-1.05	-0.80	-0.09	-0.17	75.42	8.46	16.11
Monogamous	-0.58	-0.31	-0.03	-0.24	53.34	5.20	41.46
Polygamous	-0.47	-0.40	-0.02	-0.05	85.31	3.51	11.17
Formal	-1.93	-1.58	-0.23	-0.12	82.06	11.72	6.22
Cohabiting	-1.00	-0.21	-0.34	-0.45	20.97	33.90	45.13
TOTAL	-0.61	-0.41	-0.02	-0.18	67.20	3.06	29.74

In the total sample of couples, fertility increased by 0.6 births per woman between 1999 and 2003. The three fertility determinants: wanted fertility, natural fertility and the index of preference implementation (the extent to which couples have been able to implement their fertility preferences) contributed 67%, 3% and 30% respectively to this increase. Wanted fertility contributed most among concordant couples, the total sample of discordant couples; discordant couples where the wives desire more children than the husbands as well as among polygamously and formally married couples. The index of preference implementation contributed most among couples where the husbands desire more children than the wives and among cohabiting couples. Its contribution in the total sample of discordant couples is also substantial. The contribution of natural fertility to

observed fertility change between the periods is also prominent among cohabiting couples (34%), a category where wanted fertility plays the least role at 12%.

The index of preference implementation declined from 0.94 in 1999 to 0.81 by 2003. This percentage change is sixteen and is much higher than that observed in the changes of the other two determinants. The index however contributed about 30% (next to wanted fertility, which contributed 67%) to the observed increase in actual fertility between the periods. This implies that the extent to which couples are able to achieve their fertility preferences actually declined between 1999 and 2003. A principal reason for this will still be the omission of births in the 1999 survey.

6.4. DISCUSSION

The mean number of children desired by the total sample of women has been increasing over time although, this trend could have been affected by the high percentage of non-numeric response in the 1990 survey. The desired number of children is positively related to age and number of surviving children (i.e. increases as age and number of surviving children increases) while it is negatively related to education (reduces with increase in the level of education). Number of children desired is found to be lower among urban residents and respondents from the Southern part of the country and highest among currently married women.

Analysis of reproductive intention by whether currently married women wants a/another child within two years, after two years or not any more shows that in the total sample of

women, the percentage of those that want to have a/another child within two years and those that were declared infecund declined between 1990 and 2003 while the reverse is the case for those that want to postpone birth until after two years and those that want no more. Urban-rural analysis shows that respondents that want to have a/another child within two years and those declared infecund are more in the rural while there are more respondents who want no more children in the urban area. Not much difference between the rural and urban areas is observed in the percentage of those that want a/another child after two years.

Percentage of respondents that want no more children is higher in the South compared to the North while the percentage of those declared infecund is higher in the North when compared to the South in all the survey years. Percentage of respondents that want a/another child generally declines as number of surviving children increases in all the years. The situation is the same for those that want another after two years except when number of surviving children is less than two. Respondents that want no more children increase as number of surviving children increases (except for those that have no surviving child in 2003). These results are similar to those in the NDHS 1990, 1999 and 2003 reports. The slight differences are because only valid percentages are used here (i.e. missing cases were excluded in this analysis). The high percentage of women who want another child (within two years and after two years) among those who already have four or more surviving children is worthy of note. Also noteworthy is the high percentage (relative to the other categories in the group) of women in the rural area and the North that are declared infecund. Adegbola (1987) also found high incidence of sterility in

women who have traditional characteristics (including living in the rural areas) and those in the Northern regions.

The extent, to which fertility preference is achieved, has been increasing over the years in the total sample of married women with some variations in the sub groups. It is higher in the urban compared to the rural; increases with level of education, lowest in the North East and highest in the South West. The high value of the index is mainly due to the little difference that exists between wanted and actual fertility among respondents in such subgroups.

Wanted fertility generally declined between 1990 and 2003 except among respondents with no education, those with tertiary level of education and those from the North East where there were increases between the periods. This also affected their percentage changes when compared with other categories within the groups. Percentage change in wanted fertility is higher in the rural and quite high in the South East and South West. This is an indicator that in absolute terms, the reduction of wanted fertility between the periods is higher in the rural and the South. Percentage change in natural fertility between 1990 and 2003 is also generally negative, implying reduction in natural fertility between the periods. The highest changes are in the regional categories but with an increase in the North East.

The extent to which fertility preference is implemented increased between the periods except among respondents with tertiary level of education and those from the South

West. Percentage change is higher among the rural respondents, highest among those with no education in the education categories and highest for respondents from the North East at the regional levels. The higher index of fertility preference implementation among the rural respondents is consistent with the higher decline in their wanted fertility (compared to respondents from the urban), which translated to a great reduction in the difference between actual and wanted fertility by the end of the periods examined (2003). For respondents with no education and those from the North East however, the high fertility preference implementation is due to increase in their wanted fertility, which led to the closing up of the gap that existed between actual and wanted fertility by the end of the period.

It is also worthy to note that where an index is initially high compared to the others in the group, it has more potential to decline faster than the others (as there is always a steep decline at the initial stage of any transition, before a slowing down and eventual stall), and this magnifies the percentage change observed in such category relative to the others. This is so for wanted fertility in the rural-urban as well as along the education categories in this study.

Between 1990 and 2003, total fertility rates (TFR) declined by 0.5 births per woman accountable for by a decline of 0.43 births in wanted fertility, 0.04 births decline in natural fertility and 0.03 births decline in the implementation index. These births translate into 86%, 8% and 6% contribution (to the observed 0.5 births per woman) by wanted fertility, natural fertility and the index of fertility preference implementation,

respectively. General decline in TFR is also observed between the periods among the sub groups except for respondents with no education, those with tertiary level of education and those from the North East. The increase in TFR among respondents with no education and those from the North East was contributed to by increase in wanted and natural fertility while increase in wanted fertility was responsible mainly for those with tertiary level of education.

Although the extent to which people are able to implement their fertility preferences increased between 1990 and 2003 by about 14%, the contribution of this to actual fertility decline of 0.5 births between the periods is small (about 6%). Reduction in wanted fertility is responsible for a substantial portion (86%) of the fertility change with an 8% contribution by natural fertility. The extent to which fertility preference is implemented actually played the least role (amongst the three determinants) in the observed fertility change between 1990 and 2003. The results of this study are consistent with those found by Bongaarts (1993); Ibisomi (2002) and Ibisomi, Odimegwu, Otieno and Kimani (2005) for the country although at the aggregate level (developing countries altogether), fertility preference implementation is a more important determinant of fertility decline than wanted fertility.

It is also worthy to note that although actual and wanted fertility declined between 1990 and 2003, unwanted fertility increased from 0.21 in 1990 to 0.29 births per woman by 2003. This increase was however not great enough to destabilise the resultant increase in

the extent to which fertility preferences are implemented (from the interplay between natural, actual and wanted fertility).

Since all the parameters factored into the derivation of the implementation index are women based, this study attempted to tease out the influence of the males on eventual fertility outcome by examining the fertility preference implementation indices among different categories of couples. The results are similar to that found in the total sample of women in section 6.3.1 above. The extent to which the total sample of couples has been able to implement their fertility preferences declined generally between 1999 and 2003. This should however be taken with caution, as the 1999 fertility estimates are lower than they should be as a result of omission of births in the survey. The same explanation goes for the total sample of women. It should also be noted that this is an aggregate analysis and the achievement of fertility preference could be either way (under achieve or over achieve).

The pattern among the different categories of couples shows that index of fertility preference implementation is higher among cohabiting couples compared to the formally married ones; higher among monogamously married couples compared to the polygamously married ones; higher among discordant couples where the wives desire more children than the husbands compared to where the husbands desire more than the wives and also compared to concordant couples. The polygamously married women may be limited in the implementation of their fertility preferences either by not getting enough attention from the man to have the number that they desired or by having more than they

actually desired to enable them compete with their co-wives. The higher preference implementation among discordant couples compared to the concordant ones is surprising and raises the question of whether agreement between couples implies equal inputs. Also for the formally married couples, the achievement of the women could have been greatly influenced by their husbands whereas for the cohabiting couples, the influence of the man on the woman will not be so strong as the relationship itself is not firm.

A pointer to the influence of the males on fertility preference achievement by the wives is that of discordant couples where the husbands desired more children than the wives. Results show that the extent to which the fertility preferences of these women are achieved is less than that of the women who desired more children than their husbands. For the first group of women, it could be that they had to adjust their preferences upward to meet the husbands' demand (thereby decreasing the extent of achieving their individual preferences) while the latter group could have used their influence as the people directly in charge of reproduction to achieve their ends. Looking at it from these points of view, both partners are influential in fertility preference implementation.

Another approach will be used in the next chapter to further investigate the role of the male in fertility decision-making and outcome. This involves fitting logistic regression models of spousal influence on each other's family planning attitude and desired number of children (as proxies for fertility decision making between couples) to examine, which of the spouses have upper hand on the other on such matters.

CHAPTER 7

SPOUSAL INFLUENCES OVER EACH OTHER'S ATTITUDE TO FAMILY PLANNING AND FERTILITY DESIRE.

7.0. INTRODUCTION

In the derivation of fertility estimates and measurements as well as in most fertility analysis, only 'women factors' are traditionally imputed. Whereas, both sexes play vital roles in fertility outcome. In recognition of this, fertility and family planning programs and researches are now expanding to include men's attitude and preferences and the role they play in fertility decision-making. Examples of such efforts are studies carried out by Isiugo-Abanihe (1994); Bankole (1995); Bankole and Singh (1998); Derose, Nii-Amoo Dodoo and Patil (2002). An examination of spousal influences over each other's reproductive attitude, desire and behaviour is therefore important. This is particularly so in this study area, which is a male dominated society. Most ethnic groups in Nigeria exhibit strong patriarchal systems that confer on men decision-making roles in matters affecting the family and the society. Nigerian men also place a high premium on children, which has had a profound influence on fertility outcomes (Abanihe, 1994).

In this study, the effects the couple's individual characteristics and their shared characteristics have on their attitude to fertility regulation (measured by attitude to use of family planning method) and fertility preference (measured by desired number of children) is examined. This is to find out which of the spouses have more influence on the other. The 1999 (constructed) and 2003 Nigeria Demographic and Health Survey

(NDHS) couples data set are used. Twelve binary and twelve multinomial logistic regression models are fitted to tease out these influences.

Three models are fitted for each subset of dependent variable by the respondent (husbands/wives) examined. In model 1, only the husbands or wives individual characteristics are used. In model 2, the shared characteristics of the couples are examined controlling for the individual characteristics while model 3 examines the influence of the spouse characteristics controlling for his/her individual characteristics as well as his/her shared characteristics with the spouse. The three models are stated as follows:

$Y_1 = a + b_iX_i + e_i$ ..... Model 1

$Y_2 = a + b_iX_i + c_iG_i + e_i$ ..... Model 2

$Y_3 = a + b_iX_i + c_iG_i + d_iH_i + e_i$ ..... Model 3

where

Y_1, Y_2 and Y_3 represent the family planning attitudes or desired number of children by the husbands or wives (outcome variables for models 1, 2 and 3 respectively).

a are constants

b_i represents the effects of the individual characteristics of the husbands or wives on the husbands' or wives' family planning attitudes or desired number of children (outcome variable)

c_i represents the effects of the couple's shared characteristics on the outcome variable

d_i represents the effects of the individual characteristics of the spouses of the husbands or wives on the outcome variable

X_i represents the husbands or wives individual characteristics

G_i represents the couple's shared characteristics

H_i represents the individual characteristics of the spouses to the husbands or wives.

e_i is the random error term, which represents unobserved characteristics of the husbands or wives on the outcome variable.

Some variables that should have influence on the outcome variables are obviously missing in the models. For example, duration of marriage and couple's age difference. These two were dropped from this analysis because they are highly correlated with the ages of the husbands as well as the wives. When included in the models, they displace each other or the spouse's age that is entered in model 3. Inclusion of highly correlated explanatory variables in a model could cause problems in fitting and interpreting regression models. For instance, it can give the impression that neither is associated with the outcome even when each exposure is strongly associated (individually) with the outcome. (Kirkwood and Sterne, 2003).

The age variables of the husbands and wives are log transformed before being used in analysis. This is because their effect on the outcome variables could be different at the different ages (i.e. when age is not linear).

As a prelude to examining the spousal influence over each other's attitude and desire, an examination of the couples' characteristics is first carried out.

7.1. DISTRIBUTION OF THE HUSBANDS AND WIVES BY SOME OF THEIR CHARACTERISTICS.

Table 7.1a below shows that husbands are about ten years older than their wives in the two surveys. About 65% and 63% of the husbands in 1999 and 2003 respectively had some level of education while the percentages are 49 and 47 respectively for the women in the two surveys. The husbands in the 1999 survey on the average have about 1.3 children more than their wives while those in the 2003 survey have about 1.7 children more.

More wives (55.5%) than husbands (50.5%) disapproved family planning in 1999 while the opposite was the case in 2003. Although, there was not much difference between the husbands and the wives in 2003, the percentages of those that approved are less than those that disapproved. About 15% of husbands and wives (19% for wives in 1999) have a desired number of children of four or below. Less than 6% of husbands and wives in 1999 have a desired number of children that is three and below and this declined to about 4% by 2003. More wives than husbands have a desired number of children that is six or more while non-numeric responses are more common among the husbands (see Table 7.1a for further details).

Table 7.1a. Percentage Distribution of Some Individual Characteristics of Husbands and Wives, NDHS 1999 and 2003.

Variables	1999		2003	
	Husbands	**Wives**	**Husbands**	**Wives**
Age				
15-19	0.6	7.7	0.3	11.6
20-24	2.5	15.5	3.5	16.4
25-29	11.3	24.5	9.8	23.6
30-34	17.5	19.5	18.0	16.0
35-39	16.7	14.9	16.0	15.9
40-44	14.8	10.7	17.5	10.1
45-49	12.9	7.1	14.2	6.3
50-54	12.9	-	10.9	-
55-59	6.2	-	9.8	-
60-64	4.6	-	-	-
Mean age	40.15	30.34	39.90	29.79
Number of valid Observations	1280	1280	1168	1168
Education				
None	35.1	51.0	37.1	53.4
Primary	29.1	22.4	29.2	23.1
Secondary	22.6	21.1	22.6	19.7
Tertiary	13.3	5.5	11.1	3.8
Number of valid Observations	1280	1280	1168	1168
Mean number of surviving Children	4.68	3.35	4.86	3.16
Number of valid Observation	1280	1280	1168	1168
Family planning approval				
Disapprove	50.5	55.5	56.3	54.6
Approve	49.5	44.5	43.8	45.4
Number of valid Observations	1280	1280	1168	1168
Desired number of Children				
0	0.1	0.2	0.1	-
1	0.1	0.3	0.1	-
2	0.8	1.3	0.4	1.0
3	4.1	4.1	3.2	2.8
4	9.5	13.1	10.7	10.5
5	9.5	12.3	10.2	11.8
6+	47.3	48.2	51.3	59.2
Non-numeric response	28.8	20.4	24.1	14.6
Number of valid Observations	1280	1280	1168	1168

Table 7.1b. shows that the mean age difference between couples is about ten years in the sample of couples in the two surveys. Close to 70% of the couples reside in rural areas.

While about 55% of the couples are from the North in 1999, the percentage is about 70% in 2003. About 30% of the couples have no formal education in the two survey years; about a quarter have same level of education; over 30% of the husbands are more educated than their wives while only about 10% of the wives have more education than their husbands.

Ninety-two and ninety-eight percents in 1999 and 2003 respectively of the couples are in a formal union and about 77% and 65% of this union are monogamous in the two years, respectively. Close to two-fifths of the couples disapproved family planning, about 30% approve and more husbands than wives (of about 30% of the couples) approve family planning.

Table 7.1b. Percentage Distribution of Spouses' Joint Characteristics, NDHS 1999 and 2003.

Variables	1999	2003
Mean age difference	9.82	10.11
Number of valid Observations	1280	1168
Residence		
Urban	31.3	33.6
Rural	68.6	66.4
Number of valid Observations	1280	1168
Region		
North East	28.7	42.0
North West	27.7	27.7
South East	20.0	16.2
South West	23.7	14.2
Number of valid Observations	1280	1168
Education		
Both no education	31.6	32.4
Both primary	12.0	10.2
Both secondary	9.9	9.3
Both tertiary	4.4	2.7
Husband more education	32.3	34.5
Wife more education	9.8	11.0
Number of valid Observations	1280	1168

Status of Union		
Formal	92.4	97.7
Consensual	7.6	2.3
Number of valid Observations	1280	1168
Type of Union		
Monogamous	78.6	64.7
Polygamous	21.4	35.3
Number of valid Observations	1280	1165
Number of surviving Children		
Both reported same	53.5	48.7
Husband reported more	38.9	46.2
Wife reported more	7.6	5.1
Number of valid Observations	1280	1168
Desire number of Children		
Both reported same	44.2	46.9
Husband reported more	34.5	31.7
Wife reported more	21.3	21.4
Number of valid Observations	1280	1168
Family planning approval		
Both disapprove	36.8	37.4
Both approve	33.1	29.0
Only Husband approves	18.8	17.2
Only Wife approves	11.3	16.4
Number of valid Observations	1280	1168

7.2. EFFECT OF COUPLES CHARACTERISTICS ON THEIR DESIRED NUMBER OF CHILDREN.

The dependent variable here is desired number of children and the question and responses that gave rise to it have been discussed extensively in section 6.1 of chapter 6. The dependent variable is coded 3 if the respondent's desired number of children is less or equal to four, 2 if the respondent gave non-numeric response and 1 if the respondent desire five or more children. This grouping is in line with the implicit four-child policy in section 4.3.1.3 of the 1988 National Policy on Population for Development, Unity, Progress and Self-reliance of Nigeria. Tables 7.2a-c present the odds ratios of the multinomial logistic regression models of the husbands' and wives' desired number of

children by their individual characteristics (Model 1, Table 7.2a), their shared characteristics with their spouses (Model 2, Table 7.2b) and the spouses' individual characteristics (Model 3, Table 7.2c).

Table 7.2a. Odds Ratios of the Multinomial Logistic Regression of Husbands' and Wives' desired Number of Children by Their Individual Characteristics (Model 1)

	Husbands		Wives	
	1999	**2003**	**1999**	**2003**
5 and above				
Individual Characteristics				
Intercept	-0.004	4.844*	1.443	2.379
Age (ln)	0.850	0.239*	0.486	0.364*
Education:				
None	7.962*	6.352*	3.511*	7.697*
Primary	2.999*	2.080*	2.331*	3.127*
Secondary	1.761*	1.198	1.388	1.588
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children:	1.254	1.174*	1.381*	1.462
Approval of Family Planning:				
Disapproves	2.018*	4.685*	2.763*	2.706*
Approves	1.000	1.000	1.000	1.000
Non-numeric response				
Individual Characteristics				
Intercept	-2.712	4.524*	0.185	-19.046*
Age (ln)	1.188	0.144*	0.305*	0.454
Education:				
None	8.463*	9.037*	10.564*	1.0E+09*
Primary	3.447*	1.227	3.445	1.4E+08*
Secondary	1.558	0.644	1.385	4.0E+07*
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children:	1.341*	1.253*	1.498*	1.462*
Approval of Family Planning:				
Disapproves	4.058*	18.082*	7.026*	5.315*
Approves	1.000	1.000	1.000	1.000
Nagelkerke R^2	0.210	0.300	0.251	0.267

* significance; Intercepts are coefficient values.

Of the husbands that desired five or more children, only education and family planning attitude among their individual characteristics entered into the model are significant predictors of their desired number of children in 1999 while all the husbands characteristics are in the 2003 survey. The higher the level of education, the less likely the husbands' desired number of children is five or more in the two surveys. With each year increase in the age of the husbands, the odds of having a desired number of children of five or more decreases while for each additional surviving child, the odds of having a desired number of five children or more increases in both survey years. Disapproval of family planning is also more likely among husbands who desire five or more children.

For husbands that gave non-numeric responses to the question on desired number of children when compared to those that desire four or lesser number of children, the patterns are the same as husbands that desired five or more children compared to those that want four or lesser. The exceptions are that number of surviving children is a significant predictor of giving a non-numeric response in 1999 and surprisingly, in this group of respondents, those with secondary level of education are less likely than those with tertiary level of education to give non-numeric response to the question on ideal number of children. Also, in 1999, the odds of giving non-numeric response increases with each year's increase in the age of the husbands.

Regarding the wives with five or more desired number of children, education, number of surviving children and family planning attitude are significant predictors of the number of children that they desired in 1999 while age displaced surviving number of children in

2003. For the wives too, the higher their level of education, the less likely they desired five or more children and with each year increase in age, the odds of having a desired number of children of five or more decreases while the odds increases for each additional surviving child in the two surveys. Here also, disapproval of family planning is more likely among the wives who desire five or more children.

Among wives that gave non-numeric response, all their individual characteristics entered in the model are significant predictors of their desired number of children in 1999 while age is not, in the 2003 survey. The pattern of association in this group of women is as in the women that desire five or more children.

Model 2 in Table 7.2b examines the influence of the couples' shared characteristics controlling for their individual characteristics. In the first panel of column 2 of Table 7.2b, net of the husbands' individual characteristics, type of place of residence and region are significant predictors of the husbands having a desire of five or more children in 1999 while for 2003, the significant predictors are: type of place of residence, region and type of union. Husbands residing in the urban areas are less likely to have a desire for five or more children in the two survey years. Husbands from the North East and North West regions are significantly more likely to desire five or more children compared to those from the South West. Husbands that are monogamously married are found to be less likely to have a desire for five or more children compared to those that are polygamously married and this is significant in 2003.

Table 7.2b. Odds Ratios of the Multinomial Logistic Regression of Husbands' and Wives' desired Number of Children by Their Individual and Shared Characteristics Spouses (Model 2)

	Husbands		Wives	
	1999	2003	1999	2003
5 and above				
Individual Characteristics				
Intercept	-2.578	2.642	1.744	1.527
Age (ln)	1.954	0.499	0.478	0.431
Education:				
None	5.313*	3.265*	2.617*	5.860*
Primary	2.591*	2.426*	1.810	3.037*
Secondary	1.861*	1.568	1.212	1.828
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children:	1.195*	1.090	1.377*	1.460*
Approval of Family Planning:				
Disapproves	1.469	3.826*	2.747*	2.304*
Approves	1.000	1.000	1.000	1.000
Couples' Shared Characteristics				
Residence:				
Urban	0.387*	0.385*	0.856	0.973
Rural	1.000	1.000	1.000	1.000
Region:				
North East	2.120*	2.793*	1.331	1.641
North West	2.746*	3.011*	2.592*	2.069*
South East	1.630	1.098	3.274*	0.909
South West	1.000	1.000	1.000	1.000
Status of Union:				
Formal	1.073	1.728	0.933	1.643
Cohabiting	1.000	1.000	1.000	1.000
Type of Union:				
Monogamous	0.795	0.349*	0.586*	0.605*
Polygamous	1.000	1.000	1.000	1.000
Non-numeric response				
Individual Characteristics				
Intercept	-5.531*	2.208	-997	-19.710*
Age (ln)	3.161*	0.361	0.430	0.619
Education:				
None	5.353*	4.815*	7.334*	5.8E+08*
Primary	3.346*	1.848	3.404	1.1E+08*
Secondary	1.769	1.080	1.389	3.9E+07*

Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children:	1.262*	1.156*	1.476*	1.587*
Approval of Family Planning:				
Disapproves	2.775*	14.766*	5.825*	4.681*
Approves	1.000	1.000	1.000	1.000
Couples' Shared Characteristics				
Residence:				
Urban	0.441*	0.713	1.083	1.343
Rural	1.000	1.000	1.000	1.000
Region:				
North East	2.193*	9.259*	3.468*	4.126*
North West	2.880*	4.851*	2.252*	1.321
South East	0.858	0.523	1.651	0.258
South West	1.000	1.000	1.000	1.000
Status of Union:				
Formal	1.050	0.335	1.046	0.609
Cohabiting	1.000	1.000	1.000	1.000
Type of Union:				
Monogamous	0.651	0.404*	0.608	0.812
Polygamous	1.000	1.000	1.000	1.000
Nagelkerke R^2	0.256	0.405	0.322	0.337

* significance; Intercepts are coefficient values.

For husbands with non-numeric response, the pattern of the result is the same as in those that desire five or more children for the 1999 survey. In 2003, type of place of residence is not a significant predictor of giving a non-numeric response. The pattern for region and type of union however remains the same as found among those that desire five or more children.

In this model, no significant difference is found between rural and urban residents among women with five or more desired number of children although, the odds is lower in the urban compared to the rural. Wives from the North West and South East are significantly more likely in 1999 to desire five or more children than those from the South West while

only those from the North West in 2003 are significantly more likely than those from the South West. Whether the marriage is formal or consensual (cohabiting) has no significant effect among wives with five or more desired number of children. These wives that desire five or more children are however less likely in 1999 and more likely in 2003 to be in a formal union. Those that are monogamously married are also found to be significantly less likely to desire five or more children in the two surveys.

For wives with non-numeric response, only region of residence are significant predictors of their desired number of children among the couples' shared characteristics entered into the model. The wives in the North East and North West are more likely to give non-numeric response compared to those from the South West in 1999 while only those from the North East are significantly more likely to do so in the 2003 survey.

Table 7.2c. Odds Ratios of the Multinomial Logistic Regression of Husbands' and Wives' Desired Number of Children by Their Individual, Shared and Their Spouses' Characteristics (Model 3)

	Husbands		Wives	
	1999	**2003**	**1999**	**2003**
5 and above				
Individual Characteristics				
Intercept	-1.104	3.265	-0.616	2.371
Age (ln)	1.705	0.739	0.221*	0.668
Education:				
None	2.690*	1.862	2.366*	6.182*
Primary	1.719	1.843	1.68	3.141*
Secondary	1.637	1.332	1.275	1.951
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children:	1.059	0.997	1.374*	1.447*
Approval of Family Planning:				
Disapproves	1.351	3.444*	2.795*	2.193*
Approves	1.000	1.000	1.000	1.000

Couples' Shared Characteristics				
Residence:				
Urban	0.436*	0.423*	0.908	1.031
Rural	1.000	1.000	1.000	1.000
Region:				
North East	1.405	2.260*	1.254	1.377
North West	1.954*	2.065*	2.466*	1.763
South East	1.317	0.935	2.916*	0.879
South West	1.000	1.000	1.000	1.000
Status of Union:				
Formal	1.025	1.386	0.964	1.545
Cohabiting	1.000	1.000	1.000	1.000
Type of Union:				
Monogamous	0.770	0.300*	0.546*	0.662
Polygamous	1.000	1.000	1.000	1.000
Spouses' Characteristics				
Age (ln)	0.649	0.512	3.661*	0.505
Education:				
None	1.929	2.605	0.864	0.716
Primary	1.342	1.389	1.053	0.695
Secondary	0.806	1.308	0.850	0.754
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children	1.232*	1.168	0.965	1.010
Approval of Family Planning:				
Disapproves	1.459	1.545	0.995	1.408
Approves	1.000	1.000	1.000	1.000
Desired Number of Children:				
≥5	2.239*	1.534	2.432*	1.484
Non-numeric	1.217	0.436*	1.264	1.701
< 5	1.000	1.000	1.000	1.000

Non-numeric response				
Individual Characteristics				
Intercept	-3.062	1.496	-2.867	-18.092
Age (ln)	3.283	0.788	0.184*	0.601
Education:				
None	2.345	2.648	4.823*	5.5E+08*
Primary	2.013	1.429	2.590	1.1E+08*
Secondary	1.460	0.887	1.256	4.4E+07*
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children:	1.115	1.110	1.511*	1.617*
Approval of Family Planning:				
Disapproves	2.324*	13.072*	5.309*	4.415*
Approves	1.000	1.000	1.000	1.000
Couples' Shared Characteristics				
Residence:				
Urban	0.509*	0.784	1.141	1.304
Rural	1.000	1.000	1.000	1.000
Region:				
North East	1.122	6.887*	3.063*	3.469*
North West	2.031*	3.275*	1.885	1.249
South East	0.719	0.443	1.539	0.294
South West	1.000	1.000	1.000	1.000
Status of Union:				
Formal	0.955	0.270	1.078	0.579
Cohabiting	1.000	1.000	1.000	1.000
Type of Union:				
Monogamous	0.611	0.423*	0.534	0.859
Polygamous	1.000	1.000	1.000	1.000
Spouses' Characteristics				
Age (ln)	0.428	0.464	3.840*	0.738
Education:				
None	1.863	2.799	1.314	1.359
Primary	1.511	1.672	1.205	0.828
Secondary	0.723	1.637	1.115	0.882
Tertiary	1.000	1.000	1.000	1.000
Number of surviving Children	1.296*	1.014	0.935	0.999
Approval of Family Planning:				
Disapproves	2.164*	1.580	1.290	1.565
Approves	1.000	1.000	1.000	1.000

Desired Number of Children:				
≥5	1.230	1.873	1.298	0.377*
Non-numeric	1.420	0.900	1.434	0.747
< 5	1.000	1.000	1.000	1.000
Nagelkerke R^2	0.309	0.431	0.356	0.363

* significance; Intercepts are coefficient values.

Model 3 in Table 7.2c examined the effect of the spouses' individual characteristics on their husbands' or wives' desired number of children controlling for the husbands' or wives' individual characteristics as well as their shared characteristics. The first panel of column 2 of the table shows that for the husbands that desire five or more children, the wives' number of surviving children and desired number of children are significant predictors of the husbands' desired number of children in 1999 while only non-numeric response of the wives' characteristics have any significant impact on the husbands' desired number of children in 2003. Although the two wives' characteristics are only significant in 1999, for each surviving child of the wives, the odds of the husbands having a desire for five or more children increases by 1.232 and 1.168 in 1999 and 2003, respectively. Husbands whose wives have a desire for five or more children and those that gave non-numeric response are also more likely to have a desire for five or more children in the 1999 surveys.

In the second panel of column 2 of Table 7.2c, only number of surviving children and family planning attitudes of the wives are significant predictors of the husbands with non-numeric number of children in 1999 while none of the wives' characteristics is a significant predictor of the husbands' desired number of children in 2003 (in column 3). Here also (just as among husbands that desire five or more children), for each surviving child of the wives, the odds of the husbands giving a non-numeric number increases

while disapproval of family planning is more likely among wives of husbands that have non-numeric number of children.

Among wives that desire five or more children, only the husbands' age and desired number of children have significant effect in 1999 while none of the husbands' characteristics have any effect in 2003. In the 1999 survey, with each one year increase in the husbands' age, the odds of the wives having a desired number of five or more children is 3.661 that of the husbands of wives that desire four or lesser number of children. The husbands with a desired number of five or more children and those with non-numeric number are also more likely to have wives that desired five or more children.

For wives that gave non-numeric numbers of children desired, only their husbands' age is a significant predictor of their desired number of children in 1999 while only the husbands' desired number of children is significant in the 2003 survey. In the 2003 survey however, the husbands that desired five or more children and those that gave non-numeric numbers are less likely to have wives that gave non-numeric response.

Overall, the husbands' desired number of children is dependent on their individual characteristics, the shared characteristics with their wives as well as some of the wives' characteristics except among husbands that gave non-numeric number of children in the 2003 survey. For the wive' also, their desired number of children in this sample is determined by their individual characteristics, their shared characteristics with their

husbands as well as some of the husbands' individual characteristics except among the women that desired five or more children in 2003 where only their individual characteristics and their shared characteristics with their husbands hold sway.

Table 7.2d. Nagelkerke R^2 Values of the Three Models of Desired Number of Children

	1999		2003	
	Husbands	**Wives**	**Husbands**	**Wives**
Model 1	0.210	0.251	0.300	0.267
Model 2	0.256	0.322	0.405	0.337
Model 3	0.309	0.356	0.431	0.363

In determining which of the three models is the best for the outcome variable, the R^2 values (which gives the proportion of the total variation in the outcome explained by the model) are used. The R^2 values in Table 7.2d show that model 3 is the best for all these cases. Although for husbands that gave non-numeric responses and wives that desired five or more children in 2003, model 2 is sufficient as the conclusion is the same whether model three or two is used. In each of these two cases, none of the additional variables (spouses' characteristics) is a significant predictor of the outcome variable in model 3. However, since the regression jointly model respondents with five or more children and those that gave non-numeric responses, model 3 is chosen as the most parsimonious for both the husbands' and wives' desired number of children.

7.3. EFFECT OF COUPLES' CHARACTERISTICS ON THEIR FAMILY PLANNING ATTITUDE.

The dependent variable used here is approval of family planning. This is coded 1 if the respondent's answer to the question 'In general, do you approve or disapprove couples using a method to avoid pregnancy' is yes and coded 0 if the answer is no. For those that

gave the response of don't know, their responses on current use and intention were used to sort them into the two groups of family planning attitude. Those that said they are current users or non-users who intend to use in future were coded as 1 and non-users who do not intend to use in future coded as 0. Twelve binary logistic models are fitted for this dependent variable. Tables 7.3.a and 7.3.b give a summary of the logistic outputs.

Model 1 of Table 7.3a shows that the husbands' family planning attitude can be predicted by their ages, level of education and number of children desired in 1999 while age is not a significant predictor in the 2003 survey. Approval of family planning increases with each year increase in age and family planning approval is also positively related to education. Approval of family planning is however less likely among husbands that desire five or more children and much lesser among those that gave non-numeric response compared to husbands who desire four or lesser number of children. With each additional surviving child, approval of family planning marginally increases in both survey years but these are not significant.

Table 7.3a. Odds Ratios of the Binary Logistic Model of Husbands' Family Planning Attitude by Their, Their Wives' and Their Shared Characteristics.

	1999			2003		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Husbands' Characteristics						
Age (ln)	2.107*	0.943	0.840	1.414	1.360	1.532
Education:	*	*	*	*	*	*
None	1.000	1.000	1.000	1.000	1.000	1.000
Primary	3.931*	2.242*	1.795*	1.914*	1.738*	1.567*
Secondary	6.705*	3.559*	2.651*	3.629*	3.228*	2.563*
Tertiary	7.424*	5.192*	2.796*	4.577*	4.455*	2.900*

Number of surviving Children:	1.017	1.037	1.026	1.002	1.021	1.033
Desired Number of Children:	*	*	*	*	*	*
< 5	1.000	1.000	1.000	1.000	1.000	1.000
≥5	0.484	0.656	0.748	0.217*	0.261	0.285
Non-numeric	0.242	0.354	0.441	0.055*	0.066	0.073
Couples' Shared Characteristics						
Residence:		*				
Urban		1.000	1.000		1.000	1.000
Rural		0.770	0.877		1.056	1.178
Region:		*	*		*	*
North East		1.000	1.000		1.000	1.000
North West		0.881	0.728		1.249	1.231
South East		3.175*	1.983*		0.872	0.689
South West		5.226*	3.415*		2.409*	1.835*
Status of Union:					*	*
Formal		1.000	1.000		1.000	1.000
Cohabiting		1.462	1.483		6.067	5.093
Type of Union:					*	*
Monogamous		1.000	1.000		1.000	1.000
Polygamous		0.814	0.944		0.684	0.707
Wives' Characteristics						
Age (ln)			1.099			0.828
Education:			*			
None			1.000			1.000
Primary			1.486*			0.964
Secondary			1.559*			1.672
Tertiary			5.295*			2.009
Number of surviving Children			1.009			0.997
Approval of Family Planning:			*			*
Disapproves			1.000			1.000
Approves			1.800			1.494
Desired Number of Children:						
< 5			1.000			1.000
≥5			1.050			0.748
Non-numeric			0.799			0.661
Constant	0.044*	0.572	0.486	0.549	0.483	0.574
R^2	0.254	0.359	0.390	0.296	0.333	0.351
% of outcome correctly predicted	69.3	73.8	74.5	70.7	72.4	73.3
Number of Observations	1280	1280	1280	1168	1168	1168

* significance

In model 2, whether the couples are in formal or cohabiting union have no effect on the husbands' approval of family planning. Only type of place of residence and region are significant predictors of the husbands' family planning attitude in 1999 while region as well as status and type of union were significant predictors in 2003. Approval of family planning is less likely among husbands from the rural areas compared to those from the urban areas. The husbands from the North West are less likely and those from the South East and South West are more likely to approve the use of family planning in 1999 compared to those from the North East while in 2003, husbands from the South East are less likely and those from the North West and South West more likely to approve the use of family planning compared to husbands from the North East. Husbands in cohabiting union are more likely to approve family planning compared to those in formal union in both survey years although this is only significant in 2003. Husbands in polygamous union are also less likely than those in monogamous union to approve family planning in both surveys but this is only significant in 2003. This model shows that the husbands' approval of family planning is determined by the husbands' individual characteristics as well as their shared characteristics with their wives.

Model 3 shows that the wives' level of education and family planning attitude are significant predictors of the husbands' family planning approval in 1999 while it is only the wives' family planning attitude that is significant in the 2003 survey. The higher the levels of education of the wives, the more likely the husbands approve family planning in both survey years (except those with primary level education in 2003 who are less likely than those with no education). Wives of husbands that approve family planning are also

more likely to approve family planning. This model gained some precision over model 2. The husbands' family planning attitude can therefore be predicted by their individual characteristics, their wives' as well as their shared characteristics.

Table 7.3b. Odds Ratios of the Binary Logistic Models of Wives' Family Planning Attitude by Their, Their Husbands' and Their Shared Characteristics.

	1999			2003		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Wives' Characteristics						
Age (ln)	1.764	0.997	0.971	0.715	0.482*	0.699
Education:	*	*	*	*	*	
None	1.000	1.000	1.000	1.000	1.000	1.000
Primary	3.607*	2.553*	2.094*	2.501*	1.884*	1.411
Secondary	8.305*	5.446*	3.921*	4.727*	2.783*	1.636*
Tertiary	17.506*	11.087*	7.116*	5.996*	4.266*	1.698
Number of surviving Children:	1.159*	1.182*	1.157*	1.211*	1.240*	1.250*
Desired Number of Children:	*	*	*	*	*	*
< 5	1.000	1.000	1.000	1.000	1.000	1.000
≥5	0.386	0.406	0.397	0.376	0.440	0.466
Non-numeric	0.151	0.190	0.208	0.189	0.218	0.246
Couples' Shared Characteristics						
Residence:		*	*			
Urban		1.000	1.000		1.000	1.000
Rural		0.694	0.709		0.946	0.996
Region:		*	*		*	*
North East		1.000	1.000		1.000	1.000
North West		1.920*	2.205*		0.827	0.761
South East		3.022*	2.650*		1.426	1.314
South West		4.159*	3.495*		4.470*	3.646*
Status of Union:						
Formal		1.000	1.000		1.000	1.000
Cohabiting		0.973	0.910		300.013	255.198
Type of Union:					*	
Monogamous		1.000	1.000		1.000	1.000
Polygamous		1.051	0.962		0.703	0.815

Husbands' Characteristics						
Age (ln)			1.001			0.639
Education:						*
None			1.000			1.000
Primary			1.323			1.533*
Secondary			1.364			1.852*
Tertiary			1.338			2.773*
Number of surviving Children			1.046			0.991
Approval of Family Planning:			*			*
Disapproves			1.000			1.000
Approves			1.833			1.486
Desired Number of Children:			*			
< 5			1.000			1.000
≥5			0.828			0.643
Non-numeric			0.529*			0.642
Constant	0.072	0.314	0.283	1.954	6.707	9.574
R^2	0.363	0.405	0.430	0.226	0.300	0.333
% of outcome correctly predicted	73.9	75.4	75.7	69.2	70.6	72.6
Number of Observations	1280	1280	1280	1168	1168	1168

* significance

It is shown in Table 7.3b that the wives' level of education, number of surviving children and desired number of children are significant predictors of their family planning attitude in both survey years. Family planning approval is more likely among wives with some level of education and this increases as level of education increases. Wives who desire five or more children and those who gave non-numeric response are less likely to approve family planning compared to those that desire four or lesser number of children while with each additional child, approval of family planning is more likely.

In model 2, type of place of residence and region are the significant predictors of the wives' family planning attitude in 1999 while type of union replaced type of residence in the 2003 survey. The wives from the rural areas are less likely to approve family planning compared to wives from the urban areas in both survey years but this is only significant

in 1999. The wives from the other three regions are more likely to approve family planning compared to those from the North East in 1999 while wives from the North West are less likely to approve than those from the North East in the 2003 survey. Wives that are polygamously married are more likely in 1999 and less likely in 2003 to approve family planning than the monogamously married. This is however not significant.

In model 3, the wives' approval of family planning is significantly predicted by their husbands' family planning attitude and desired number of children in 1999 and by the level of education of the husbands and family planning attitude in 2003. In both years husbands that approve family planning are significantly more likely, compared to those that disapprove, to have wives that approve family planning. Husbands that desire five or more children and those that gave non-numeric response are less likely than those that desire four or lesser to have wives that approve family planning. Wives' approval of family planning is also more likely as the level of education of the husbands increases. From the foregoing, the wives' approval of family planning is predicted by their individual characteristics, their husbands' as well as their shared characteristics in both survey years.

Just as in the models for desired number of children, the husbands' family planning attitude is dependent on their individual characteristics, their shared characteristics with their wives as well as some of the wives' characteristics while the wives' family planning attitude is also determined by their individual characteristics, their shared characteristics with their husbands as well as some of the husbands' individual characteristics. In the

case of family planning attitude however, model 3 has the best precision of the three models constructed for both the husbands and the wives. This is shown in Table 7.3c.

Table 7.3c. Nagelkerke R^2 Values of the Three Models of Family Planning Attitude

	1999		2003	
	Husbands	**Wives**	**Husbands**	**Wives**
Model 1	0.254	0.363	0.296	0.226
Model 2	0.359	0.405	0.333	0.300
Model 3	0.390	0.430	0.351	0.333

7.4. DISCUSSION

Examination of the couples' characteristics shows an array of differentials that could even explain their observed fertility regulation attitude and behaviour. The results of the analysis of the couples' characteristics show that over two-thirds of the couples reside in the rural area and there were more couples from the North compared to the South especially in 2003 in the total sample of couples.

The husbands are more educated than the wives both in quality and numbers and little difference is seen between the two surveys by the percentages of the various educational categories. The husbands are also about ten years older than their wives and have more surviving children than the wives. This could be attributed to some of the husbands having more than one wife or having gotten some children out of wedlock or from previous marriage(s). Percentage of wives with more surviving children than the husbands is low (7.6 and 5.1 percents in 1999 and 2003 respectively). The out of wedlock and previous marriage(s) explanation could explain this too.

Finding such a low level of informal union is not surprising as marriage and childbearing are almost universal in the country and are still guarded to a large extent by cultural norms and values. Polygamous union is fairly common in the country. The high percentage observed in the 2003 survey could be as a result of the high proportion of couples from the Northern part of the country that are more likely to be in polygamous union. This is so because majority of the people in the North are Muslims. Polygamous union is well enshrined in the religion.

Percentage of husbands and wives who disapproved of family planning is high compared to approval in the two surveys. This perhaps is explainable by the high percentage of husbands and wives that reported a desired number of five or more children because, when people desire or favour high number of children, the motivation to support or use family planning methods is fluid or lacking. More husbands than wives gave non-numeric responses to the question on desired number of children they would have had. Although no analysis of factors associated with responses on desired number of children was done, the practice (giving non-numerical response to question on desired number of children and related issues) is rooted in fatalism. The high level of fatalism regarding fertility is well documented in demographic literatures (McCarthy and Oni, 1987; United Nations, 1988; Zafar, Ford and Ankomah, 1995).

The multinomial logistic regression results show that in both surveys, the husbands' and wives' desired number of children is predicted by their individual characteristics, their shared characteristics with their spouses as well as some of the their spouses' individual

characteristics. For husbands and wives that desire five or more children, their desired number of children is significantly predicted by their level of education and family planning approval while number of surviving children also applies (in addition to these two) for husbands and wives that gave non-numeric response.

Status of union had no effect whatsoever in determining the desired number of children of the husbands and wives. This could be due to small number of respondents in the cohabiting category. The type of union however has influence on desired number of children especially among the husbands/wives that desire five or more children. It is interesting to note that only desired number of children of the spouses have effect on that of their partners of all the spouses' individual characteristics entered into model 3 for those that desire five or more children while the factor varies widely among those that gave non-numeric responses.

The multinomial logistic regression analysis basically shows that some husbands' and wives' individual characteristics affect their spouses' desired number of children. This result suggests that the traditional control of couples especially that of husbands over the wives could be declining as no difference is really seen here between husbands' and wives' influence over each other's desired number of children.

The highest level of education (except for the wives in model 3 of 2003) and desired number of children are significant predictors of the husbands' and wives' family planning attitude in all the models for both survey years. Likewise, region is a significant predictor

among the couples' shared characteristics (model 2) while family planning attitude of the spouses is significant in models 3. The interrelation in the couples' individual and shared characteristics on their attitude to fertility regulation in this population is of note but this does not imply equal influence over each other's family planning attitude. For example, the wives' education had an influence on the husbands' family planning attitude in 1999 but by 2003, the situation was reversed and the husbands' influence on the family planning attitude of the wives became greater. These results are similar to those found by Ezeh (1993) in his study of Ghanaian and Kenyan couples except that the husbands' attitude to family planning in Kenya depends entirely on their individual characteristics. DeRose (2003) also found that the women's fertility desires are strongly influenced by the husband's education but not vice versa.

From these analysis of spousal influence and those carried out on the extent to which different categories of couples have been able to implement their fertility preferences in the previous chapter, the upper hand that the husbands are found to have regarding various aspects of fertility issues (Bankole and Singh, 1998; DeRose, Nii-Amoo Dodoo and Patil, 2002; DeRose, 2003) is not strongly supported. This could be as a result of some important variables that were not entered into the model (as attested to by the low R^2 values) - for example, third parties such as the parents, parents-in-law and social groups, which often times influence fertility decision-making and outcome (Nii-Amoo Dodoo, 2001; Smith, 2004). In addition, there is the limitation of secondary data at looking at the context of issues thereby limiting the finding and interpretation of certain issues (especially those with cultural links). This and other related issues will be

examined with qualitative information gathered from twenty-four focus group discussion (FGD) sessions held across the country in the next chapter.

CHAPTER 8

FERTILITY PREFERENCES AND ACHIEVEMENTS: EVIDENCE FROM FOCUS GROUP DISCUSSION

8.0. INTRODUCTION

In the framework of the determinants of fertility from the microeconomics perspective used in this study, fertility is determined by natural fertility, wanted fertility and the index of preference implementation. This index in turn is determined by the costs of fertility regulation and that of unwanted childbearing (Bongaarts, 1993). However, there is no convenient quantitative relationship linking the degree of preference implementation to its determinants. The focus group discussion sessions were therefore carried out to primarily explore and explain fertility preference behaviour and to corroborate the quantitative findings on fertility issues in general.

The FGD sessions were guided by the following themes: Norms about number and quality of children; fertility regulation methods and costs as well as what hinders or facilitates couples to achieve a particular family size. Section 8.1 presents the characteristics of the focus group discussants while sections 8.2 – 8.6 present the FGD discussions by themes and direct quotations are made from the discussions to illustrate points made. The excerpts presented are basically summaries of discussants' opinion. Effort is also made to represent differences in opinions wherever they occur.

8.1. BASIC CHARACTERISTICS OF THE FOCUS GROUP DISCUSSION PARTICIPANTS

Table 8.1 below shows that a total of eighty-nine men and eighty-five women took part in the twenty-four focus group discussion sessions. In the South East, the men are two years older and have 0.4 living children more than the women on the average. In the North and the South West, the ages of the men and women are similar. While the number of living children is also similar between the sexes in the South West, the women in the North have about 1.3 children more than the men. Over half of the men and women from the South East and women from the North have more than four living children.

Table 8.1. Basic Characteristics of the Focus Group Discussion Participants.

FGD groups by region	Number	Mean Age	Mean # of children	# with more than 4 children
South East (Imo State)				
Urban Men (S+)	8	45.3	4.8	4
Urban Men (S-)	8	43.6	6.6	7
Rural Men (S+)	8	34.8	3.5	2
Rural Men (S-)	8	43.8	5.6	5
Urban Women (S+)	8	45.9	3.8	4
Urban Women (S-)	8	36.3	5.0	4
Rural Women (S+)	8	37.5	4.4	6
Rural Women (S-)	8	39.5	5.8	5
Total sample of Men in region	32	41.8	5.1	18
Total sample of Women in region	32	39.8	4.7	19
North (Kano State)				
Urban Men (S+)	6	37.0	2.8	1
Urban Men (S-)	7	36.0	1.1	-
Rural Men (S+)	6	40.5	5.0	2
Rural Men (S-)	6	45.2	4.7	4
Urban Women (S+)	6	37.8	3.8	2
Urban Women (S-)	7	39.9	6.2	5
Rural Women (S+)	6	42.0	4.7	3
Rural Women (S-)	7	40.0	7.4	5
Total sample of Men in region	25	39.5	4.3	7
Total sample of Women in region	26	39.9	5.6	15

South West (Oyo State)				
Urban Men (S+)	8	48.0	3.4	2
Urban Men (S-)	8	41.6	4.5	3
Rural Men (S+)	8	44.0	3.1	1
Rural Men (S-)	8	32.1	2.1	-
Urban Women (S+)	8	45.5	3.4	-
Urban Women (S-)	8	45.0	4.1	3
Rural Women (S+)	5	38.6	3.4	-
Rural Women (S-)	6	36.0	3.0	1
Total sample of Men in region	32	41.4	3.3	6
Total sample of Women in region	27	42.0	3.5	4
Total # of FGD groups:	Men - 12;		Women - 12	
Total # of participants:	Men - 89;		Women - 85	
Total # with more than 4 children:	Men - 31;		Women - 38	

Note: S+ = secondary level of education and above; S- below secondary level of education.

8.2. NUMBER OF DESIRED CHILDREN

The first discussion initiated was to explore societal expectation as well as individuals' desired number of children. This is a very crucial determinant of the extent to which people implement their fertility desires as when desires are high, there will be little gap between natural and wanted fertility and when desires are low, the gap might be large. The question asked was:

> "In some communities, people might be expected to have a particular number of children. In some countries, for instance, no more than two children may be seen as desirable for most people. What would you say is the number of children people are expected to have in this community and what are the reasons for this particular number?"

The majority of the discussants do not believe in specifying the number of children they should have. This is deeply rooted in cultural tradition and religion. They see children as being given by God; hence, no one can basically say how many they want. These ideas are reflected on the discussion as follows:

"No one should say that 'I will have only three or four' because God that created us knows the best for us and we should accept what He gives to us whether seven, eight, nine or twelve" (Male, South East, Urban).

"In Islam, a person is not directed to have a certain number of children, so one is given the chance to have as few or as many children as he likes" (Male, North, Urban).

"In the Yoruba community we are expected to have as many as we can and that is why the slogan says, 'you don't count children'. We don't like counting our children" (Male, South West, Urban).

After voicing their religious and traditional persuasions however, most discussants from the South East mentioned that people should have as few or as many as they could cater for and some go ahead to give numbers. Some from the North also concur to the idea of people having as few or as many children as they can cater for. Some illustrative numbers are also given in the North about some people living in the communities while in the South West, a sizeable number of the discussants gave numbers. The 1988 four-child population policy by the government was only referred to in the South West. This could have impacted on the number of children desired by this populace as most of them mentioned four as their desired number. Most of the discussants however attributed the desired number to other reasons. There was not much difference in the views and opinions of discussants by residence, sex or education on this issue.

"I think there is no number someone has that is enough for the person. It is only required of the person to have that which he can train. I think five is good" (Male, South East, Urban).

"Some people decide on having one, two or three children. After they have gotten the number they want, they stop. But only few of people in our community have this idea" (Male, North, Urban).

"Four is the laid down rules but this is political not traditional. Traditionally, one can have as many as possible" (Female, South West, Urban).

REASONS FOR THE DESIRED NUMBER OF CHILDREN

On the reason for the decision to have the stated (or not stated) number of children, majority of the discussants in the North are first of all of the opinion that the only reason to decide on a certain number of children is ill health of the woman. In general however, most of the discussants from all the regions recognised that the **economic situation** in the country has changed and that steps have to be taken to be in tune with the situation in the country. Below are some of what the discussants said:

"No specific number except the woman is the type that suffers when giving birth. It is those couples that plan their family" (Female, North, Rural).

"Things have changed. The economy of the country is bad. It is better one has the number one can maintain" (Female, South East, Rural).

"In the North we didn't have that idea, but presently due to economic problems encountered, people are now doing this (i.e. deciding on number of children) because of the problems being faced concerning how to cater for the family" (Male, North, Urban).

"The English say 'cut your coat according to your size'. But nowadays, it is 'cut your coat according to your cloth'. A truck full of children is a truck full of poverty" (Male, South West, Urban).

In addition to economic consideration, other reasons given for the desired number of children include:

Effective guidance and control of the children. From the discussions, this is highly rated by majority of the discussants as they believe that too many children may not be manageable for a couple given the type of living arrangement and the social changes that have taken place in the society where community control of children is fast disappearing. Discussants are aware of the dangers and are scared of the consequences that could emanate from not doing a good job of giving an all round training to their children. They are particularly worried about the children turning into social misfits and not leaving a good legacy after their demise. The following are some of the discussants' remarks:

"When you have many children and you're unable to train them, there is no type of character that will not be in that family" (Female, South East, Rural).

"To be able to give them quality care because one wants the children that will survive him to be someone that will have good education and morals. So that by the time the parents are no more, they will leave behind a good legacy" (Male, South West, Urban).

Religion

Adherence to one religion or the other is universal in Nigeria and this has a profound influence on the way of life of the people including reproductive issues. Religious beliefs and injunctions came out as one of the reasons for the number of children that people desire. Excerpts on this include:

"The main reason why people want to have many children is because of the prophet's saying that 'marry and produce a good generation for I shall be proud of your great number on the Day of Judgment'" (Female, North, Rural).

"In the Bible God said marry, increase and multiply" (Male, South East, Urban).

Old age care and provision

From the sessions, this is a very important consideration in deciding the number of children. It has long been recognized and cited as one of the reasons for high fertility (Schoumaker, 2004). Majority of the discussants indicated the care they expect to have from their children in terms of love, company and being there to render any assistance they might require in general. This consideration transcends region, residence, gender and education differentials among the discussants. The following are some of the views of the discussants on this:

"We have many children because if they grow up they will support us. Presently I am living with my son. My children are the ones taking care of feeding and clothing me since the death of my husband. That is why we are proud of having many children" (Female, North, Urban).

"Nobody knows how God will bless each child. And you don't know who among them will support you later in life" (Male, North, Rural).

"We rely on children for old age. This is not like America where they pack their old people in a place and government is catering for them. The lesser children you have the lesser care that person will have in old age" (Male, South West, Urban).

Family business needs

It came out clearly that people consider the preservation of wealth and skills in the family when deciding on the number of children to have. The family's manpower needs to sustain family work or business is also considered. This is particularly so for people in the North in general and those from rural areas in the South. The people in the North are engaged in both crop farming and livestock rearing while those from the South are mostly engaged in crop farming and at a lesser commercial scale than people in the North. Some of the quotations from the discussions are given below:

"In this part of the country, people want to have many children because in our own case we only know farming and livestock rearing and the children help us in our day to day activities like farm work and so on" (Male, North, Rural).

"Not having many children in the family makes domestic work to be very dull especially farm work because in Igbo land, we believe in farm work" (Male, South East, Rural).

"In this our community, we farm very well. So, we need children to help us on the farms" (Male, South West, Rural).

Death of Child(ren)

Death of Child(ren) has long been recognised as a vital determinant in reproductive decision-making (Chowdhury, Khan and Chen, 1976; Legrand, Koppenhaver, Mondain and Randall, 2003; Randall and Legrand, 2003). This usually takes the form of insurance effect or child replacement. In the case of insurance, people have more than needed with the hope that even if some die, some will be left while for child replacement, another child is born when one dies. Child mortality effect is built into the decision-making of this populace (especially those from the South West) mainly through the form of insurance. Below are some of the opinions of the discussants on this issue.

"The reason why I said six is because, some may die. You don't wait for that to happen before you take action. It is better to insure against it" (Male, South West, Rural).

"Supposing some of the children die, what does one do? That is why one should have more than four" (Female, South West, Rural).

Culture and customs

The sessions show that it is customary to have children in all the cultures especially for lineage continuation and securing inheritance. The sentiments attached to having children

culturally include the prestige and respect accorded to parents in the community. It also includes some of the roles (such as representation) that the children perform for their parents in the community. Some of the discussants are even of the opinion that for someone that has no child, it is better the person was not born because he cannot answer to being a man. Preference for at least a male child came up in the course of the discussion on lineage continuation as it was said that the girl-child leaves the household to take up her husband's family name after marriage thereby depleting her biological household. The importance of this is captured by some of these quotations:

"The Yoruba regard children as legacy. They have as many as possible, so that whenever they pass away, they will have surviving children to take care of their possessions" (Male, South West, Urban).

"The Igbo man believes in numerical strength. One who has many stands the chance of the challenges of life" (Female, South East, Urban).

"I shall conclude this part of the discussion by saying that whosoever does not have a child throughout his lifetime, then it is as if God has never created him. Because the moment he dies, everything concerning him dies forever" (Male, North, Rural).

Other reasons given for the desired number of children are that: the children may act as a support to each other later in life; some parents, especially those that have only one child prevail on their children to have many children; and that some people have few number of children because they fear that they might die early and leave behind many little children in hardship. The section concludes with this remark by one of the discussants:

"There will always be problems whether the family size is small or large" (Male, South East, Rural).

8.3. HOW DESIRES ARE ACHIEVED

The question asked here was "What are some of the things that people do to have the number they want?" This is to explore what people are doing to have only the number of children that they desire. A number of ways and means were given by the discussants.

This issue was discussed along two lines. The first line recognizes that in general, people tend to have more than they actually desired. Hence what they are practicing to limit their potential output to the desired number is discussed. The second line of discussion recognizes the fact that some people are unable to have up to the number that they desired. How the number can be improved upon to the desired one is discussed here.

In general, discussants believe that steadfastness in prayer and reliance on God, as the ultimate planner is the key to having the desired number of children. Some of the discussants from the South East and South West also think that love, mutual understanding and a firm agreement between couples are important to having the desired number of children.

"Most of those that are practising birth control think that they are the ones that are planning their lives. If one is lucky and his plans are the same with what God has planned for him, that is when he succeeds" (Male, North, Rural).

"God is Omnipotent. With Him, everything is possible. If couples have steadfast prayers to God, they will achieve their goal" (Female, South East, Rural).

Regarding what is done to achieve the desired number in situations where the tendency to have more is high, a number of strategies were mentioned. The discussants are very knowledgeable about the reducing effect of some postpartum variables on fertility. Some

said following the traditional methods of family planning, such as avoiding sex relations while breastfeeding is one of the ways to having the desired number of children. They also made mention that it is natural for some women not to menstruate until after weaning their babies, which helps in spacing the children. Some traditional and modern methods of abortion are also recognized and mentioned by few discussants from the North and South West as ways of achieving the desired number. They are however quick to say that the option is unlawful and a sin against God.

Controlling the rate of marrying by having only one wife is mentioned as one of the ways to having the desired number of children. For those that are unable to have up to the desired number however, having more than one wife is an option to achieving their desire. Adoption of children of close relatives is also done by some especially where medical treatment fails or not visible. Lastly, majority of the discussants believe that the best way to have the desired number and when they wish to have them is to consult medical practitioners (including family planning personnel) for ways and means of going about it.

"Seek doctor's advice for family planning because what is good for A may not be good for B" (Female, South East, Urban).

"To ensure that couples have no more than the exact number of children they want, they should consult a medical doctor for advice on how to control birth" (Male, North, Rural).

Stemming from the expression of this opinion by majority of the discussants, the knowledge, attitude, practice and belief of the discussants on the use of family planning was explored. Most of the discussants mentioned the methods used or to be used or

known as well as obstacles to use. The use of modern as well as traditional methods was discussed extensively by discussants. Again, not much difference is seen on this issue in terms of type of place of residence, sex or education. Discussants were quite knowledgeable about the methods and their availability.

Modern methods

The types of modern contraceptive methods mentioned include: pills, withdrawal, ovulation/billings (also referred to as calendar or natural by some discussants), sterilization, male and female condom, injection and intra-uterine devices (IUD). Sterilization is only made mention of in the North and South West while most respondents from the South East favour the natural methods. The withdrawal method is also the favoured method in the North as the Muslims from time immemorial have always practiced it (Sahih Muslim, nd). The following are some of the discussants' views:

"In my own view the best method of contraception is permanent sterilization. Because whenever a woman undergoes that, she will never conceive again" (Female, North, Rural).

"The oldest method is called 'au' (withdrawal) and this is the method that Islam suggests for family planning" (Male, North, Rural).

"The best method is the Billings method. It does not require any expenditure. Only that the man has to control his sexual desires" (Male, South East, Rural).

Traditional (indigenous) methods

Traditional methods of family planning were only mentioned by discussants in the North and South West regions of the country. The Northern region seems to have a good variety of the methods. This discussion that brings to light these methods is particularly a welcome development from the North, as not much is known about the dynamics that surround fertility in the region. Effort is made here to highlight as many as possible of the methods using direct quotes from the discussants.

"Since in the past, the Hausa people have their own method of family planning and birth control. There is a medicine consisting of some herbs and it is tied like a charm (laya[2]). So whenever a husband and wife have sex relation and this charm 'laya' worn, by God's will, she will not conceive" (Male, North, Urban).

"There are some traditional methods of birth control used by some of our people such as 'guru[3]', if the woman tie it around her waist, by God's will she will not conceive" (Male, North, Rural).

"There is another one that is made with the skin of a female sheep. After slaughtering the sheep, the skin is removed and processed to become dry. If this is spread and sex relation takes place on it, conception will not take place. Also, if a vulture's feather is woven with the bark of a plant called 'rama[4]' and tied by either the husband or wife during sex relation then she will not conceive" (Male, North, Urban).

"There is a friend of mine that is using a certain seed of a tree to prevent conception. This seed is taken orally every year" (Female, North, Urban).

"Our fathers provided us with rings, necklaces and other such things. They normally use it before the inception of family planning health centers" (Male, South West, Rural).

"There are also traditional methods like ring or amulet that is tied around the woman's waist" (Male, South West, Rural).

[2] A charm made as a necklace worn around the neck or pinned to the hair
[3] Another charm, made like a rope and belted/tied around the waist.
[4] An indigenous tree that the English or botanical name could not be established. Its leaves are green and they are eaten like spinach.

"Some women are also using 'rubutu'[5] to prevent conception. She can use this 'rubutu' till the time she reaches menopause" (Female, North, Urban).

Obstacles to contraceptive use and their effectiveness.

Here, issues that influence the attitude, and practice of family planning as well as those that influence its effectiveness as discussed during the sessions are highlighted. Real and imagined issues about the side effects as well as failure of some of the family planning methods used and mentioned were raised by discussants during the sessions and examples given. The incompatibility of some women's biological makeup with the more effective methods of contraception (such as condom, pills, IUD) was also mentioned. In this regard, the 'supposed' health and psychological adverse effect of the use of contraception were the issues of concern. Here are some discussants views:

"The main reason why women fear using contraceptive drugs and devices is due to the harmfulness of the drugs. Some of the ills they cause are more complicated or difficult to bear than the hardships of labour. For labour, once you deliver you have finished suffering. But if you get a problem as a result of using contraceptive drug or device, you continue suffering up to the end of your life" (Female, North, Urban).

"There are some people that have had failure concerning the use of contraceptives. So this makes them to decide not to use any method of contraception anymore, because it could fail again" (Female, North, Urban).

The monetary cost of effective methods is also seen as a hindrance to use, as the woman or couple may not have the means when the method needs to be purchased, changed or updated. Some women are also afraid to be socially labeled in communities where the use of family planning is frowned upon. These are the type of women that are likely to take

[5] A writing done with a traditional pen made with straw and traditional ink. This writings are either some Quranic verses or some prayers done by some prophets. After the verses or prayers are written on a board, it is washed with water inside a bowl. This water is referred to as 'rubutu' and it is taken orally.

on what their friends are using or purchase an unprescribed one at shops. Husband's disapproval of use could also be a major factor in the decision to use and the type of method that could be used by a woman. This brings to fore the importance of bringing the men on board as partners on this issue by family planning programmers. Accessibility of the family planning centers in terms of distance was also mentioned. Others are simply scared of all the negative stories they hear about contraceptives. Some of the discussants have the following to say on these issues:

"Some women may not have money at the time they are supposed to renew the method" (Female, South West, Rural).

"The reason why there is problem or harm in the modern method of family planning is because people are misusing it. For example, there are some women that do not seek medical advice before they start using either contraceptive pills or injection. They just go and buy the pills or injection in a chemist and start using it on their own, and by so doing, if it does not suit them, they start getting complications, like bleeding and it can lead to other problems" (Female, North Rural).

"The main reason why women use contraceptive drugs or devices any how is because, some husbands do not like the idea of family planning, but the wives like it. So instead of her going to the hospital, she just seeks advice from her friend" (Female, North, Rural).

"There are some women who need it but the family planning center is far from their community while some think that family planning is bad and forbidden in the community" (Male, South East, Urban).

"Those of us that have never used are afraid because of all these side effects that we hear about" (Female, South West, Rural).

To conclude this section, a number of suggestions on family planning methods, use and uptake were given by the female discussants from the North and are reproduced below:

"The government should become involved in this, whenever a woman uses a contraceptive drug or device and gets problem as a result, the manufacturers of the

product must be held responsible and they must sponsor the treatment. If this measure is taken, women will not be afraid of practicing family planning (Female, North, Urban).

"The manufacturers of contraceptive drugs and devices should try and discover other contraceptive drugs and devices that won't be harmful to us. Since the ones that are used presently are mostly harmful, some of them are said to be causing diseases like cancer, high blood pressure, diabetes and so on. If harmless drugs or devices are discovered, most women will accept it. Most women are just giving birth, because they have nothing to do about it. If they were asked, some will prefer to stop giving birth permanently" (Female, North, Urban).

"People should be informed that, what is meant by family planning is not that they must only have a certain number of children, but it also mean to space between births (Female, North, Urban).

8.4. FACTORS THAT HINDER HAVING OR FACILITATE HAVING MORE THAN THE DESIRED NUMBER OF CHILDREN

The question asked here was "what are some of the things that might cause people to have less or more than the desired number of children?" This question was asked in recognition of the fact that many people do not have exactly the number of children that they desire. While some will have less, others will have more. Here also, not much difference is seen in the opinion of discussants by sex, residence, region or education.

FACTORS THAT HINDER HAVING THE DESIRED NUMBER

Some of the factors that the discussants perceive as hindrances to having the number of children desired include:

Economic hardship

This came up strongly as a reason why people have lesser than they desire. Its effect comes primarily in the form of inability of parents to adequately clothe, feed, educate or provide other essentials of life to the children. This is made worse by the high costs of

goods and services in the country and limited economic activities available to parents. These two constraints with the desires of parents to have contemporary quality children have forced people to limit the number they have even if it implies not having their desires in terms of number. Some of the respondents said:

"If not because how life has changed, we are proud of having many children. But at this present time, you don't even have to be told to stop because everyone both the rich and poor know, the condition which the country has fallen in" (Female, North, Urban).

"Not being economically buoyant can prevent couples from having the number they want" (Female, South East, Rural).

"Nowadays, the situation in the country is not easy, that is why people are now limiting the number of children" (Male, South West, Urban).

Infertility or God's will

All the discussants know one person or the other with infertility problem and some of them are experiencing it or have experienced it. It seems to be a big issue because of the traditional values attached to children but moderated by religious values, as it is believed that it is God that gives children. From the discussions some of which are reproduced below, it is usually suspected that a major cause of infertility is complication from previous abortions or a result of leading a wayward life previously. Hereditary factor was also mentioned as a possible cause.

"You may be expecting a large number but God says no, this is the number you are getting. You have no option" (Male, South East, Rural).

"Having contracted some venerable diseases during the youth age could prevent people from having the expected number" (Female, South East, Rural).

"The man may have a low sperm count and therefore, unable to impregnate the wife" (Female, South, Rural).

"Complication arising from previous abortions could cause infertility for some women" (Female, South West, Rural).

"It could be heredity, some of the people inherit the number of children from their parents. There are some families that, after having two or three children, they stop" (Male, South West, Urban).

Ill health (including miscarriages and caesarean section).

Some medical conditions such as sickle cell anaemia, leukaemia, heart problem and a host of others are not very favourable to carrying pregnancies. This might hinder the affected people from having children at all or not having up to their desired number. The discussants mentioned that, even some people that did not have any medical condition sometimes have it rough during pregnancy and this could act as hindrance to having the desired number. History of having births by surgery (caesarean section) could also lead to people not having the desired number. Others factors mentioned include accidents, recurrent miscarriages and rhesus (blood group) incompatibility of couples. All these could hinder the people from eventually having the number that they desire. Below are some excerpts on this discussion.

"Some people don't like giving birth because of the difficulties they face during pregnancy period up to delivery" (Female, North, Rural).

"A woman that delivers by caesarean section has to have few children so that she does not die in the process of childbearing" (Male, South West, Rural).

"May be due to the health condition of the wife or the children. So, they have to limit the number of children that they are going to have" (Female, South West, Rural).

"For accidents like spinal cord injury, there is no way the person can continue. Somebody with the deadly disease AIDS cannot also go on rearing children otherwise the cost will be too much and the risk, very high" (Male, South West, Urban).

"According to the medical people if the wife or husband has negative blood group, after having the first child if the woman did not take the necessary injection within 72 hours they may not be able to have more live children again and so this people will not be able to have the required number of children" (Male, South West, Urban).

"Miscarriages may prevent couples from having the number they expected" (Male, South East, Rural).

Living apart/separation/divorce/widowhood

Living in separate homes by couples may prevent them from mating at the right period and as often, as they should. Separation, divorce and death of one of the spouses (including time lag between these events and remarriage where it occurs) are also mentioned as some of the reasons that could hinder people from having the number of children that they desire.

Death of Child(ren)

Death of some of the children could prevent people from having the number of children that they desire especially if it occurs when the woman is aged or when she has taken on a form of permanent childbearing cessation control. In these situations, going on to replace the dead child could be difficult even if the woman is willing to do so. The following are some of the contributions of the discussants on this:

"For some people, when they lose a child, they don't go on to have a replacement" (Male, North, Urban).

"If they lost any of the children and the woman has not reached menopause they can give birth to another. But if she has reached, there is nothing that they can do" (Male, South West, Rural).

Late marriage

Age limit for births seems to be a problem for women only from the discussions.

"For some women, by the time they get married, they have reached an age in which they have got less chance of reproduction, ... So, they are not able to reproduce as many children as they want" (Male, North, Rural).

Occultic influence

It was mentioned by some discussants from the South East and South West that casting witchcraft spell or some other form of supernatural power on a woman or couple could prevent them from having the number of children that they desire. One of the discussants said:

"If there is the hand of the wicked ones in the family, they may prevent a man or woman from getting the children they desire" (Female, South East, Rural).

Lack of unity

Some of the respondents from all the regions are of the opinion that lack of unity and love among couples may cause couples not to have the number of children that they are supposed to have, as there will be continuous rancour and disruptions in the house.

FACTORS THAT FACILITATE HAVING MORE THAN DESIRED

Some of the factors that could facilitate having more than the desired number of children as discussed by the participants at the focus group sessions include:

Early marriage, remarriage and polygamous unions

Some women marry at very early ages and if they start having children immediately they get married, they have many children within a few years of marriage. Remarriage in the case of separation, divorce or the death of one of the spouses after the desired number has been reached could also lead to having more than desired as the couple may wish to have a/some child(ren) in the new relationship. This is somewhat captured by what one of the discussants said thus:

"When people remarry, the partners will want to have their own specie of children. That is the Nigerian situation, we marry for children" (Male, South West, Urban).

Rivalry among wives in a polygamous setting could lead to the man and the wives having more than they desire. This usually happens when the man is wealthy and wives compete amongst themselves in terms of the number of children they bear to be able to have a good chunk of the man's inheritance.

Sex preference

The focus group participants discussed this at length as highlighted in section 8.2 under the cultural demand for children. Participants in general are in agreement that both sexes are needed as they play certain crucial role in the family set up. However, the male-child is needed for continuity of the family name and hence, it's relative preference over the girl-child. It however came out that it is not only the wish to have boys that causes people to have more than they desire. Some couples that have boys only, go on to look for girl(s). Two of the respondents from the South West also give their personal experience. Below are excerpts from the discussions on this issue.

"It is a belief in Africa as a whole that male children are better than female children. Even husbands love their wives that have male children better than the ones with female children. So people go on to have as many as possible until they have the number of boys they want" (Female, North, Rural).

"If couples have a particular gender, they may be interested in balancing it with the other sex. So, they will continue" (Female, South East, Rural).

"I will continue until I have a male child" (Male, South West, Rural).

"It happened to me. My first six children were girls then somebody called me a name ("she-man"). I married another wife but continued to have girls" (Male, South West, Urban).

Other factors mentioned that could lead to having more than the number of children desired are: multiple births; societal or extended family influence - in particular that of parents and/or parents-in-law; a change in the financial status of couples for the better; conducive government policy such as the universal basic education[6](UBE) policy and abusive husbands who drink heavily. Both men and women from the South Eastern region of the country mentioned this. It is said that whenever such men arrive in their homes, the wife is in trouble. If she refuses his sexual advance, she is beaten blue and black.

Lastly, contraceptive failure, family planning ignorance and misuse were highlighted as factors that could lead couples into having more than the number of children that they desire. Discussants recounted instances of contraceptive failure, which led to the couples having more than the number they wanted. They also talked extensively on the plight of

[6] UBE (Universal basic education) is a Nigerian government policy launched in October 1999, which made it compulsory for every Nigerian child to be educated free of tuition up to junior secondary school (JSS) level in an effort to meet the country's manpower requirement for national development.

the uninitiated, who wish to use the methods but are too shy, intimidated, careless, misinformed or scared to go for it. Some of the discussants views are reproduced below:

"There is my sister that used an intra uterine device (loop) but despite it, she conceived and when she gave birth the baby came out with this loop in his hand. Still they did not give up. She changed to using contraceptive pills and again she conceived" (Female, North, Urban).

"Some people don't know the ways to follow in order to prevent additional births while others are just careless, in the sense that, he does not like it in his mind, but he is not taking any action in preventing it" (Male, North, Urban).

"Most women are illiterates. They may not know what to do or when to meet with their husbands. They just meet him on every request" (Male, South East, Rural).

"Some people believe if they use contraception, there will be a side effect. They complain about it although some of them have never used them at all. As a result, they have more children than expected" (Male, South West, Rural).

"Some people misuse the family planning methods and blame it on the method. For example, the woman may use the pill at 6 am today and 3 pm tomorrow or even forget to use it" (Female, South West, Rural).

"Some people say if you finished your menstruation and wait for seven days before having any sex relation with your husband, you won't conceive. Some people are following this method and they are succeeding. But God has the power to change what we wish" (Female, North, Urban).

In concluding this section, what the discussants suggested could still be done (in addition to those that discussants said are already being done in section 8.3 above) to have the desired number of children is discussed. Majority of the discussants are of the opinion that economic stability is necessary to achieve people's desired number of children. Also, as rhesus ((blood group) incompatibility is recognized as a hindrance to having up to the

number desired, a few of the discussants from the South West think that couples should go through blood screening before marriage.

A few from the South East are of the opinion that once the desired number is gotten; the woman should refrain from having sexual intercourse. The intrigue here is that if the onus is on the woman to abstain from sexual relation with her husband, with whom is the man expected to mate in a part of the country where majority of couples are in monogamous unions? Moderate consumption of alcohol is also advocated for the men to prevent too frequent and indiscriminate sex with their wives.

It was also suggested that people should not marry too early to avoid having too many children. The government is also enjoined to give incentives to people that have four children and a form of deterrent for those that have more.

8.5. CIRCUMSTANCES OF BIRTH, TREATMENT AND IMPLICATION OF ADDITIONAL CHILD

The question asked here was: “Generally, people have an idea of the number of children that they want but they often have more. When this happens, what can be said about the circumstances of the conception and what are the implications of having one more child? **Probe**: emotional, monetary, social as well as health costs”. This was done to explore the cost of unwanted childbearing from the perspective of the discussants.

On how people perceive the circumstances surrounding the birth of an additional child above the desired number, most discussants see it as accidental or God’s will but do not

see what can be done about it. This validates the response to questions on pregnancy wantedness in the quantitative surveys because people generally acknowledged the circumstance of the birth of additional child(ren). They are of the opinion that the situation should be accepted and that people behave responsibly as parents should, to the child. The child, they said, must also be given equal treatment as the others (the senior siblings), in terms of up bringing, feeding, education and other things as the child will eventually become a loving member of the family and the accidental nature of his/her birth forgotten. The following are some of the discussants' views on the issue:

"The situation is accidental I think, but the point is that almost every home will have fault. Even those of us that have planned" (Male, South West, Urban).

"It is not an abomination" (Male, South East, Rural).

"I think it is a bad thing for a father to regard his child that was unexpected as a problem to him. That can only happen within the European Community because they have certain strong opinions" (Male, North, Urban).

Others feel that such child could actually be loved and receive more care than his/her siblings. This they said usually happens when the woman is aged or there is a long interval between the pregnancy and the previous one. The first response to such pregnancy is usually the fear of whether they can successfully carry and deliver the pregnancy. When this comes to pass, and the baby is delivered safely, the joy and gratitude of overcoming the experience endears the baby more to the parents. Some discussants however said some parents abhor resentment towards such child due to the additional burden that they think he/she is while some others see the birth of the

additional child as a blessing. Discussants buttressed their views with stories of such happenings around them. Examples of the opinions expressed are:

"First and foremost, it is a blessing from God. There are people that wish to have but could not" (Female, South West, Rural).

"Women worry a lot whenever such happens to them because they will start remembering the hardships encountered during labour" (Female, North, Urban).

"The woman's life is in danger because strength goes down with every birth. Therefore it will affect her health" (Female, South West, Urban).

"To be sincere, if you are able to give birth to that child successfully, you will even love him/her better than the other children you have" (Female, North, Urban).

"Some people don't regard such children like the other children they have and usually, it is such a child that survives and become important in life" (Male, North, Urban).

IMPLICATION OF ADDITIONAL CHILD

Majority of the respondents talked mostly about the monetary and other negative implications of having a child above the desired number. This includes the cost of feeding, clothing, accommodating, educating as well as bearing the health care costs of the additional child. This additional cost could also impact negatively on the other children and the parents as room is being made to accommodate the additional child into the family budget. The need to source for extra income to moderate this was discussed and where this is not possible, the cycle of poverty that could be generated in the household lamented. The health and psychological implication this stress could have on parents were equally highlighted. The possibility of not being able to give proper moral upbringing to a larger number of children was also mentioned. Some of the views of the discussants are reproduced below.

"This depends on one's income. If the person has the ability, there won't be much problem. But if he does not, the problem lies in feeding, educating, clothing, and also giving proper upbringing to the children" (Female, North, Urban).

"It will cost more money to train the children. The man will have to work harder to meet the demands of the family" (Male, South East, Urban).

"Poverty may set in for the family" (Male, South East, Rural).

"The parents may not be able to control the children effectively thereby, the children may turn to bad ways" (Female, South East, Rural).

"If care is not taken it could create hatred between the couples" (Male, South West, Rural).

Some of the discussants however do not think having an additional child above the desired number is entirely a problem. The asset that the additional child could become and the services that he/she could render to the family could be unquantifiable. Some of them have these to say:

"It is fifty-fifty. It is that child that will provide company and services to the parents after the other children are long gone" (Female, South West, Rural).

"Well the advantages are there and there are disadvantages too. I know of a lady that was born unintentionally, and she later became the bread winner of the family and the parents used to say and 'we didn't want more child, this one just came by mistake, see what God has made of her'" (Male, South West, Urban).

"It is good in a way. During farming period, the man will have more helping hands" (Female, South East, Rural).

"If you can manage them and educate them it is an asset to the family in future. But the parents have to work harder especially if the economy is not on their side" (Female, South West, Urban).

8.6. DECISION ON CONTRACEPTIVE USE AND NUMBER OF CHILDREN

The opinion of discussants is varied here. While some believe that the husbands have absolute say, others believe it should be a joint decision while a third group thinks the decision should be taken by the woman since she is the one that goes through all the pains and suffering of giving birth and therefore knows how much she could take. Interestingly, the discussants that belong to each of these opinion groups are similar in number but with more men in the "husbands absolute say" group. Those that are of the opinion that the man's decision is supreme however recognize that this is subject to the woman's 'genuine' health condition. Instances of women colluding with health personnel to wriggle their way out of not having additional children were cited. On the other hand, some men take steps to stop their wives from having more children without the wife's consent. A case of one man in the northern part that signed the wife in for sterilization without the wife's knowledge was recounted:

"Some husbands do not seek advice from their wives concerning this. For example, there was one man that has a wife who always undergoes surgery whenever she is going to give birth... So this man took her to hospital and she received permanent sterilization, but she didn't know that she was sterilized permanently, because he did not tell her" (Male, North, Rural).

"Concerning contraceptive use, the husband's decision is stronger, because he is the one that married her. But if she has problem in giving birth, then he cannot take the decision alone, she also has a say about it" (Male, North, Urban).

For those who think that the issue should be left to the woman, apart from the fact that she is the one that is endangered in the course of childbearing, she is also the one directly in charge of her body and the balance of probability is that she will find a way to do

whatever she wishes even if she concurs with what the husband says. A number of experiences were cited where women go on to use contraceptives without the knowledge of their husbands because they would not want to trespass on his decision and they know that his decision on the subject will negate what they want.

"Concerning contraceptive use and number of children, the wife's opinion is stronger than that of the husband because she is the one that suffers the difficulties of pregnancy" (Male, North, Rural).

"In fact the husband only has power in his words, but in action the wife has more power since it is the wife that controls her body. Even where she agrees with her husband's want and inwardly she is against him, she will do whatever she wishes in practice" (Male, South West, Rural).

"Men believe you should use your discretion as a woman" (Female, South West, Urban)

"If the husband does not agree to contraceptive use, the woman should find a way of taking care at her own end" (Female, South West, Rural).

The joint decision-making proponents believe that these cases should not arise. They feel that both parties must be involved all through. One male discussant from South West, Urban posed the question of what will happen if the woman takes on a family planning method without the knowledge or consent of the husband and she develops complication? They are also of the opinion that if the couples have had a talk and agreed on the number of children that they desire, arriving at a decision concerning the use or non-use of contraceptives will not be a problem. Some of the discussants' views are as follows:

"It is not entirely left for the man to decide. The decision should be by the man and the wife" (Female, South East, Rural).

"The decision on contraceptive and number of children has to be taken by both, the husband and the wife but according to the Yoruba custom it is the husband that has to stamp those decisions" (Male, South West, Urban).

FURTHER EXPLORATION

The power relation was explored further by asking discussants to comment on how a hypothetical couple (Mr & Mrs Wazobia) should handle the conflict in their house. In the first scenario, the woman wants four but the husband wants eight children while in the second scenario, the man wants four but the wife wants eight children.

Husband wants more

Majority of the discussants (both the males and the females) feel that the man should have additional wife/wives to make up the number that he wants. While the men looked at it basically from the point of achieving their desired number, the women's comments are mainly out of concern for their own health and well-being. Some men suggested that such a woman that wants to act contrary to the husband's desire should be divorced, as she might use some means to frustrate the desire of the husband. Others even suggested that the woman merely wants to destabilise the house by not agreeing to the man's wish. The following are some quotes from the discussions:

"He should marry another wife that will give birth to more children for him" (Female, North, Rural).

"I will just have the number that I want and ask the man to get another wife to give him the others. You bear most of the children's responsibilities these days and even if you have the number that the man is insisting upon, does that guarantee that he will not marry another woman?" (Female, South West, Rural).

"The woman has to agree. If the woman does not agree, the man should have another wife to bear the remaining children. It boils down to the same thing: the woman wants to destabilise the house" (Male, South West, Rural).

"She means trouble, because she can follow a negative way to achieve what she wants. She can go to the hospital secretly to do something that will prevent her from conceiving. So the final solution is to divorce her and bring in another wife" (Male, North, Urban).

Few male discussants think that the couple should reach an agreement by the woman increasing her desired number while the man revises his desired number downward. Some other discussants feel that the woman should agree with the husband and have the number that he wishes but that the man must take adequate care of all the needs of the woman and the children. Few discussants suggested that the couple could adopt children to make up the number that the man wants. A male discussant from South East, Urban wondered whether given the present economic situation of the country, a sane man would want to have eight children? Below are some of the discussants' comments:

"They should reach an agreement. He should reduce the number of children he wants and she should add a little to the number she wants" (Male, North, Urban).

"The wife is under the husband and must respect him. The wife should agree with the man and the man should cater adequately for the woman and the children" (Male, South East, Urban).

"If the health of the woman can take it, then she should have the children" (Female South West, Urban).

"If the wife has health problem, they can adopt children to make up the number that the husband wants or the wife should agree for the man to marry another wife" (Male, South East, Urban).

"The husband should be advised that if anything happens to the wife in the process of satisfying him, he would be held responsible" (Male, South East, Urban).

"It should be checked whether the man is normal because the country is not good economically and he should not tempt God, so that he does not die early" (Male, South East, Urban).

Wife wants more

The opinions somewhat differ here from the situation where it is the man that wants more children. Persuasion and being ready to take on the responsibilities of the additional children seems to be the main options opened to the woman here. Basically, she is to have the number that the husband desires although a few suggested that the couples adjust their desires to meet halfway. Others feel that the woman simply wants to cause mayhem in the family and suggested sarcastically that she should go on to have the additional children for another man. One male discussant from the South West urban feels strongly that the woman should be sent packing as she can bring in another man's pregnancy into the house to achieve her end. A handful of discussants (including a female) even suggested getting the wife sort of sterilised secretly. Below are quotes from the discussions.

"In my view, she should be tactful and show him the importance of having many children, by so doing, she can have his attention and he might agree with what she wants" (Female, North, Urban).

"It might be that the man is considering his earning and that is why he decided to have no more children. So she should agree with what he wants in order to have a peaceful living" (Female, North, Urban).

"They should reach an agreement to resolve this. He should be patient and decide on having a little more on what he wanted and she should reduce the number she wants" (Female, North, Urban).

"I will not allow her to stay in my house and bring another pregnancy from outside" (Male, South West, Rural).

"She should go and have it for another man. The woman simply wants to destabilise the house. The man said he cannot afford it and she wants to behave contrarily" (Male, South West, Rural)

"If I want four and my wife wants eight, I will tell her right from the onset, to put it legibly in writing that after my four if she mistakenly have others, she will take care of

them by herself. The first four I will take care of, the other ones will be her babies though they will answer my name and it is okay the moment she signs" (Male, South West, Urban).

"In a situation like this, I will employ a Guidance Counsellor in order to counsel her" (Male, South West, Urban).

"The man can employ the services of a doctor to do something to his wife. Although the doctor can first advise the woman" (Female, South West, Urban).

8.7. CONCLUSION

The focus group discussion sessions show that the leaning of most of the couples towards smaller family size could be reversed with improvement in the standard of living and liquidity in the country's economy. This conclusion is informed by the fact that discussants clearly show that the large family size promoted by both culture and religion is mainly curtailed by the economic downturn in the country. This was aptly captured by the following quote from one of the discussants:

"It is the kind of job that one is doing that determines the number of children that one is going to have. If I have enough money, I will have many children even more than ten. But I will not be able to cater for them because the kind of job that I am doing does not permit me to have more than four" (Male, South West, Urban).

It equally raised some ethical issues regarding how individuals thwart the reproductive rights of their partners allegedly with the connivance of some health personnel.

The limitation of this part of the study is that the views and opinions of some of the discussants during the sessions could have been influenced by the need to be seen as being socially correct by their peers in the group.

CHAPTER 9

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

9.0. INTRODUCTION

In presenting this discussion, the various discussions in each of the result chapters (chapters four to eight) are brought together and fortified. The qualitative and quantitative findings on each of the objectives are integrated and located within this discussion to give a more comprehensive view of the findings as well as meaning to the findings. Whether the hypotheses proposed are proven or not by the findings is then examined. Following this, the disparity between the regions is put in the context of the history of the educational development of the country while the effect of political and socio-economic issues on the fertility trend, level and future trend is highlighted. The chapter concludes with a concise conclusion drawn from the findings as well as some policy and research recommendations.

9.1. DISCUSSION

This study examined fertility dynamics in Nigeria between 1990 and 2003 with a view to knowing whether and how socio-economic changes have affected it in the last couple of decades. The study examined the levels, trend, differentials and proximate determinants of fertility during the period. It specifically estimated the extent to which people have been able to implement their fertility preferences in the country as well as the contribution of this to fertility changes within the selected period. How couples' attitudes and preferences impact on each other towards achieving desired fertility preferences was

also examined. The socio-economic and microeconomics theories on fertility were used to guide the study. Some male variables were also incorporated into the microeconomic framework of fertility analysis to bring out the role of the males in fertility decision-making and eventual outcome.

The results of this study underscore the point that fertility transition has started in Nigeria. There was a general decline in the age specific fertility rates (ASFR) between 1990 and 2003 in all the age groups. This is reflected in the total fertility rate (TFR) for the country as a whole, which declined from 6.32 in 1990 to 5.82 in 2003 (Note that trend results are being interpreted here between 1990 and 2003 while keeping silent on the 1999 results because of the omission of births in the 1999 data, which resulted into an underestimate of current fertility. A more likely estimate of the TFR for the 5-year period preceding the 1999 survey is 6.0 births per woman as found through the indirect methods of estimation used in section 4.2.2 of chapter 4). The fertility trend across age groups follows the normal fertility pattern with a steady rise from age group 15-19, which peaks at age groups 25-29 and 30-34 and thereafter follows a downward trend. The estimates arrived at here as well as the pattern over time is similar to those given in the 1990, 1999 and 2003 Nigeria Demographic and Health Survey (NDHS) reports. The little difference is attributable to differences in the periods used. For example, the total fertility rate (TFR) for the 2003 NDHS was calculated for the three-year period before the survey while five-year period was used in this study for uniformity with the other two survey years.

The national average however masks large variations in the fertility levels between subgroups in the country. The women in the North generally have higher number of children than their Southern counterparts (although, there is some variation within the Northern and Southern regions too). This difference is marked in the early childbearing years. Fertility levels are also higher among rural residents compared to those in the urban areas. Substantial differences equally exist in the fertility levels of women by their level of education, with fertility being negatively associated with level of education. Adegbola (1987); Makinwa-Adebusoye and Feyisetan (1994) and Feyisetan and Bankole, (2002) also found these regional, residential and educational differentials in the national studies that they carried out in the country. Regional, residence as well as educational variations in fertility levels have also been reported in other parts of the world including Sub Sahara African countries (Mboup and Saha, 1998; Moultrie and Timaeus, 2002; APHRC, 2002).

Mean number of children ever born (CEB) declined over the survey period for respondents in age groups 15-19 and 20-24 and in the total sample of women from 3.20 in 1990 to 3.02 in 2003. A comparison of the past and current fertility also confirms that fertility has been on the decline.

Age at first and last births have been declining and the differentials between the two shows that the number of years spent in childbearing is decreasing. Percentage of never married women that were giving births was found to be increasing over time but at a level below six percent and with no identifiable educational or regional pattern. In 1990, only

1.1% of the total births were to never married women. These were 1.6% and 2.4% in 1999 and 2003 respectively. Births to never married women is taken as estimate of births that occurred outside marriage/union as the timing of the births to ever married women could not be determined (which could have happened when they were in a stable union). Although the percentage is increasing, the level of births outside marriage/union is quite low in the country. Teenage motherhood is equally declining both nationally and regionally and is relatively high among teenagers from the rural area and those with less than secondary level of education. This observed general trend and differential by education could be as a result of increased enrolment in schools while the rural-urban differential could be due to the quantum of opportunities open to the teenagers in the urban areas compared to the fewer opportunities in the rural areas. The negative association between education and onset of childbearing has also been shown by other studies (Pasarell S, 1995; Klepinger et al, 1995; Otterblad et al, 2001; Westoff, 2003; National Association of State Boards of Education, 2006).

The proportion of women that progress from one parity to another decreases as parity increases and no socially imposed optimum number of children (although there is a political four-child policy in existence) among the Nigerian women is observed. If there were, the ratios would have shown majority of the women progressing to that parity and a sharp drop in the proportion progressing to the next and other parities thereafter. Infact, 28.6, 29.5 and 30.4 percents of the respondents (who have ever had a child or pregnant at the time of the survey) had more than four children in the 1990, 1999 and 2003 surveys respectively. In addition to this, the proportion of women that progresses from parity four

to five in the total sample of women were 0.77, 0.74 and 0.78 in 1990, 1999 and 2003 respectively. See Table 4.2.8 and Appendix 9.

Apart from age of mother at birth of child, which has a positive association with median length of birth interval and the surviving status of preceding child (which is understandably shorter if the preceding child is dead), length of birth interval by type of place of residence, region, level of education, marital status, birth order and sex of preceding child shows no significant variation over the survey periods. Since no major differential is seen in the length of birth interval, the observed differential in actual fertility among the subgroups in the country could perhaps be explained by the difference in the ages at onset and stoppage of childbearing.

Age at first marriage remained between 16 and 17 over the years. This is lower for respondents from the rural compared to those from the urban; the North compared to those from the South and for those with less than secondary level of education compared to those with secondary and higher levels of education. In the total sample, age at first intercourse was 16 years in all the survey years. A monotonic increase was observed along the age groups especially in 2003 where it was 15 years for women aged 45-49 in 2003; 16 years in the age group 30-34 and 17 years in age groups 20-24 and 25-29. Respondents from the North and rural area however initiate sexual intercourse earlier and age at first sexual intercourse increases with level of education. The pattern in age at first intercourse is consistent with observed age at marriage (although, average of 16 years for age at first intercourse and 16/17 years for age at marriage might suggest that sexual

activity precedes marriage). Where age at marriage is early, age at first intercourse is bound to be at similar level and direction.

In the proximate determinant of fertility framework used in the analysis of this work, only marriage or recent sexual activity was used as proxy for factors governing exposure to intercourse. Although fecundity as well as the use and effectiveness of contraception were factored into the framework, factors affecting gestation and successful parturition were not. These exclusions in the framework as well as possible errors in the data (e.g. approximation of age at marriage and postpartum variables and incorrect reporting of sexual activity and contraception) have the potential of biasing the estimates of total fecundity or total potential fertility obtained. This perhaps explains the wide variation in these estimates.

Among the proximate determinants indices (using both Bongaarts and Stover's formulations), the index of postpartum insusceptibility has the greatest inhibiting effect, followed by that of marriage or sexually active, contraception and then sterility. A notable exception to this general order was found among women with tertiary level of education where the influence of the index of insusceptibility is a distant third except among the currently married in 2003 where it's inhibiting influence was the second. This could be accounted for by later age at union, higher prevalence of contraceptive practice and shorter duration of postpartum insusceptibility among this group of women. Other studies also found this order in the indices of proximate determinants (Gaisie, 1984; Ferry and Page, 1984; Mhloyi, 1984; Adegbola, 1987; Jolly and Gribble, 1993). However,

Odimegwu (1996) found the order of influence of the indices among the Igbo of the South East, Nigeria to be index of marriage, index of contraception and then that of insusceptibility. One of the reasons why the order of influence of these proximate determinants is still unchanged could be due to the low but increasing level of contraceptive uptake in the country. This order might however change in the near future as the gaps within and between the basic determinants are closing up leading to values of the indices being quite close in many cases.

In the Bongaarts model, the indices reduced total fecundity by 12.46 births in the total sample of married women in 1990; 8.90 births in 1999 and 9.45 births in 2003 while the indices jointly reduced potential fertility by 17.69 births in the total sample of sexually active women in 1990; 16.06 births in 1999 and 16.50 births in 2003 in the Stover's reformulation.

Although differences were found in the estimates of the indices of the proximate determinants derived through the Bongaarts model and its Stover's reformulation, an estimate (with its range) of total fecundity derived for the Bongaarts model using 35 years of reproductive life shows that the range overlaps with that given by Stover. This shows that the two formulations are quite close if the same reproductive time span is imputed. That the proximate determinants that have the most inhibiting effect on fertility and their order of importance are the same in both formulations perhaps lend credence to this conclusion.

Both the distant and immediate determinants of fertility were explored comprehensively by the focus group discussants on the themes on ‘how the desired number is achieved’ and ‘factors that hinder having the number or having more than the desired number’.

The number of children desired has been increasing over time although, this trend could have been dictated by the high percentage of non-numeric response in the 1990 survey. The desired number of children is positively related to age and number of surviving children while it is negatively related to education. Number of children desired is found to be lower among urban residents and respondents from the Southern part of the country and highest among currently married women. In the focus group discussion (FGD) sessions, the majority of the discussants believe that although the decision on the number of children is curtailed by religious and cultural beliefs, people should behave responsibly by having the number they can comfortably manage and cater for.

It is however evident from further discussion of the issue that people have been revising the number of children downward due to ‘supposed’ economic hardship in the country and the need to give quality education, training and care to the children. There was no consensus as to a specific number that people should have except in the South West where majority of the respondents mentioned four. This is however not obvious in the parity progression ratio of the quantitative analysis.

The focus group discussion on the reasons for the number of children desired also brought out the fact that their desires are strongly influenced by their perception of the

value attached to children as well as the costs and potential benefits of children. Among the Yoruba of South West Nigeria as in most ethnic groups in Nigeria, children validate marriage (Makinwa-Adebusoye and Feyisetan, 1994). Children also confer a special status on women who may be honoured for their role in perpetuating the lineage. For example, some Igbo communities honour women who have successfully borne ten or more children. This parity ten custom bestows on a woman a special honour as a member of a privileged class (Odimegwu, 1998; Edewor, 2001).

The extent, to which fertility preference is implemented, is generally high and increasing over the years in the total sample of married women with some variations in the sub groups. It is higher in the urban compared to the rural; increases with level of education, lowest in the North East and highest in the South West. The high level of the index is due to the high level of wanted fertility, which leaves little gap between wanted and observed fertility. Although the level of wanted fertility could have been affected by rationalization of births, fertility desire is generally high as attested to by the high percentage of women with four or more living children who still desire to have another (See Table 6.2). This was also confirmed in the focus group discussion sessions as the majority of the respondents show their preference for large family but for the economic constraint in the country. Desired family size is generally high in Sub-Saharan Africa and is put between six and nine per woman (World Bank, 1996).

In addition to estimating the index of preference implementation quantitatively, the theoretical aspect of the index that is determined by the net result of the costs of fertility

regulation and that of unwanted childbearing was explored qualitatively. For the cost of fertility regulation, the ways and means that is used to have the number of children desired was explored. Regarding what is done to achieve the desired number in situations where the tendency to have more is high, a number of strategies were mentioned. The discussants are very knowledgeable about the reducing effect of some postpartum variables on fertility, such as avoiding sex relations while breastfeeding and not menstruating until after weaning their babies. Some traditional and modern methods of abortion are also recognized and mentioned by few discussants but they were quick to add that the option is unlawful and a sin against God.

Controlling the rate of marrying by maintaining monogamous marriage was mentioned as one of the ways to having the desired number of children. For men that are unable to have up to the desired number however, having more than one wife is mentioned as an option to achieving their desire as well as adoption of children of close relatives. Lastly, the majority of the discussants believe that the best way to have the desired number and when they wish to have them is to consult medical practitioners (including family planning personnel) for ways and means of going about it.

The discussants were quite knowledgeable about both modern and traditional family planning methods and their availability. They discussed extensively about the social, economic and in particular the health costs of the methods as well as the obstacles to the use of the methods. These costs could have informed the psychological barrier to the usage of contraception by some of the discussants as well as the population in general (see chapter 8 for details).

The cost of unwanted childbearing was explored in this study as the 'positive and negative implication of an additional child'. This section validates the response to questions on pregnancy wantedness as people generally acknowledged the circumstance of the birth of additional child(ren) as accidental. The psychological, health, social and more frequently the economic costs were raised and discussed. The netting of the two costs to inform attitude and decision on fertility regulation, thereby, influencing the degree to which fertility preference is implemented is captured by this quotation, which is representative of the general opinion of the discussants:

"The main reason why women fear using contraceptive drugs and devices is due to the harmfulness of the drugs. Some of the ills they cause are more complicated or difficult to bear than the hardships of labour. Because for labour, once you deliver you have finished suffering. But if you get a problem as a result of using contraceptive drug or device, you continue suffering up to the end of your life, always going to hospital for treatment" (Female, North, Urban).

To examine the influence of the males on eventual fertility outcome, the fertility preference implementation indices among different categories of couples were estimated. The index was higher among discordant couples where the wives desire more children than the husbands compared to where the husbands desire more than the wives and also compared to the concordant couples. This implies that the wives who desire more children than the husbands achieve their fertility preferences more than those that have similar desires as their husbands or those that desire lesser than their husbands. This could have been what one of the focus group discussant meant when he said:

"In fact the husband only has power in his words, but in action the wife has more power than him since it is the wife that controls her body. She can be given contraceptive pills

and refuse to use it. Even where she agrees with her husband's want and inwardly she is against him, she will do whatever she wishes in practice" (Male, North, Rural).

However, the influence of the men comes to the fore where they desire more children than their wives. The extent to which the fertility preferences of the wives of these husbands are achieved is less than that of the women who desired more children than their husbands. Perhaps, they had to adjust their preferences upward to meet the husbands' demand (thereby decreasing the extent of achieving their individual preferences) while the other group of women used their influence (as the people directly in charge of reproduction) to achieve their desires.

The higher fertility preference implementation among discordant couples compared to the concordant ones is surprising and raises the question of whether agreement between couples implies equal inputs. This was further investigated by fitting logistic regression models of spousal influence on each other's family planning attitude and number of children desired. Overall, there was no evidence of the husbands having an upper hand in the number of children desired by the wives or on their attitude to family planning and vice versa. Some of the results suggest that the traditional control of couples especially that of husbands over the wives could be diminishing. For example, the logistic regression analyses show that both husbands' and wives' individual characteristics affect their spouses' desired number of children and family planning attitudes.

The general consensus among the focus group discussants is that the man as the religious and traditional head of the family has the larger input in whatever goes on in the house including decisions on contraception and number of children. Regarding the resolution of

unequal number of children wanted by a couple, the unequal power relation between the husbands and their wives came to light here as the majority of the discussants (both males and females) are of the opinion that the desire of the man is to be achieved basically through bringing in other wife/wives to make up for the outstanding number that the wife in the union is unable or refuses to have.

From the quantitative analysis, who has the upper hand in fertility regulation and outcome was not conclusive. However, information gathered from the qualitative study suggests that the wives in Nigeria are expected by religion and tradition to respect and concur almost all the time to the wishes and decisions of their husbands. Similar agreement on issues among couples therefore, does not mean equal input into the decision that informed that opinion but rather subsuming the opinion of the number two spouse under that of the dominant one.

It should however be noted that the amount of control men have over their wives vary from place to place, could change over time and could be influenced by several socio-economic and demographic factors. For example, in the South West, women enjoy some level of economic autonomy that gives them the opportunity to take certain independent decisions and participate more in decision-making as their contribution to the family resources increases (Oyediran, 2002). Bankole (1995) also reported that 'Yoruba women (of South West Nigeria) who have many children, especially sons, have more say than their husbands about whether or not they will have more children'. Hence, the norm of the man being the head of the house is not necessarily so in practice in all cases.

From all these results, making the case for the inclusion of the role of the males (through the use of their family planning attitude and desired fertility as proxy for their roles in fertility decision and outcome) in the theoretical framework is indeed right. The results show that both spouses are influential in fertility decision-making and outcome, hence, fertility models should build-in the male as well as the female inputs. The supply-demand framework (for the determinants of fertility) used was also well suited to and relevant in this study in that the observed fertility exceeds wanted fertility.

On theoretical front, the proximate determinant of fertility framework is well suited to the study. Almost all the factors mentioned in the FGD on 'how the desired number is achieved' and 'factors that hinder having the number or having more than the desired number' could be put into the blanket groups of background and proximate determinants of fertility by the proponents of the determinants of fertility framework except the issue of multiple births and the divine factor (God's will).

However, on practical ground, finding similar results using both the Bongaarts et al (1984) model and the Stover's reformulation (1998) put into question Stover's claim. In this study, age at first intercourse was found to be increasing; non-marital fertility (although marginally increasing) is below six percent while percentage of respondents that had experienced recent sexual activity declined from 77 in 1990 to 65 in 2003. This could have affected the Stover's reformulation in this population. It might be better suited

in a situation where age at first sexual intercourse is declining and the proportion sexually active is increasing.

Although, the same conclusion is arrived at when the two models are used, the Bongaarts et al model is better suited to the Nigerian data. This is because although the percentage of women that were married equally declined between 1990 and 2003 (but at a lower pace compared to the rate of decline of the recently sexual active population), over 90% of the women that had experienced recent sexual activity were married (See Table 5.4.1). This shows that a huge percentage of sexual activity in Nigeria takes place within union and marriage could still be reasonably used as a base for exposure to the risk of pregnancy.

The three preconditions for fertility decline as proposed by Coale (1973) namely: fertility must be within the calculus of conscious choice; reduced fertility must be advantageous (this is at the least perceived) and effective techniques of fertility reduction must be available (Makinwa-Adebusoye, 2001; Caldwell, 2001) are found in this study. The observed decline, although at the pace of the peculiar African transition is therefore not surprising.

9.2. CONFIRMATION OF THE HYPOTHESES

The first hypothesis proposed was that ‘the indices of marriage/sexual activity, postpartum insusceptibility and contraception (in that order) have the most inhibiting effect on fertility in Nigeria. This is on the assumption that the recent socio-economic

changes in the country has a declining effect on the percentage of women in marriage while sexual activity (in particular non-marital) is increasing; that contraceptive usage is increasing and that period of postpartum amenorrhea is declining. From the analysis of the proximate determinants of fertility in this study, the indices of postpartum insusceptibility, marriage/sexual activity, contraception and sterility have the greatest inhibiting effect (in that order) on fertility in Nigeria. The proximate determinant indices found in this study and their order of importance remain the same as the ones identified by previous studies. Although all the changes proposed that could have effect on fertility and hence its proximate determinants as a result of the recent socio-economic changes in the country were found to be true, the index of marriage/sexual activity did not displace the index of postpartum insusceptibility as expected. From this result, this hypothesis is not confirmed.

The second hypothesis states that 'the degree of fertility preference implementation is higher in the south than in the North, higher among urban residents compared to the rural residents and it increases as the level of education increases. This assumes that the enormous internal diversity across the country will equally be manifested in the extent by which people across the divide in the country have been able to achieve their fertility preferences. From the results of this study, the extent to which fertility preferences are achieved (index of preference implementation) is higher in the urban area compared to the rural and increases with level of education. Regarding the regions, the index is lower in the North East compared to the South East and South West, lower in the North West compared to the South West but only lower in the North West compared to the South

East in 1999 only. Altogether, the index could be said to be higher in the South compared to the North. This result confirms the second hypothesis proposed.

The third hypothesis was that 'the extent to which the couples with similar desired number of children are able to implement their fertility preferences is higher than among the discordant couples'. This was based on literature that shows that the fertility desires of both marriage partners are important predictors of the couple's fertility outcome. Disagreement among couples regarding the number of children wanted has also been shown to reduce the likelihood that either spouse will achieve individual preferred fertility (Bankole, 1995; Thompson 1997).

The total sample of discordant couples was able to implement their fertility preferences better in 1999 when compared to the concordant ones while the opposite is the case in 2003. When the total sample of discordant couples is disaggregated (into couples where the husbands desired more children than the wives and a second group where the wives desired more than the husbands), the index of fertility preference implementation is higher among couples where the husband desire more children compared to the concordant couples in 1999 but lower than the concordant couples' in 2003. It is equally higher among couples where the wives desire more children than among the concordant ones in 1999 and both classes of couples were at the same level in 2003.

For the wives in discordant union where the husbands desired more children, it could be that they had to adjust their preferences upward to meet the husbands' demand (thereby

decreasing the extent of achieving their own individual preference) while the wives that desired more children than the husbands could have used their influence as the people directly in charge of reproduction to achieve their ends. One probable reason for the relatively low achievement of fertility preference among the wives in the concordant group is that the decision that informed the desired number of children was imposed upon them. The hypothesis could not be proven in this study especially in view of this last result.

The fourth hypothesis was that: the extent to which people are able to implement their fertility preferences is increasing and playing an increasing (a more positive) role in fertility changes in Nigeria. This is based on the fact that there has been a general decline in fertility worldwide, which has substantially closed the gap that exists between actual and wanted fertility. This is expected to dilute the overwhelming effect and contribution that wanted fertility has on fertility changes and hence, an increase in the role, played by the level of fertility preference implementation.

In the total sample of married women, total fertility rate declined by 0.5 births per woman between 1990 and 2003. These births translate into contributions of 86, 8 and 6 percents by wanted fertility, natural fertility and the index of fertility preference implementation respectively. This shows that the role of the index of preference implementation in the observed fertility change in the country is increasing although minimal thereby, confirming this hypothesis.

The fifth hypothesis was that: the husbands have more influence on their wives' family planning attitude and desired number of children than the wives have over the husbands'. This is on the premise that Nigeria is a male dominated society where the man decides matters affecting the family and society in general.

From the twenty-four logistic results using the quantitative data, there was no evidence of the husbands having an upper hand in the number of children desired by the wives or on their attitude to family planning and vice versa. However, the focus group discussion theme on decision-making in the households concerning the use of contraceptives and number of children shows that the men make the larger share of the decisions. Other studies have also found that husbands have greater control over couples' reproductive decision-making and behaviour than the wives (Ezeh, 1993; Bankole and Singh, 1998; DeRose, Nii-Amoo Dodoo and Patil, 2002; DeRose, 2003). The degree to which this edge that they have in decision-making is translated into reality was however not conclusive. What is certain is that both partners are influential.

These influences are shown in the estimation of fertility preference implementation among different categories of couples. The extent to which the discordant couples where the husbands desire more children than the wives were able to implement their fertility preferences was lower than among those where the wives desire more than the husbands. It could be that the first group of wives had to adjust their preferences upward to meet the husbands' demand (thereby decreasing the extent of achieving their individual preference) while the latter group could have used their influence as the people directly in

charge of reproduction to achieve their ends. This shows that both partners are influential. This hypothesis could therefore not be proven conclusively.

In conclusion, two of the hypotheses were confirmed, one was not while the other two could not be proven conclusively.

9.3. AN INSIGHT INTO THE SOCIO-ECONOMIC AND DEMOGRAPHIC DIFFERENTIALS

The differentials in fertility measures exhibited by the various sub population in particular between the North and the South is deeply rooted in the history of socio-economic development as well as some cultural practices in Nigeria. From the outset, Nigeria's ethnic, regional, and religious tensions were magnified by the significant disparities in economic and educational development between the south and the north with consequences felt in Nigeria's political life ever since. The Western (formal) education brought by the Christian missionaries did not meet with open reception from the people of the north who are predominantly Muslims because of the fear of their children and wards getting converted into Christianity. In addition to this, there was an existing system of Quranic education whereby children compulsorily go to Quranic School, which parents see as obligatory and were therefore not ready to sacrifice for any other form of education.

Nigeria was granted full political independence in October 1960, as a federation of three regions (northern, western, and eastern) under a constitution that provided for a parliamentary form of government. Under the constitution, each of the three regions

retained a substantial measure of self-government. This, with the method of ruling in the North (even up till today), which is that of total obedience to the ruler further perpetuated the existing disparities within the region as the masses were unable to break into the circle and the benefits preserved for the Northern political elite who lived at the expense of their people.

Although Nigeria has had a National Policy on Education since 1976, it has not been implemented effectively and efficiently due to rapid population growth, insufficient political will, a long period of undemocratic governance, and poor management of scarce resources. Women and girls have been mostly affected by these negative factors. The national literacy rate for females is 56% compared to 72% for males, and in certain states the female literacy, enrolment and achievement rates are much lower. For example, girls' net enrolment in Sokoto (in the North West) is 15% compared to 59% for boys (Unicef, nd).

Some cultural practices also contribute to this state of affairs. For example, some parents keep their daughters out of school due to misinterpretation of the tenets of Islamic religion. Early marriage and teenage pregnancy have also militated against girls' attendance, retention and achievement in schools. Also, women are made to accept the superiority of men in all aspects of socio-cultural life from childhood and as a result of this gender stereotyping, women have lower participation in socio-economic as well as political life of the country. All these no doubt have profound effect on fertility issue in addition to others between the Northern and Southern regions of the country.

It is worthy to make mention of the urban/rural differentials in the country too. About 60% of the population live in rural areas. Rural to urban migration is however significant with urbanization rate estimate put at 3.7% per annum. It is projected that the proportion of the urban population will be 42% in 2010 and 46% by 2020 (Federal Government of Nigeria, 2004).

9.4. EFFECT OF POLITICAL AND SOCIO-ECONOMIC EVENTS ON FERTILITY LEVELS AND TREND

On the national scene, the country has had many political and socio-economic issues with profound impact on its people in the last twenty-five years. Nigeria seems to be in permanent political transition since the mid 1980's -starting with the military incursion of December 1983 until democratic elections were successfully held but won by a former military ruler in February 1999.

With the tactics employed by the military to hold on to power in the 1990's, real political transition was muted and national priorities were diverted away from growth to stability and the consolidation of political power in the ruling elite. Constitutionalism, rule of law and democratic institutions became virtually non-existent. The enjoyment of limited freedoms as well as the misplaced priorities of the political leadership translated into lower standards of living for the people. Nigeria at this period became classified among the poorest countries of the world, not in terms of absolute riches but ranked in order of human development index, with majority of the people living on less than one US dollar a day.

On the Nigerian socio-economic scene, the country has had its own share of the structural and economic reforms that were almost uniformly applied with varying success across all less developed countries in the 1980's by the World Bank and the International Monetary Fund (IMF). These reforms have meant a leaner public service, reduced public subsidies and higher prices for public utilities through the commercialisation, rationalization and privatisation programmes. In the process, the populace have been faced with higher prices of public goods and services while retrenchment in both public and private sectors has been widespread. However, the private enterprises have begun to assume increasing importance in the running of the economy, with greater efficiency and improved quality of products and service delivery to show for this.

The move from military dictatorship to democratic governance has led to sustained reform of the polity. Significantly, the country has moved further into true federalism especially in the area of revenue allocation among the constituent units of the federation. This has also accelerated development at the local level with a positive impact on the lives of the people at the grassroots. The recent remarkable deal with the Paris Club, which discounted repayment of US$30 billion of the total debt stock, has had the effect of freeing up more resources to tackle poverty reduction programmes.

The Information Communication and Technology (ICT) sector has also witnessed tremendous growth in new investment as well as employment and wealth creation. The development of a technology village is in progress while the indigenous manufacture of

computer systems has intensified. In addition, the highly successful licensing of mobile phone operators in 2001 has opened up the economy to more efficient means of communication with millions of new jobs created in the sector. These have had a positive effect on the earnings and the living standards of the people across the entire country.

In the public sector arena, specific reforms in the areas of monetization of pensions and allowances have also been undertaken lately. The immediate impact has been to put more money into the pockets of public servants as well as pump more money into the economy through the government pension contributions in cash.

The effect of these happenings on the socio-economic and political scenes is that people had to adjust their way of life and living to the economic realities of the time. A number of changes took place in peoples' life including the revision downward by most, of the number of children to have. However, the recent economic reforms in the country are translating into better living conditions for the people and more liquidity in the economy. Will this reverse the downward trend in fertility in the country?

9.5. CONCLUSION

Fertility transition is on in Nigeria but substantial differentials exist among socio-demographic groupings and people are increasingly able to achieve their fertility preferences. The decline could be traced to decline in wanted fertility due mainly to the declining economic situation in the country. The focus group discussion sessions however show that the leaning of most of the couples or individuals towards smaller family size could be reversed with improvement in standard of living and liquidity in the country's economy.

This conclusion is informed by the fact that discussants clearly show that the large family size promoted by both culture and religion (both of which have profound influence on the lives of the people in the country) is mainly curtailed by the economic downturn in the country. Smith (2004) also arrived at a similar conclusion thus "In Nigeria, as fertility decline takes shape, having people remains a dominant value and a rational strategy, producing the contradictions that characterize peoples' experience of demographic fertility transition". Also, despite the socio-economic changes, which have taken place in the period, the proximate determinants remain the same nationally and across region. One would have expected changes in the southern regions due to the relatively higher socio-economic development of the area.

The economic downturn in the country certainly jump-started the fertility decline observed in the country. Sustained economic growth and an understanding of the

relationship between population and development is key to continued fertility decline in the country.

9.6. RECOMMENDATIONS

It is confirmed in this study that wanted and actual fertility are declining in Nigeria. This is however some distance away to achieving the 1988 four-child population policy of the government. The closing up of the differential between wanted and actual fertility has translated into increased achievement of fertility preferences in the country. However, the reason behind the decline in wanted fertility and hence outcome is mainly economic rather than any noble concern for the implication of population growth on development in the country.

Age at first marriage has remained between sixteen and seventeen years over a long period of time in the country while the age at first sexual intercourse is about sixteen years. The number of years women spend in childbearing is found to be declining in the country. This is a result of decline in the age at first birth and a more rapid decline in the age at last birth over time.

While the reduction in the number of years spent in child bearing (although, it may not necessarily translate into a reduction in the number of children born) is welcome as a result of decline in the number of older women in active childbearing, the increasing entrance of women under the age of eighteen years is worrisome. This will impact negatively on school enrolment and retention as well as on the health of the women since

it is recognised that women under the age of eighteen years is one of the four groups of women with higher risk of morbidity and mortality during pregnancy and childbirth (FGN, 1988; Eggleston, 1999; Ibisomi, 2004; Ibisomi and Odimegwu, 2007).

The inhibiting effect of contraception on fertility in the country is quite low. The percentage of women using contraception, although increasing, is still very low to reflect any meaningful contribution to fertility decline. It is not surprising therefore that the leading proximate determinants of fertility remain the same in the country after 20 years of a similar study.

The disparities that exist between the urban and the rural and between the North and the South also need to be urgently addressed, as this in the long run will impact negatively on the demographic and human development aggregate measures of the country.

Having highlighted the important issues raised by this study that require urgent policy and programme attention, an examination of the national policy on population for development, unity, progress and self-reliance of 1988 and the 2004 national policy on population for sustainable development shows that almost all the issues were articulately marked for action. The problem therefore seems to be in translating the policies into practicable programmes of action that will culminate into an improvement and eventual resolution of the issues. The consequences and implications of rapid population growth need to be considered more seriously in the national effort to achieve sustainable development.

It is therefore recommended that:

1. Greater effort and funding is allocated into the education of the girl-child. Programmes to this effect should include those that will sensitise the girls to the consequences of early sexual debut, marriage and childbearing. The importance of education as a weapon to health and socio-economic independence should also be emphasized. Programmes should also be designed to improve women's economic independence in general.
2. The existing family planning programme is strengthened and expanded to ensure that all couples and individuals who want them have uninterrupted access to a reasonable range of effective contraceptive methods at affordable prices. Special note should also be made to make the services available and accessible to that segment of the population that may not be able to afford the services. Efforts should also be made in getting the women who approve the use of contraceptives to practise and to get those who do not approve to do so and even practise.
3. The family planning drugs and devices is properly regulated especially, those supplied by commercial outlets. This is of great importance as side effects, as a result of (improper) use of some contraceptive devices purchased from these outlets, was fingered as one of the obstacles to the use of contraceptives.
4. The involvement of men in reproductive health programmes and care should be enhanced. This might improve attitude to use and uptake of contraceptives in households.

There are a number of research issues emanating from this study.

The focus group discussions brought out the fact that a number of obstacles to the utilization of contraceptives exist. While some were grounded in myths and misinformation, some were obviously genuine. A wide range of traditional (indigenous) methods of contraceptives also came to light. Some of the discussants especially from the North were also of the opinion that they are better than the modern methods as they have no side effects.

The higher fertility preference implementation among discordant couples compared to the concordant ones is surprising. While the results among the discordant couples show that both partners are influential, that of the concordant couples raises the question of whether agreement between couples implies equal inputs. The focus group discussions findings also show that as far as decision-making is concerned, the male has the upper hand. In practice however, this could not be confirmed.

Not identifying people who have achieved their preferred family size and those who have not and conducting in-depth interview with them to gain further insight into the issue is a limitation in this study. This is because, it was noticed that the discussants discussed along the ideal line not necessarily what happens in their households. Hence, the views and opinions of some of the discussants during the sessions could have been influenced by the need to be seen as socially correct by their peers in the group. The fertility

preference implementation results among the different categories of couples also show that a gap exists between what is seen as ideal and practise.

Not using the hazard model in the estimation of parity progression could have limited the result of the tempo and quantum of fertility in the study. Also, excluding respondents that gave non-numeric responses to the question on desired number of children from analysis of 'spousal influences over each other's fertility desire' did not enable a more comprehensive examination and interpretation of the logistic regression models derived thereof.

It is therefore specifically recommended that:

1. The obstacles to utilization of the family planning methods should be explored comprehensively by the use of both qualitative and quantitative data.
2. The traditional methods of contraception are explored more comprehensively and at local units to be able to identify a wider range of contraceptives. The nature, prevalence of usage and efficacy or otherwise of these methods equally need to be explored. This can inform policies and programmes on their development and usage.
3. Further exploration is carried out into the fertility preference implementation of couples especially those with similar desires to provide greater insight into the context of those decisions.
4. Further exploration is carried out on spousal influences on each other's fertility desires and behaviour. There is especially the need to further analyse the role

couples play individually and collectively in achieving their fertility preferences, especially against the background of the prevalent traditions and emerging modern perception of family settings. Efforts should be made in the exploration to include the use of contraception and the influence of the third parties (parents, parents-in-law, social groups and so on) in the models.

5. The respondents that gave non-numeric responses to the question on desired number of children are included in the analysis of 'spousal influences over each other's fertility desires using multinomial logistic regression analysis or any other appropriate method.
6. The hazard model is used in estimating the parity progression ratios to confirm the trend and tempo of fertility estimated using the conventional method.
7. New indirect estimation techniques are developed or the existing ones improved upon. While some of the indirect methods of estimation used in this study yielded estimates that could be taken to a reasonable extent as acceptable adjustments of the observed values, they became erratic, dissimilar to the observed and inconsistent with reality (especially when sample size is small) when the data is broken down into sub groups. Also the techniques were developed between late sixties and early eighties and a number of contemporary issues, top of which is HIV/AIDS that has effect on fertility levels were not factored into their derivation.
8. Further studies using both qualitative and quantitative techniques be undertaken on different aspects of fertility dynamics in the Northern part of the country that, to date, has had rather sparse body of documentation compared to the rest of the

country despite its consistently dominant population. The FGD undertaken in this study has been an eye opener of some sort and such studies should be sustained for a further glimpse into the population dynamics of this major part of the country.

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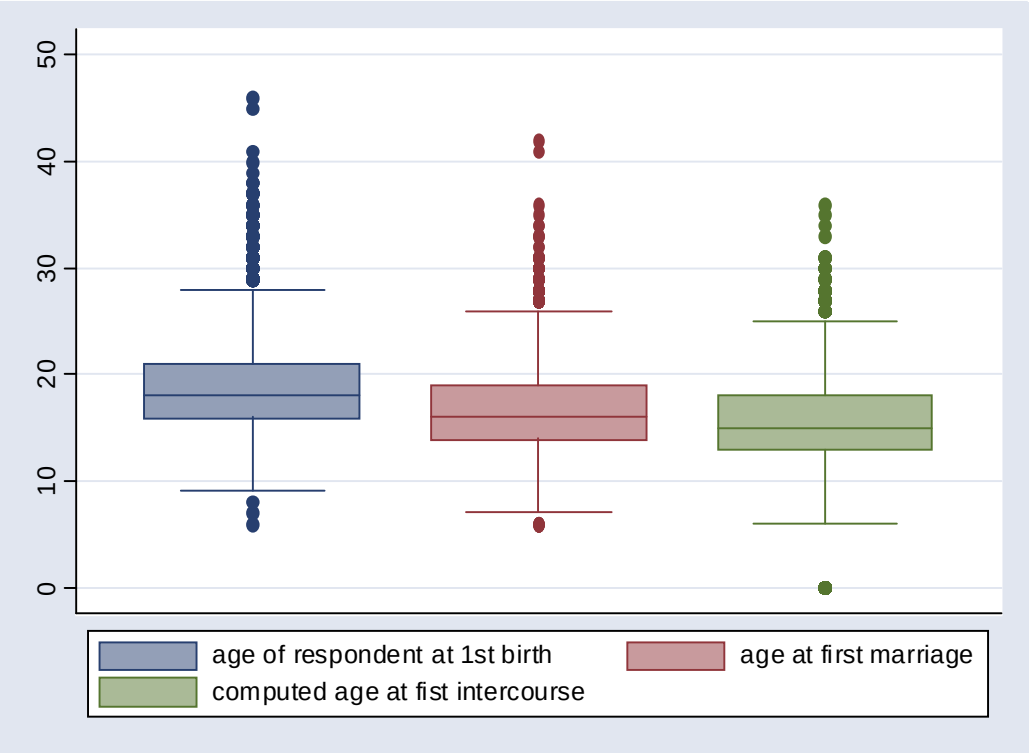
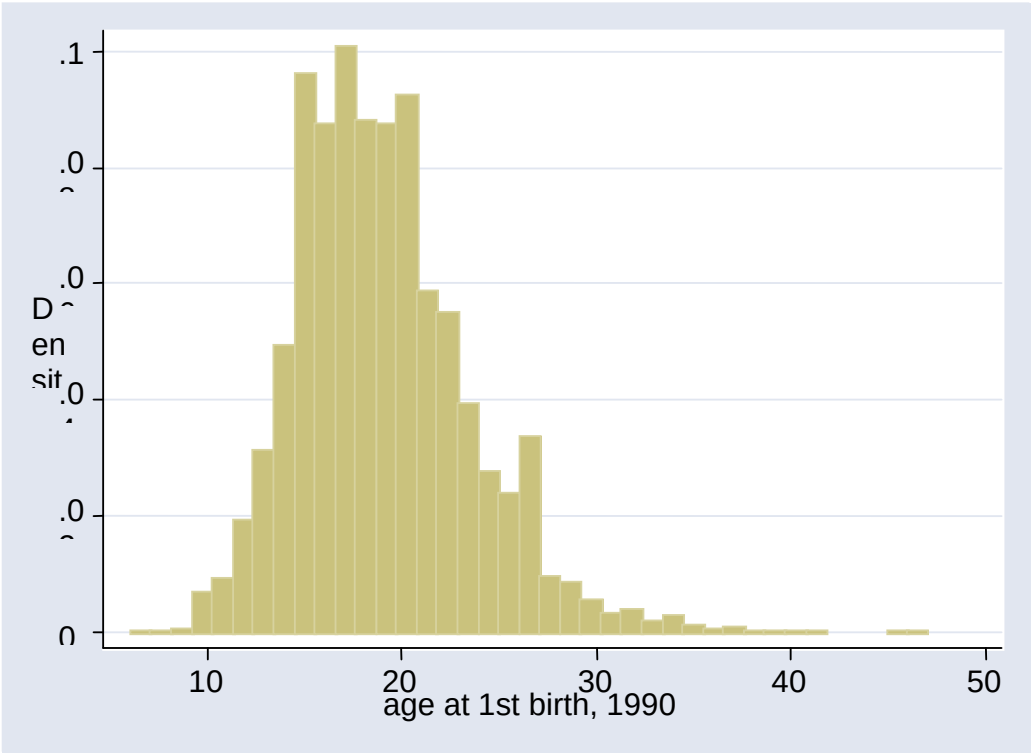
APPENDICES

APPENDIX 3a : NORMAL DISTRIBUTION TESTS

1990



Age of respondents at first birth, first marriage and first intercourse, NDHS 1990.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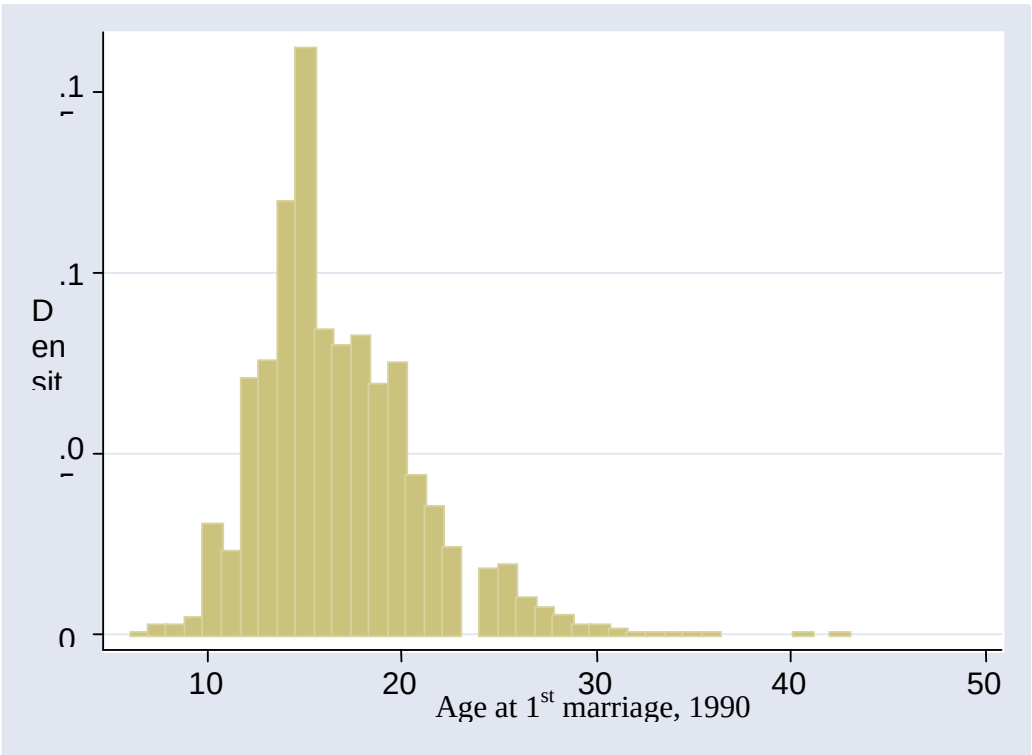
age at 1st birth, 1990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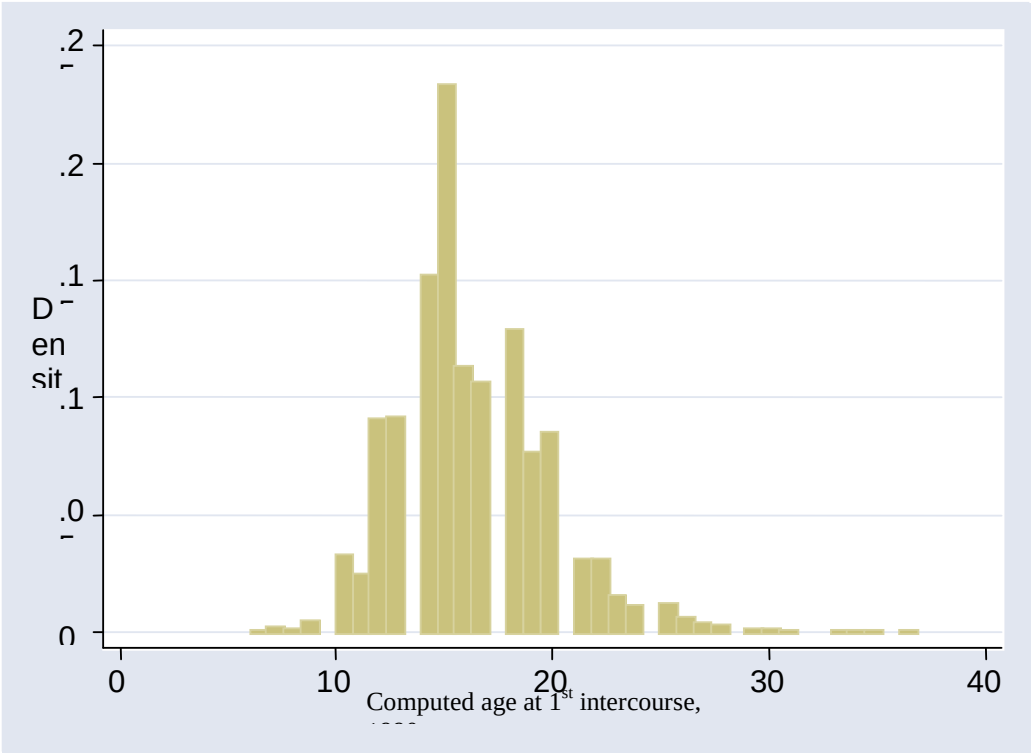
Age at 1st marriage, 1990



Age of respondent at 1st birth, NDHS 1990

Percentiles		Smallest		
1%	11	6		
5%	13	7		
10%	14	8	Obs	6477
25%	16	9	Sum of Wgt.	6477
50%	18		Mean	18.87046
		Largest	Std. Dev.	4.374358
75%	21	40		
90%	25	41	Variance	19.13501
95%	27	45	Skewness	.915987
99%	32	46	Kurtosis	4.644435

Age at first marriage, NDHS 1990

Percentiles		Smallest		
1%	10	6		
5%	11	6		
10%	12	6	Obs	7080
25%	14	6	Sum of Wgt.	7080
50%	16		Mean	16.71201
		Largest	Std. Dev.	4.052554
75%	19	35		
90%	22	36	Variance	16.42319
95%	24	41	Skewness	.7303356
99%	28	42	Kurtosis	3.891658

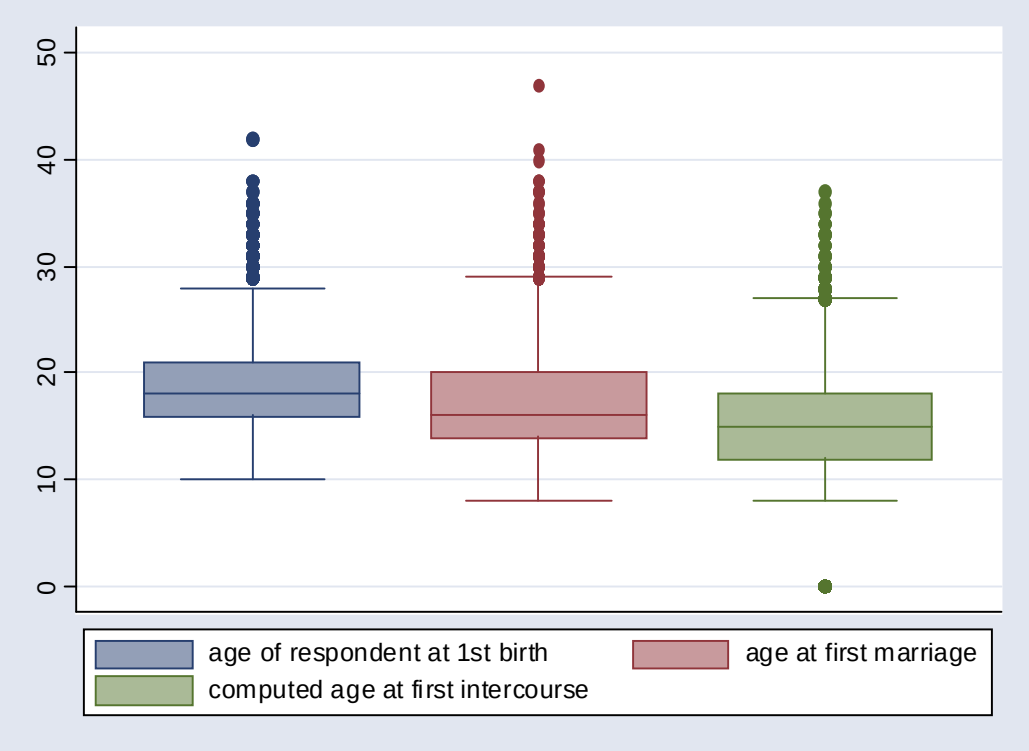
Computed age at fist intercourse, NDHS 1990

Percentiles		Smallest		
1%	10	6		
5%	11	6		
10%	12	6	Obs	7753
25%	14	6	Sum of Wgt.	7753
50%	15		Mean	16.18135
		Largest	Std. Dev.	3.446125
75%	18	33		
90%	20	34	Variance	11.87578
95%	22	35	Skewness	.7276795
99%	26	36	Kurtosis	4.258605

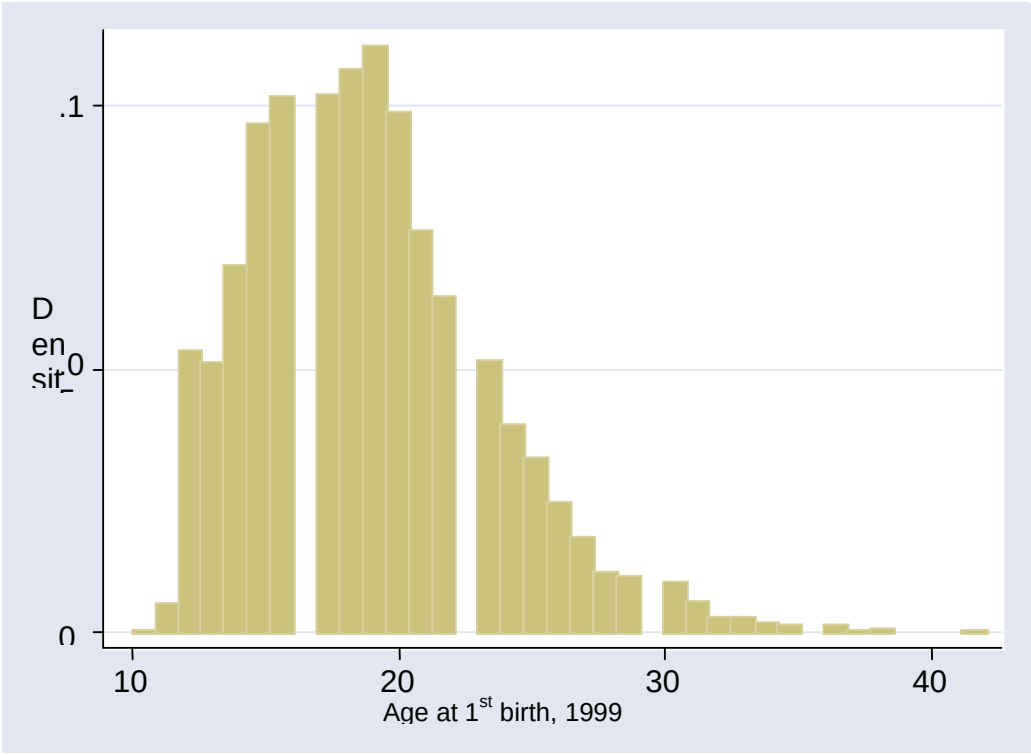
Skewness/Kurtosis tests for Normality, age at first birth, age at first marriage and age at first sexual intercourse, NDHS 1990.

			------- joint ------	
Variable	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
v212	0.000	0.000	.	0.0000
v511	0.000	0.000	.	0.0000
agfstint	0.000	0.000	.	0.0000

1999



Age of respondents at first birth, first marriage and first intercourse, NDHS 1999.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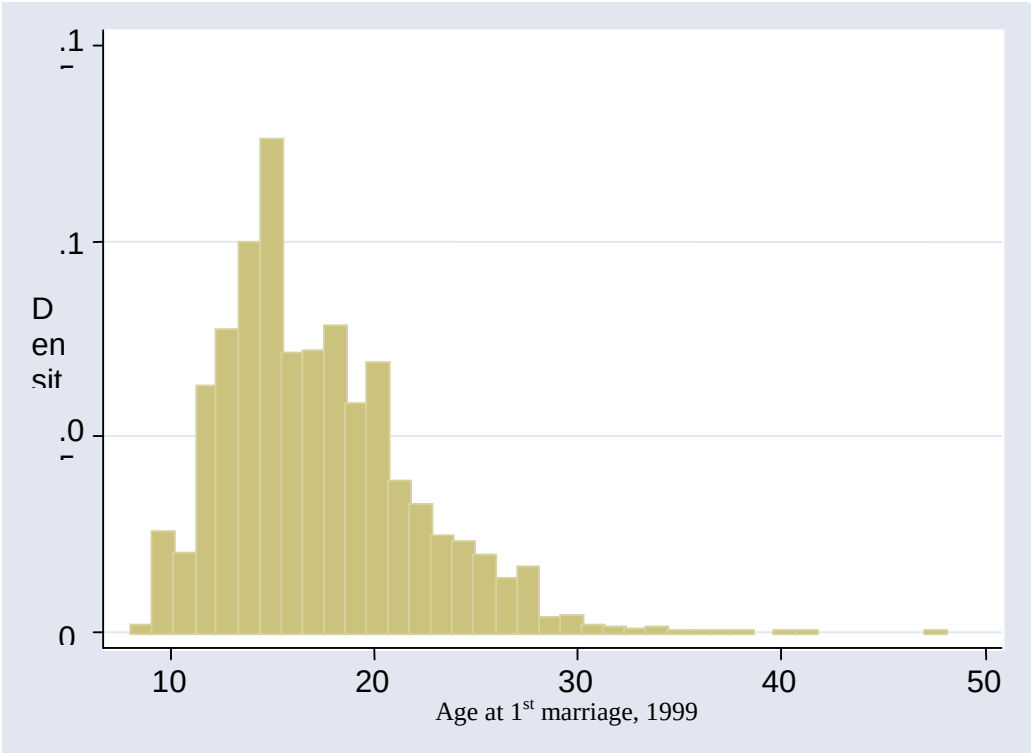
Age at 1st birth, 1999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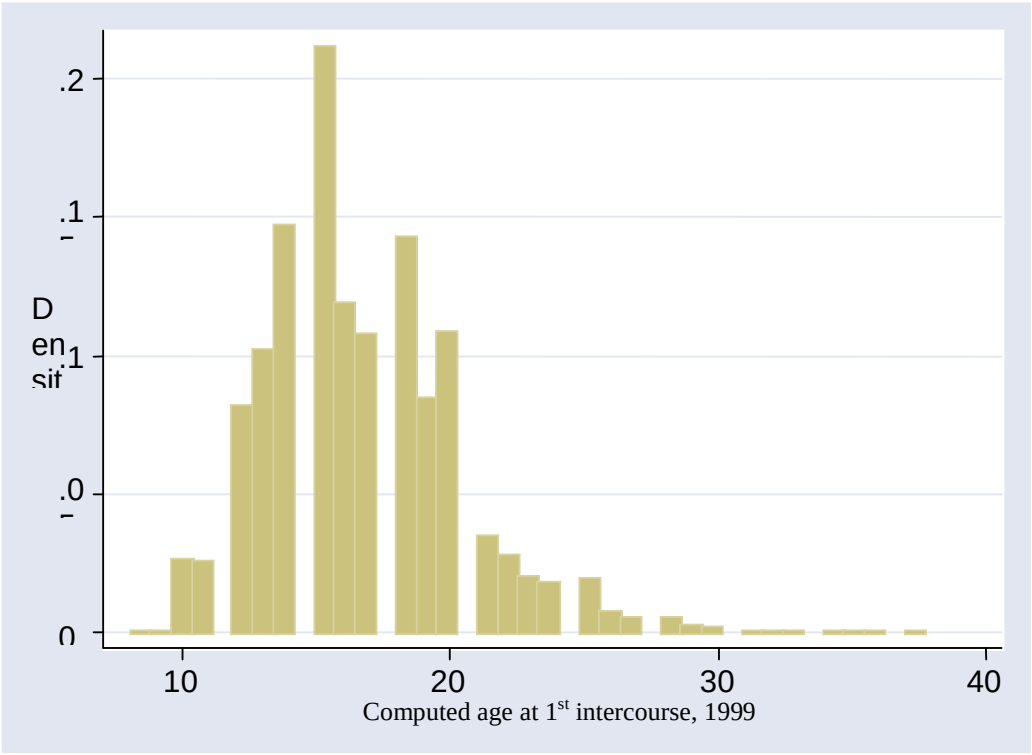
Age at 1st marriage, 1999



Age of respondent at 1st birth, NDHS 1999

Percentiles		Smallest		
1%	12	10		
5%	12	10		
10%	14	11	Obs	5618
25%	16	11	Sum of Wgt.	5618
50%	18		Mean	18.86401
		Largest	Std. Dev.	4.430222
75%	21	38		
90%	25	38	Variance	19.62687
95%	27	42	Skewness	.7957266
99%	32	42	Kurtosis	3.897689

Age at first marriage, NDHS 1999

Percentiles		Smallest		
1%	10	8		
5%	11	8		
10%	12	8	Obs	6081
25%	14	8	Sum of Wgt.	6081
50%	16		Mean	17.16346
		Largest	Std. Dev.	4.422162
75%	20	38		
90%	23	40	Variance	19.55551
95%	25	41	Skewness	.973823
99%	30	47	Kurtosis	4.477633

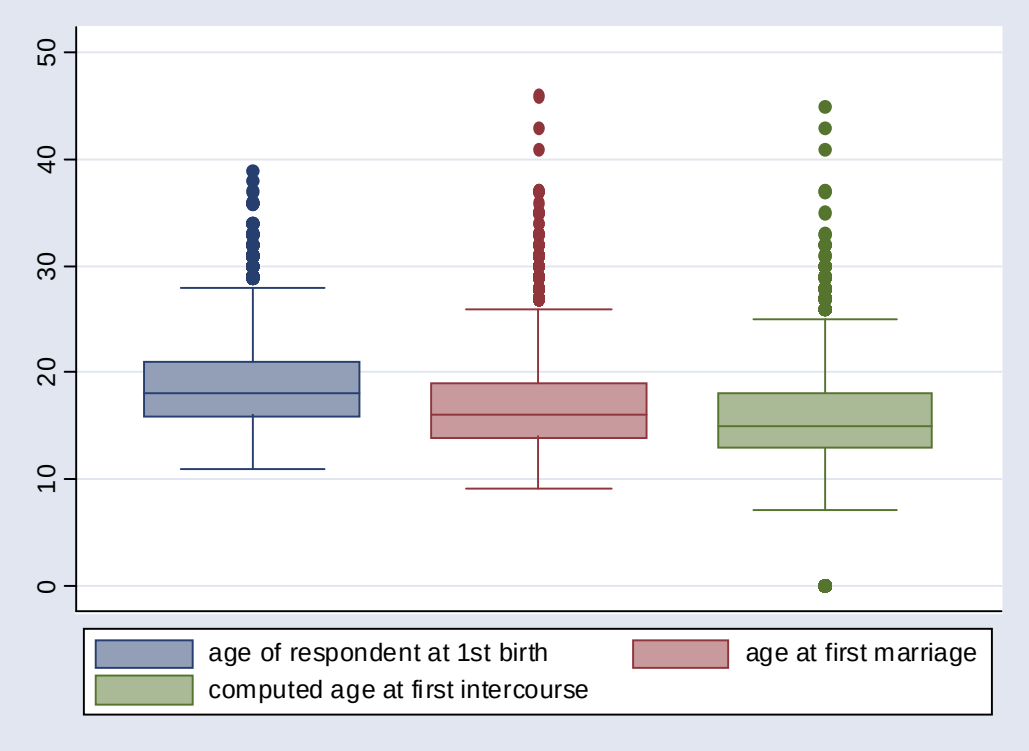
Computed age at first intercourse, NDHS 1999

Percentiles		Smallest		
1%	10	8		
5%	12	8		
10%	12	8	Obs	6762
25%	14	9	Sum of Wgt.	6762
50%	16		Mean	16.60278
		Largest	Std. Dev.	3.629145
75%	19	35		
90%	21	35	Variance	13.17069
95%	23	36	Skewness	.9075472
99%	28	37	Kurtosis	4.506205

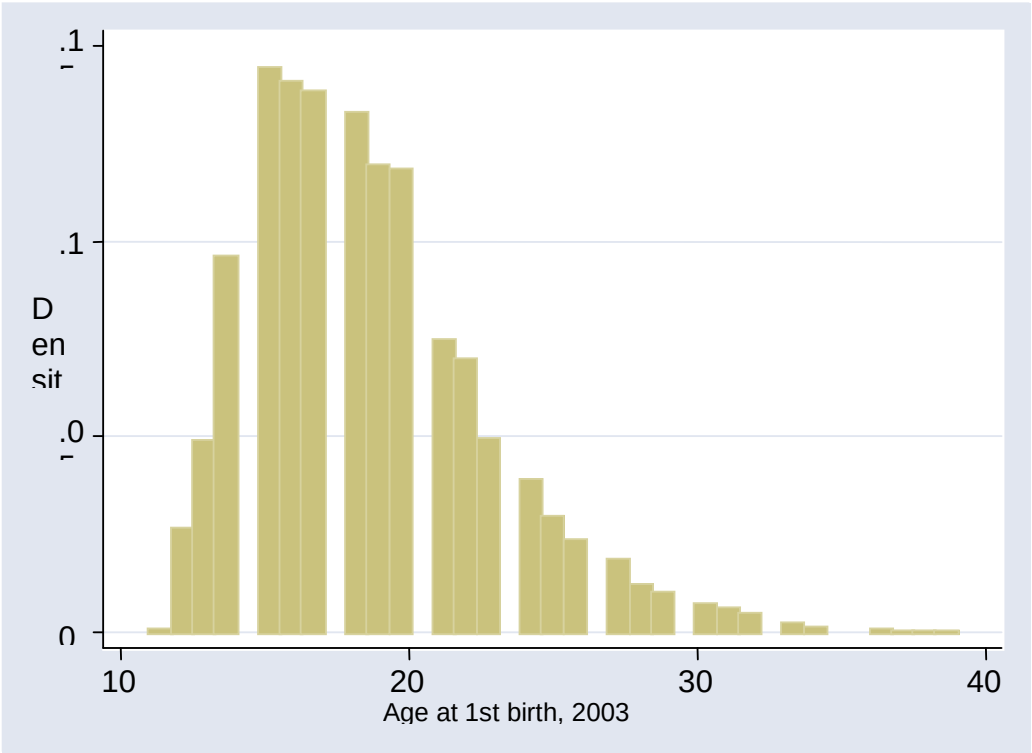
Skewness/Kurtosis tests for Normality, age at first birth, age at first marriage and age at first sexual intercourse, NDHS 1999.

			------- joint ------	
Variable	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
v212	0.000	0.000	.	0.0000
v511	0.000	0.000	.	0.0000
agfstint	0.000	0.000	.	0.0000

2003.



Age of respondents at first birth, first marriage and first intercourse, NDHS 2003.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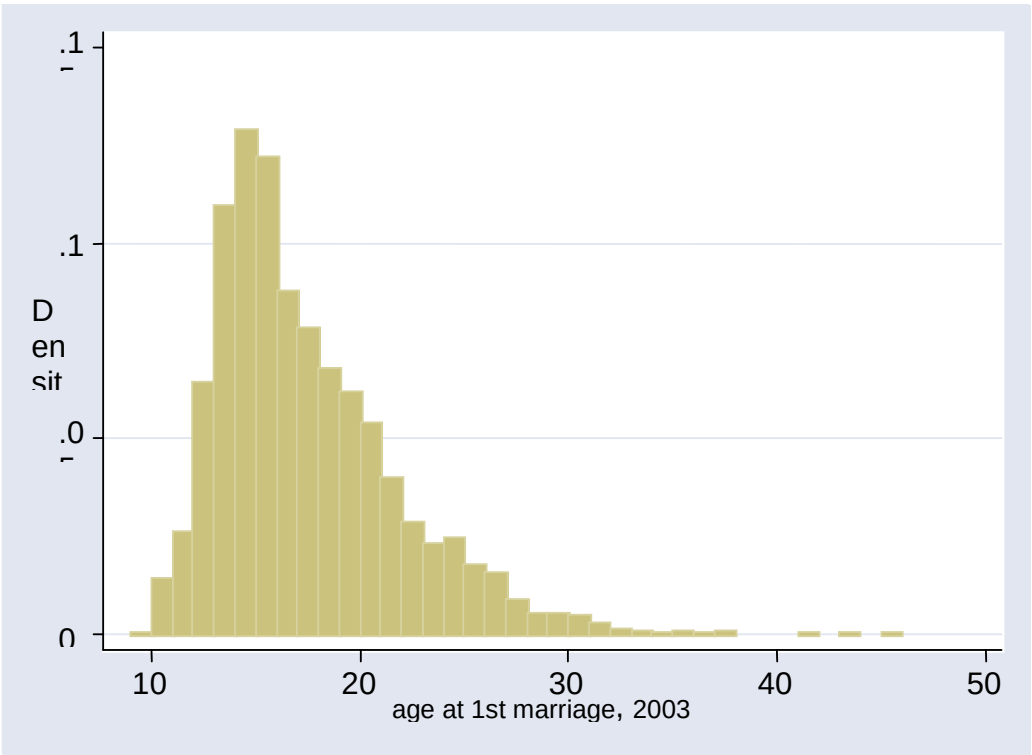
Age at 1st birth, 2003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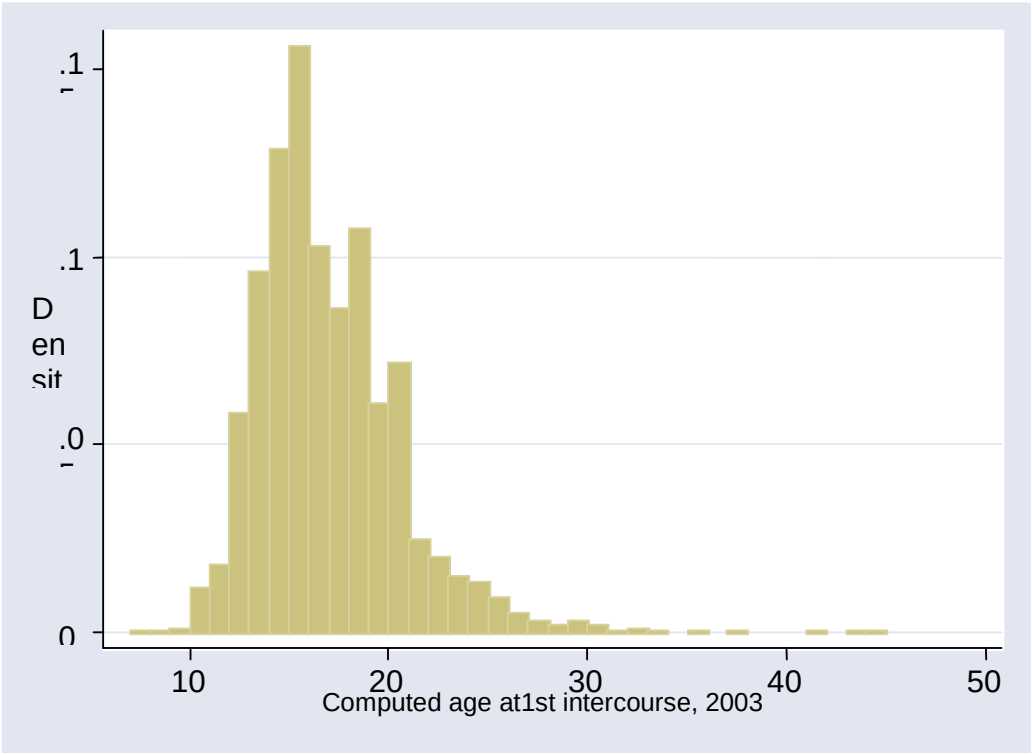
age at 1st marriage, 2003



Age of respondent at 1st birth, NDHS 2003

Percentiles		Smallest		
1%	12	11		
5%	13	11		
10%	14	11	Obs	5111
25%	16	12	Sum of Wgt.	5111
50%	18		Mean	18.62512
		Largest	Std. Dev.	4.068439
75%	21	36		
90%	24	37	Variance	16.5522
95%	26	38	Skewness	.9599709
99%	31	39	Kurtosis	4.101126

Age at first marriage, NDHS 2003

Percentiles		Smallest		
1%	10	9		
5%	12	10		
10%	12	10	Obs	5533
25%	14	10	Sum of Wgt.	5533
50%	16		Mean	16.92445
		Largest	Std. Dev.	4.344119
75%	19	37		
90%	23	41	Variance	18.87137
95%	25	43	Skewness	1.150783
99%	30	46	Kurtosis	4.76802

Computed age at first intercourse, NDHS 2003

Percentiles		Smallest		
1%	10	7		
5%	12	8		
10%	13	8	Obs	6330
25%	14	9	Sum of Wgt.	6330
50%	16		Mean	16.42338
		Largest	Std. Dev.	3.480468
75%	18	37		
90%	20	41	Variance	12.11366
95%	23	43	Skewness	1.168303
99%	27	45	Kurtosis	6.252439

Skewness/Kurtosis tests for Normality, age at first birth, age at first marriage and age at first sexual intercourse, NDHS 2003.

			------- joint ------	
Variable	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
v212	0.000	0.000	.	0.0000
v511	0.000	0.000	.	0.0000
agfstint	0.000	0.000	.	.

APPENDIX 3b: FOCUS GROUP DISCUSSION PROTOCOL

ORGANIZATION

1. **A small town will be used for urban and a typical village as rural in each of the regions. This is to ensure, as much as possible that it is actually the views of the indigenous population that is being sought.**
2. Recruitment of experienced and matured (preferably middle aged people that the participants will be comfortable discussing with) moderator & note-taker (2 males, 2 females). The males (one as moderator and the other as note taker) to handle the male discussions and the females to handle the females'.
3. Training of personnel recruited - the researcher will brief the personnel and go through the procedure as well as the field guide with them. The moderator and note taker must be conversant with the interviewing techniques and understand the importance of and be able to guide the discussions to gather the required information.
4. With the assistance of the contact person in the community, the researcher and trained personnel then recruit FGD participants from the community. During recruitment, information on age, type of place of residence and education level would be collected to determine the suitability of the people for the discussion after which they would be invited for the session.
5. Contact person in the region is to advise on best day, time and where to hold the discussion according to the schedule and culture of the people (as well as the gift to give to participants). A public place with seats or rented chairs will be secured for the sessions.

ACTUAL SESSION

- Seats to be arranged in a circular fashion for equal inclusion of all.
- Moderator to introduce self and team and to explain role of each person, welcome participants and ask them to introduce themselves by their aliases.
- The purpose of the session and its benefit will be explained. The participants will also be informed that the session will be recorded on tape and the reason for this emphasized. Their right to voluntary participation and withdrawal if they so wish will also be mentioned. The informed consent forms will be signed or thumb printed by all participants and reason for it (signing/thumb printing) explained to them (requirement of school). The basic characteristics forms will also be filled at this time or any other time. The importance of this form will be explained, as it is only to be able to describe the basic characteristics of the participants in the research write-up.
- The moderator as well as the note taker or any other person in the team will be assigned to note and record body language of the participants. This may include nodding of heads, dragging of feet, hissing… when certain issues are being discussed. The meaning of such signs in that community (as meaning of body language differs from culture to culture) will be sought.
- The discussion then commences. The sessions for males and females can go on concurrently since they are to be handled by different set of personnel.

AFTER SESSION

The team meets and listens to tape along with what is written by note-taker. Other non-verbal communication/gestures during session will also be discussed and written. Discussions to be written (transcribed) verbatim by hand in local language translated into English and typed out (preferably on a computer so as to have the soft copy).

GUIDE FOR FOCUS GROUP DISCUSSIONS (WOMEN)

Perhaps we should begin by allowing each person to introduce herself by her nick name.

1. In some communities, people might be expected to have a particular number of children. In some countries, for instance, no more than two children may be seen as desirable for most people. What would you say is the number of children people are expected to have in this community?
   If they don't bring it up, PROBE on:
   - Reasons for this particular number? Why don't people just have as few or as many children as they are able to have? If the answer is non-numerical or funny, probe for/the number
   - What would having less than this number mean for a woman/man/family? What about having more than this number? (i.e.: How does having/not having this number affect one's life?)

2. Still on this issue of the number of children that people in this community are expected to have,

   - what are some of the things people can do to have the number they want
   - what are some of the things that might prevent one from having less than this number or more?
   - What are some of the things that might encourage/facilitate one's having this number of children?

3. A woman living in this community wanted only four children, but she is now pregnant with her fifth child. What can she do? What can husbands do? And what can relatives do to ensure that she does not have a sixth child?
   If they don't bring it up, PROBE on:
   - What are the pros and cons of each strategy mentioned?

- What are the most- and least-recommended strategies? Reasons? – Moral judgement.

4. There is another situation whereby the woman wants 4 but the husband wants eight children. How should the couple handle this situation?

5. What if it is the woman that wants 8 and the man 4? How can they resolve this?

6. Generally, people have an idea of the number of children they want but they often have more. When this happens what can be said about the circumstances of the conception? **Probe –** unwanted, accidental etc.?
   - What are the implications (both positive and negative) of having one more child? **Probe**: emotional, monetary, social as well as health costs.

Finally, as couples, men and their wives usually engage in certain decisions in the smooth running of the households. For example, what to buy or do and who pays for it. Who gives the larger input into such decisions? Probe for other decisions made in the house. If they do not mention it, ask about decision on contraceptive use and number of children.

CONCLUSION

We are getting to the end of this discussion. Do you have any final thoughts or comments? We thank all of you for your time and for your willingness to share your thoughts with us. Hopefully, what you have shared today will help others in achieving their fertility preferences in the long run. We appreciate your assistance.

NOTE: A version of this was used for the Males.

PARTICIPANTS' INFORMATION SHEET

Good Morning/Afternoon.

My name is Latifat Ibisomi. I am a student at University of the Witwatersrand, South Africa.

I am conducting a research to examine the extent to which people in Nigeria are/have been able to achieve their fertility preferences.

Though the study has no direct benefit to you as an individual, your views will help in understanding the value of children from your perspective; the number of children people want; how far; as well as the ways and means used to achieve the number. What you think should be put in place to help people achieve the desired number of children is also important. All these should help the government and other programme managers to formulate appropriate programmes to assist people to that end.

Participation in the discussion is voluntary and you are free to withdraw your participation at any time during the session without any recourse. The discussion will take about one and a half hours.

CONSENT FOR RECORDING THE SESSION

I will also like to seek your kind permission to record the proceeding on tape. The recording is to ensure that all that is discussed during the session is captured. The tape would be kept strictly confidential and would be destroyed immediately after transcription.

INFORMED CONSENT SHEET

The purpose of the discussion as well as my rights regarding participation have been read and interpreted to me. I have understood this and consent voluntarily to participate in the discussion.

Signature/Thumb print and Date

BASIC CHARACTERISTICS OF FGD DISCUSSANTS

Age ……

Sex ……

Place of Residence ……

Highest educational level ……..

Occupation ……..

Religion ……..

Number of Children …….. Boys …….. Girls …….

……

BASIC CHARACTERISTICS OF FGD DISCUSSANTS

Age ……

Sex ……

Place of Residence ……

Highest educational level ……..

Occupation ……..

Religion ……..

Number of Children …….. Boys …….. Girls …….

……

BASIC CHARACTERISTICS OF FGD DISCUSSANTS

Age ……

Sex ……

Place of Residence ……

Highest educational level ……..

Occupation ……..

Religion ……..

Number of Children …….. Boys …….. Girls ……

APPENDIX 3d: CALCULATION OF MYER'S INDICES

Myer's index for the 1990 female NDHS data.

Terminal digit	starting at 20	30	weights		Blended 1*3 + 2*4	Population % distributn	Deviation from 10	Absolute deviation
0	1986	1353	1	9	14163	26.14257	16.14	16.14
1	405	176	2	8	2218	4.094064	-5.91	5.91
2	619	289	3	7	3880	7.161843	-2.84	2.84
3	430	180	4	6	2800	5.16834	-4.83	4.83
4	455	215	5	5	3350	6.18355	-3.82	3.82
5	1491	788	6	4	12098	22.33092	12.33	12.33
6	411	169	7	3	3384	6.246308	-3.75	3.75
7	424	175	8	2	3742	6.907118	-3.09	3.09
8	533	254	9	1	5051	9.323317	-0.68	0.68
9	349	164	10	0	3490	6.441967	-3.56	3.56
Total	7103	3763			54176			56.95
Summary index (total absolute deviation divided by 2)								28.475

Myer's index for the 1999 female NDHS data.

Terminal digit	starting at 20	30	weights		Blended 1*3 + 2*4	Population % distributn	Deviation from 10	Absolute deviation
0	1531	950	1	9	10081	20.56633	10.57	10.57
1	404	180	2	8	2248	4.586164	-5.41	5.41
2	585	308	3	7	3911	7.978864	-2.02	2.02
3	404	185	4	6	2726	5.561336	-4.44	4.44
4	435	208	5	5	3215	6.558949	-3.44	3.44
5	1238	650	6	4	10028	20.45821	10.46	10.46
6	480	232	7	3	4056	8.27468	-1.73	1.73
7	409	189	8	2	3650	7.446396	-2.55	2.55
8	554	266	9	1	5252	10.71465	0.71	0.71
9	385	208	10	0	3850	7.854418	-2.15	2.15
Total	6425	3376			49017			43.48
Summary index (total absolute deviation divided by 2)								21.74

Myer's index for the 2003 female NDHS data.

Terminal digit	starting at 20	30	weights		Blended 1*3 + 2*4	Population % distributn	Deviation from 10	Absolute deviation
0	1256	703	1	9	7583	17.05923	7.06	7.06
1	407	188	2	8	2318	5.214731	-4.79	4.79
2	579	313	3	7	3928	8.836697	-1.16	1.16
3	469	243	4	6	3334	7.500394	-2.50	2.50
4	388	188	5	5	2880	6.479044	-3.52	3.52
5	982	499	6	4	7888	17.74538	7.75	7.75
6	449	217	7	3	3794	8.535241	-1.46	1.46
7	415	202	8	2	3724	8.377764	-1.62	1.62

8	551	293	9	1	5252	11.81526	1.82	1.82
9	375	205	10	0	3750	8.436256	-1.56	1.56
Total	5871	3051			44451			33.24
Summary index (total absolute deviation divided by 2)								16.62

Myer's index for the 1999 male NDHS data.

Terminal digit	starting at 20	30	weights		Blended 1*3 + 2*4	Population % distributn	Deviation from 10	Absolute deviation
0	490	393	1	9	4027	23.01537	13.02	13.02
1	123	73	2	8	830	4.74367	-5.26	5.26
2	205	134	3	7	1553	8.875807	-1.12	1.12
3	162	103	4	6	1266	7.235526	-2.76	2.76
4	132	94	5	5	1130	6.45825	-3.54	3.54
5	397	264	6	4	3438	19.64908	9.65	9.65
6	158	92	7	3	1382	7.898497	-2.10	2.10
7	136	87	8	2	1262	7.212665	-2.79	2.79
8	158	87	9	1	1509	8.624336	-1.38	1.38
9	110	68	10	0	1100	6.286792	-3.71	3.71
Total	2071	1395			17497			45.33
Summary index (total absolute deviation divided by 2)								22.665

Myer's index for the 2003 male NDHS data.

Terminal digit	starting at 20	30	weights		Blended 1*3 + 2*4	Population % distributn	Deviation from 10	Absolute deviation
0	381	244	1	9	2577	17.34	7.34	7.34
1	147	74	2	8	886	5.96	- 4.04	4.04
2	223	126	3	7	1551	10.44	0.44	0.44
3	165	90	4	6	1200	8.08	-1.92	1.92
4	145	86	5	5	1155	7.77	-2.23	2.23
5	326	208	6	4	2788	18.76	8.76	8.76
6	147	91	7	3	1302	8.76	-1.24	1.24
7	122	60	8	2	1096	7.38	-2.62	2.62
8	149	84	9	1	1425	9.59	-0.41	0.41
9	88	53	10	0	880	5.92	-4.08	4.08
Total	1893	1116			14860			33.08
Summary index (total absolute deviation divided by 2)								16.54

APPENDIX 3e: CALCULATION OF AGE RATIOS.

Calculation of Age Ratios (1990).

		Ratio	Deviation from 100	Absolute deviation
15-19	1678			
20-24	1682	100.558	0.56	0.56
25-29	1658	105.2476	5.25	5.25
30-34	1386	104.1583	4.16	4.16
35-39	948	89.97153	-10.03	10.03
40-44	827	104.3753	4.38	4.38
45-49	602			
Total				24.38
Mean				4.88

Calculation of Age Ratios (1999).

	Female				**Male**			
		Ratio	Deviation from 100	Absolute deviation		Ratio	Deviation from 100	Absolute deviation
15-19	1774				513			
20-24	1528	95.04458	-4.96	4.96	315	79.47855	-20.52	20.52
25-29	1521	108.8762	8.88	8.88	361	105.7617	5.76	5.76
30-34	1142	93.96599	-6.03	6.03	348	105.7751	5.78	5.78
35-39	983	104.7974	4.80	4.80	278	96.30485	-3.70	3.70
40-44	689	92.52462	-7.48	7.48	240	100.6993	0.70	0.70
45-49	562				197	91.48607	-8.51	8.51
50-54					209	118.5255	18.53	18.53
55-59					123			
Total				32.15				63.5
Mean				6.43				9.07

Calculation of Age Ratios (2003).

	Female				**Male**			
		Ratio	Deviation from 100	Absolute deviation		Ratio	Deviation from 100	Absolute deviation
15-19	1749				453			
20-24	1464	96.12607	-3.87	3.87	441	107.561	7.56	7.56
25-29	1356	108.1915	8.19	8.19	336	95.36424	-4.64	4.64
30-34	940	91.14415	-8.86	8.86	280	102.5641	2.56	2.56
35-39	798	98.39704	-1.60	1.60	203	88.38897	-11.61	11.61
40-44	695	98.76836	-1.23	1.23	206	107.2917	7.29	7.29
45-49	618				167	98.81657	-1.18	1.18
50-54					134	94.1452	-5.85	5.85
55-59					126			
Total				23.75				40.69
Mean				4.75				5.81

APPENDIX 4a: BRASS P/F RATIOS

Brass P/F ratio, NDHS 1990

Age interval	Pi	fi	Φ	K	F	P/F	Adj fi
17	0.29	0.12	0.0000	2.383998	0.29	0.99	0.12
22	1.34	0.25	0.6170	2.898253	1.34	1.00	0.25
27	2.88	0.31	1.8655	3.039716	2.80	1.03	0.31
32	4.52	0.28	3.3945	3.087254	4.25	1.06	0.28
37	5.56	0.19	4.7800	3.205317	5.40	1.03	0.19
42	6.18	0.11	5.7450	3.411762	6.11	1.01	0.11
47	6.57	0.08	6.2830	4.051238	6.63	0.99	0.08
		1.34					1.34
		6.71					**6.70**

Brass P/F ratio, NDHS 1999

Age interval	Pi	fi	Φ	K	F	P/F	Adj fi
17	0.25	0.08	0.0000	2.173527	0.18	1.43	0.09
22	1.12	0.20	0.4030	2.871483	0.96	1.16	0.23
27	2.51	0.23	1.3815	3.025741	2.07	1.21	0.26
32	3.93	0.25	2.5220	3.089629	3.30	1.19	0.29
37	5.25	0.17	3.7785	3.208286	4.32	1.21	0.20
42	5.94	0.10	4.6280	3.418887	4.96	1.20	0.11
47	6.35	0.02	5.1070	4.081518	5.21	1.22	0.03
		1.05					1.21
		5.23					**6.07**

Brass P/F ratio, NDHS 2003

Age interval	Pi	fi	Φ	K	F	P/F	Adj fi
17	0.23	0.10	0.0000	2.260393	0.23	1.01	0.10
22	1.1	0.23	0.5060	2.883717	1.16	0.95	0.22
27	2.7	0.32	1.6465	3.031859	2.60	1.04	0.30
32	4.24	0.30	3.2245	3.092902	4.15	1.02	0.28
37	5.77	0.21	4.7190	3.212378	5.38	1.07	0.19
42	6.43	0.11	5.7465	3.428706	6.11	1.05	0.10
47	6.99	0.03	6.2790	4.123251	6.41	1.09	0.03
		1.29					1.22
		5.37					**6.08**

APPENDIX 4b: GOMPERTZ ESTIMATES OF TFR

Relational Gompertz technique's TFR estimates

1990

Births	Women	ASFR	MCEB	Pi/TF	TFR adj
207	1678	0.1234	0.29	0.0419	6.92
420	1682	0.2497	1.34	0.2165	***6.19***
507	1658	0.3058	2.88	0.4438	6.49
384	1386	0.2771	4.52	0.6594	6.85
183	948	0.1930	5.56	0.8373	6.64
89	827	0.1076	6.18	0.9567	6.46
51	602	0.0847	6.57	0.9964	6.59

1999

Births	Women	ASFR	MCEB	Pi/TF	TFR adj
143	1774	0.0806	0.25	0.0348	7.18
299	1528	0.1957	1.12	0.1855	***6.04***
347	1521	0.2281	2.51	0.3965	6.33
287	1142	0.2513	3.93	0.6118	6.42
167	983	0.1699	5.25	0.8032	6.54
66	689	0.0958	5.94	0.9428	6.30
14	562	0.0249	6.35	0.9946	6.38

2003

Births	Women	ASFR	MCEB	Pi/TF	TFR adj
177	1749	0.1012	0.23	0.031	7.40
334	1464	0.2281	1.1	0.188	***5.86***
428	1356	0.3156	2.7	0.412	6.55
281	940	0.2989	4.24	0.635	6.68
164	798	0.2055	5.77	0.824	7.00
74	695	0.1065	6.43	0.953	6.75
19	618	0.0307	6.99	0.996	7.02

Tertiary level of education, never married and currently married TFR estimates, NDHS 1990.

Tertiary

Births	Women	ASFR	MCEB	Pi/TF	TFR adj
0	10	**0.0001**	0	0	#DIV/0!
1	49	0.0204	0.16	0.5157	***0.31***
12	71	0.1690	0.79	0.9504	0.83
12	51	0.2353	2.57	0.9966	2.58
0	21	**0.0001**	4.05	0.9999	4.05
0	8	**0.0001**	5.88	1	5.88
0	8	**0.0001**	**5.88**	1	5.88

Never married

Births	Women	ASFR	MCEB	Pi/TF	TFR adj
11	1079	0.0102	0.014	0.0882	0.16
6	461	0.0130	0.065	0.6346	***0.10***
2	135	0.0148	0.23	0.8992	0.26
1	13	0.0769	0.85	0.9774	0.87
0	9	**0.0000**	2.89	0.9968	2.90
0	3	**0.0000**	5.67	0.9999	5.67
0	1	**0.0000**	**5.67**	1	5.67

Tertiary

Births	Women	ASFR	MCEB	Pi/TF	TFR adj
188	573	0.3281	0.79	0.1208	6.54
403	1185	0.3401	1.83	0.3354	***5.46***
500	1468	0.3406	3.13	0.5401	5.80
377	1327	0.2841	4.58	0.7144	6.41
182	889	0.2047	5.59	0.856	6.53
86	724	0.1188	6.2	0.9567	6.48
45	530	0.0849	6.61	0.9955	6.64

NOTE: The TFR of the second or third age group is recommended to be taken as representative of the actual levels of the total fertility rate (Arriaga, 1994).

APPENDIX 9:

Proportion of Women that Progress from Parity Four to Five, NDHS, 1990, 1999 and 2003.

	1990	1999	2003
Age group			
15-19	-	-	-
20-24	0.25	0.29	0.22
25-29	0.57	0.54	0.51
30-34	0.76	0.69	0.77
35-39	0.83	0.77	0.85
40-44	0.91	0.86	0.91
45-49	0.92	0.89	0.89
Residence			
Urban	0.74	0.71	0.77
Rural	0.79	0.75	0.78
Region			
North East	0.74	0.74	0.80
North West	0.77	0.72	0.79
South East	0.81	0.80	0.79
South West	0.76	0.70	0.69
Education			
None	0.80	0.75	0.82
Primary	0.76	0.77	0.77
Secondary	0.60	0.67	0.67
Tertiary	0.52	0.59	0.62
Marital Status			
Never married	0.82	0.92	0.33
Currently married	0.77	0.74	0.78
Formerly married	0.82	0.74	0.77
Total	0.77	0.74	0.78