BREASTFEEDING IN NIGERIA: PATTERNS, CORRELATES AND FERTILITY EFFECTS.

BY

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DECLARATION

I, James Oluwakayode Ajayi, do hereby declare that this work, with the exception of acknowledged quotations and ideas was written by me and contains a true record of interpretation of data collected in the Nigeria Demographic and Health Survey conducted by the Federal Office of Statistics between April and October 1990, that this work has never been previously published nor has it been presented for a degree elsewhere, that I am responsible for any shortcomings contained therein.

12/8/95
Date

James Oluwakayode Ajayi.

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ABSTRACT

Using information obtained from 8,781 women aged between 15 and 49 years, who were successfully interviewed during the Nigeria Demographic and Health Survey, this study analyzes the patterns, correlates and fertility effects of breastfeeding in Nigeria. The study examines the main factors that are associated with breastfeeding behaviour and estimates the mean duration of any and full breastfeeding for the country and various subgroups.

A large proportion of mothers in the country are found to initiate breastfeeding and substantial proportion continue breastfeeding beyond 12 months after birth. However, the pattern of breastfeeding initiation reveals that over 40 percent of mothers avoided feeding of colostrum, thereby denying their babies of the first 'immunization' which is provided by the colostrum.

Despite the long duration of breastfeeding, most children are given supplementary foods at an early age. It is almost universal in the country to give plain water to children currently being breastfed regardless of how young the child is. Exclusive breastfeeding is practised by less than 1 percent of currently breastfeeding women.

Logistic regression on current status breastfeeding information shows a range of influences associated with any and full breastfeeding continuation. Maternal education, urban residence and use of contraception have significant negative effects on any breastfeeding continuation. Utilization of modern health care facilities, measured by assistance at delivery by

medical personnel is negatively associated with breastfeeding continuation. Northern residence increases the chance of continuing breastfeeding. The study also reveals that maternal education, urban residence and work status show expected significant negative impact on full breastfeeding continuation. Northern region residence, in contrast to Southern residence is associated with increased likelihood of full breastfeeding.

The study also establishes that the major impacts of breastfeeding on fertility work through postpartum amenorrhea. Amenorrhea is the principal path through which breastfeeding affects postpartum sexual abstinence. Consequently, postpartum infecundability due to breastfeeding and postpartum sexual abstinence is the most important suppressor of fertility in the country. A decomposition of the inhibiting effect of postpartum infecundability shows that postpartum amenorrhea averts 6 births while postpartum sexual abstinence averts less than 2 births per woman.

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CHAPTER I

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

During the last one hundred and fifty years, the world's population has been growing faster than at any time in history. Human society had existed for over a million years before the number of people in the world reached one billion, which it did around 1830. Another one billion was added by 1930, implying that what previously took about a million years to attain was accomplished in one century. In another thirty years, it reached three billion, and then only fifteen years for still another (Haupt and Kane, 1985; Jian, 1981:25). In 1975, the world's population was close to 4 billion and by the year 1992, the world's population had reached 5.4 billion. If this trend persists, the world's population would exceed the fantastic level of 1 trillion by the year 2300.

The characteristics of population growth during the twentieth century are indeed unique in world history. The world entered the century with less than 2 billion people and is projected to leave it with a little over 6 billion (Haupt and Kane, 1985). As at 1992, the world's population doubling time was reported to be about 41 years. While the population doubling time for developed countries was about 148 years, developing countries' population was expected to double in only about 34 years (Green, 1992).

The demographic scenario in Nigeria is not too different from what obtains in other developing countries. Nigeria, according to the 1991 provisional census results, had a population of 88.5

million (National Population Commission, 1992:8). This figure, though much lower than various projections based on the 1963 census figure, makes the country the most populous in Africa. There is at present a consensus among researchers and policy makers as to the urgency of the need to make birth control popular and check the rate of population growth which is currently affecting development efforts. Since the high rate of population growth can be attributed to the excess of births over deaths, any attempt to limit or slow down the growth rate needs to consider reduction of fertility.

In developing a general framework for the sociological study of fertility, Davis and Blake (1956:211), identified and classified eleven intermediate fertility variables (proximate determinants of fertility) through which economic, social and other factors operate to influence fertility. Bongaarts (1978:105-132) made further improvements by isolating four most important proximate determinants. He discovered that these four factors explained about 97 percent of the variance in fertility in a sample of 30 populations which included developing and developed countries and historical populations. One of the four variables he identified is the postpartum infecundability due to breastfeeding. This factor has been reported to have a strong fertility inhibiting effect in developing countries where Total Fertility Rates (TFRs) are high (Bongaarts, 1980:2).

Following the birth of a child, the woman experiences a period of temporary infecundability, commonly referred to as the postpartum non-susceptible period. During this period, the woman

does not ovulate. Postpartum amenorrhea which is a convenient operational definition for postpartum non-susceptible period is reported to last for about two months on the average when a woman does not breastfeed at all (Chen *et al.*,1974; Perez *et al.*,1971; Bonte and van Balen, 1969). When breastfeeding is intensive and prolonged it has been found to last for a year or more (Singarimbum and Manning, 1976; Chen *et al.*,1974). This is made possible because breastfeeding delays menstruation, inhibits ovulation and therefore reduces the likelihood of conception. It has been shown in developing countries that postpartum infecundability associated with breastfeeding reduces total fecundity by 30 to 33 percent compared to the reduction by contraception of only 5 to 20 percent. In general, the longer a woman breastfeeds, the longer she will remain infecund (Cleland *et al.*,1984).

The nutritional and immunological benefits of breastfeeding are incontrovertible. Breastfeeding is a child care index that has consistently been found to be negatively associated with mortality especially in the first year of life (Mosley and Chen, 1984).

1.2 STATEMENT OF PROBLEM

Although there is paucity of demographic information in Nigeria, various estimates of demographic parameters have indicated consistently high levels of fertility since the 1950's (Orubuloye, 1989:454). For example, the Nigeria Fertility Survey (NFS) of 1981/82 reported a figure of 6.3 as the total fertility rate (TFR) for the country. The Nigeria Demographic and Health Survey (NDHS)

of 1990 estimated Nigeria's TFR to be 6.0.

The infant mortality levels, though still high, declined substantially from 110 per 1,000 live births in 1965-69 to 85 per 1,000 live births in 1975-79. Even as at 1990, the infant mortality rate was estimated to be about 87 per 1,000 live births (Federal Office of Statistics, 1992; National Population Bureau, 1984).

The annual growth rate of the population has been estimated to be about 3 percent. The demographic implication of all these is that if the present trend continues, Nigeria's population is expected to double itself in about 22 years. It is also noteworthy that with the potential parents of the future already so numerous, as suggested by the present age structure, an irresistible momentum for rapid growth is already built into the population. This demographic reality is not desirable for the country as this is bound to impede her development efforts. At the individual level the resulting high dependency burden will lead to further deterioration of the standards of living.

Many studies have shown that despite the many indisputable effects of breastfeeding on fertility, child nutrition and survival, breastfeeding practices have dramatically declined and continue to do so in many developing countries (McCann ***et al.***,1981; Caldwell and Caldwell, 1981; Orubuloye, 1979). While breastfeeding initiation and duration are on the rise again in many developed countries like United States of America, Australia and Scotland, the situation continues to worsen in many developing countries (WHO, 1992). Fewer women now initiate breastfeeding and those who

breastfeed do so for shorter durations and significantly supplement the practice. In Nigeria breastfeeding practice as reported by a number of studies also indicate a decline and high prevalence of early introduction of supplemental feeding. For example, the 1981/82 NFS reported that the average duration of full breastfeeding, that is, breastfeeding without the introduction of any solid or liquid food supplementation is 5.1 months. Four out of every ten women (40.1 percent) started the use of supplementary foods by the time their babies were three months old and about two thirds (63.1 percent) by the time their babies were five months old. The 1990 NDHS also reported that exclusive breastfeeding is rare in Nigeria as only two percent of children under two months of age are fed only on breast milk. Supplements (other than water) are introduced early; as many as 38 percent of children aged 0-1 month were already being given supplements other than plain water. In addition, 57 percent of children aged 2-3 months were reported to be receiving supplements (Federal Office of Statistics, 1992; National Population Bureau, 1984).

Infants that are denied or do not sufficiently derive the benefits of breastfeeding are exposed to higher morbidity and mortality risks. Furthermore, early cessation of breastfeeding for whatever reason would result in early return of menstruation and consequently increased risk of conception. There is a close response relationship between the giving of supplements and morbidity and mortality. The more an infant receives supplements in addition to breast milk, the higher the chances of diarrhoea and

other causes of morbidity, malnutrition and mortality. These facts make the present state of breastfeeding practice of high and very early food supplementation in Nigeria a source of concern.

The recently promulgated National Population Policy has as its main thrust the desire to slow down the high rate of population growth by inducing a change in the reproductive behaviour of women in the country. Going by the document, the TFR is expected to reduce from 6.0 to 4.0. The population growth rate is expected to be 2.5 percent in 1995 and 2.0 percent by the year 2000. Proportion of women having more than four children is expected to reduce by half in 1995 and by 85 percent by the year 2000. The infant mortality and crude death rates are expected to fall to 30 per 1000 and 8 per 1000 respectively by the close of this century (Federal Republic of Nigeria, 1988). Breastfeeding as is now practised in Nigeria can only help increase the TFR, growth rate and the proportion of women having more than four children. In addition, infant mortality rates can only be expected to rise instead of falling under the prevailing circumstances. All these are likely to make the policy targets unattainable.

1.3 RATIONALE OF THE STUDY

Many factors come into play towards the achievement of the National Population Policy goals. Though a rise in the use of contraception will definitely play a significant role, the modest link that exists between breastfeeding and human fertility and its importance to early childhood nutrition, health and survival makes

its practice also very crucial in achieving the goals of the policy. In other words, even with all others factors in place, declines in breastfeeding practice may constitute a major handicap to the achievement of the goals of the policy. To evolve a breastfeeding behaviour that is adequately supportive to the achievement of the goals of the policy, a thorough knowledge of the patterns, correlates and fertility effects of breastfeeding is imperative.

Reports of an apparent decline in breastfeeding initiation and duration in many developing countries including Nigeria have led to the adoption of breastfeeding promotion as one of World Health Organization's and United Nations Children's Fund's top policy priorities (Grant, 1988). This study will provide valuable insights to these organizations and other health policy makers responsible for the design of breastfeeding promotion campaigns and child health interventions. If the wish is to reverse any declines in breastfeeding, we must know where such declines are occurring and why.

Whereas quite few studies on breastfeeding practice have been done in Nigeria, to the best of the author's knowledge, most of them cover small areas. A comprehensive study of breastfeeding practice, covering the entire country need to be done. Moreover, findings emanating from this study would both add to the reservoir of knowledge on breastfeeding and its effect on fertility in Nigeria and hopefully stimulate further research efforts.

1.4 OBJECTIVES OF THE STUDY

The general objective of this study is to describe the pattern and correlates of breastfeeding in Nigeria and also to investigate its impact on fertility. The specific objectives are to:-

i. estimate durations of breastfeeding for the country, the health regions and other sub-groups;

ii. describe the patterns and establish the correlates of breastfeeding behaviour in Nigeria;

iii. analyze the relationship between breastfeeding and postpartum abstinence and amenorrhea;

iv. assess the impact of breastfeeding on fertility levels;

v. make recommendations and assess policy implications.

1.5 LITERATURE REVIEW

The postpartum infecundability due to breastfeeding is one of the four most important intermediate fertility variables identified by Bongaarts (Bongaarts, 1978). A wealth of knowledge has been accumulated over the years on breastfeeding behaviour and its correlates among various populations and their sub-groups. Large variations exist in the propensity to begin and continue breastfeeding and the intensity of breastfeeding both within and between societies (Trussell *et al.*,1992). In most developing countries, significant proportions of women of reproductive ages are lactating at any given time, suggesting that breastfeeding is an important aspect of reproductive behaviour in these countries (Pebley *et al.*,1985).

Studies have generally reported that proportions of children ever breastfed are higher and the durations of breastfeeding are longer in Africa and Asia than in Latin America and the Caribbean (McCann ***et al.***,1981). The prevalence of breastfeeding, especially after three months, is highest in Africa and Asia, and lowest in Europe and Americas (WHO, 1992). Universal patterns of breastfeeding have been documented by many researchers in a number of societies (Federal Office of Statistics, 1992; Iskandar ***et al.***,1990; Tu Ping, 1990; Khan, 1990; National Population Bureau, 1984; Dow, 1977). However, in some societies, initiation of breastfeeding is delayed, thereby denying the infant of the colostrum. One of the major reasons for discarding colostrum is that it is believed to be dirty, contaminated and poisonous to the new baby (Ezumezu, 1993). In other cultures, it is believed that watery milk (including colostrum) can be caused by mother drinking too much water and if given to the baby, the infant will get swollen stomach (Castle ***et al.***,1988; van Esterik, 1988).

A number of factors have been found to be associated with breastfeeding behaviour (Huffman, 1984; Smith and Ferry, 1984; Jain and Bongaarts, 1981; Jain ***et al.***,1970). They include place of residence, education of mother, employment status, income, use of modern health care facilities, use of contraception, husband's education and occupation. Other factors found to be associated with breastfeeding are age of mother, parity, place of childhood residence, place of delivery, sex and survival status of the child.

Many studies have documented urban residence to be an

important correlate of breastfeeding behaviour (Thapa and Williamson, 1990; Adeokun, 1988; Akin *et al.*,1986; Smith and Ferry, 1984; Mott, 1984; Knodel *et al.*,1982; Jain and Bongaarts, 1981; Akin *et al.*,1981). They reported negative association between duration of breastfeeding and urban residence. Thapa and Williamson (1990) discovered in their study of South East Asian countries that urban and rural differences have been widening over time, suggesting that in urban areas initiation and/or duration of breastfeeding are declining. Some other studies have also documented patterns that range from clear decline in some areas to clear increases in others, and there are a number of instances of apparent stability in levels of breastfeeding (Trussell *et al.*,1992; Chua *et al.*,1990; Tu Ping, 1990; Millman, 1985; Knodel *et al.*,1982;).

Some of the reasons advanced for the negative association between urban residence and breastfeeding practice are that bottle feeding is considered to be modern and sophisticated, more convenient (especially for women who work away from home), and the absence of breastfeeding role models for young urban women to follow (Huffman, 1984). In addition, it has also been suggested that observed low levels of breastfeeding in urban areas result partly from declining social support (Deang *et al.*,1988; Gussler and Briesemeister, 1980). Social support refers to some actions or behaviour that have a positive effect on breastfeeding behaviour. They include child care help to the mother, household maintenance activities provided by other household members and even expression

of concurring opinions with respect to breastfeeding and of favourable attitude towards the practice (O'Reilly, 1988; Deang *et al.*,1988).

Education of mother is another factor that has been found to be associated with breastfeeding. Education of mother has been found to have opposite effects in developed and developing countries. In developed countries like United States of America, Sweden and Australia, educated women are more likely to breastfeed and for longer durations than uneducated and less educated women. In contrast, education of mother has been found to be negatively associated with initiation and duration of breastfeeding in developing countries (Trussell *et al.*,1992; Chayovan *et al.*,1990; Smith and Ferry, 1984; Anderson *et al.*,1983; McCann *et al.*,1981). Rehan and Abashiya (1981) and Dow (1977) also reported in separate studies in Nigeria that women who have higher education breastfeed for shorter durations than those with lower or no education. Ojofeitimi (1979) also found that mother's level of education is significantly negatively associated with the time of introducing infant formula, that is, the higher the educational level, the earlier the expected time of introducing artificial formula.

It has been suggested that the negative association observed may be due to a simple confounding of mothers education with other explanatory factors such as urban residence (Trussell *et al.*,1992). However, other scholars have discovered that education of mother is negatively associated with breastfeeding duration even after controlling for the effect of other factors (Guilkey *et al.*,1990;

Mott, 1984; Knodel *et al.*,1982; Bracher and Santow, 1982; Jain and Bongaarts, 1981; Gaisie, 1981). Dow (1977) and Aborampah (1985) obtained similar results in Nigeria. Akin *et al.* (1986) however, discovered in their study of breastfeeding patterns and determinants in the Near East that after controlling for the effect of urbanization education of mothers showed little effect.

Another factor that has received some attention from researchers is socio-economic status (measured by husband's education and occupation). Generally a negative association has been found in developing countries (Guilkey *et al.*,1990; Iskandar *et al.*,1990; Akin *et al.*,1986; McCann *et al.*,1981). It is however noteworthy that women's education, urbanization and socio-economic status are highly associated. It has also been reported that the effect of husband's characteristics is reduced by including wife's education and/or residence (Akin *et al.*,1986; Mott, 1984; Jain and Bongaarts, 1981).

The effect of women's work on breastfeeding has produced less consistent results. Though one expects that women's work especially outside the home should impede her ability to breastfeed, available evidence on this appears to be inconclusive (Smith and Ferry, 1984; McCann *et al.*,1981). While some studies reported the expected negative effect (Tu Ping, 1990; Oppong and Abu, 1987; Mott, 1981; Akin *et al.*,1981), others have not found the expected negative impact (Benefo, 1991; Iskandar *et al.*,1990; Akin *et al.* ,1986). The observed inconsistent results may be due to differences in the measures of women's work status used in the studies.

In the Indonesian study by Iskandar ***et al.***(1990), maternal work status was not strongly nor negatively associated with either breastfeeding initiation or continuation. They suggested that this may be because the work status variable measured only whether or not a woman had worked for money since marriage. This, they observed, did not reflect labour force participation postpartum, which is likely to be linked with breastfeeding behaviour. Similarly, Akin ***et al.*** (1986) found women's work status to be less important than expected in their study of Yemen, Jordan, Tunisia and Egypt. Oppong and Abu (1987) however, observed greatest conflict between work and maternal roles among Ghanaian women who work some distance from their homes. Many studies have also documented that women working at home or farming are more likely to breastfeed or have breastfed longer than others (Akin ***et al.***,1986; Akin ***et al.***,1981; Knodel and Debavalya, 1980).

Di-Domenico and Asuni (1979) found in Ibadan, Nigeria, that women in traditional working environments have a tendency to breastfeed longer than those in modern working environments. They also reported that women in modern working environments gave work commitments as the chief reason for stopping breastfeeding. Uyanga (1980), also found in a study in Calabar, Nigeria that job incompatibility is one of the most influential factors in explaining variations in time spent with the child.

One major limitation with most of these studies is that data available do not really permit the identification of the timing of the women's work. Consequently estimated effects do not reveal the

extent of breastfeeding and work incompatibility.

Parity and age of mother have also consistently featured in the study of breastfeeding behaviour and correlates. Age is often used to control cohort, fecundity and other normative aspects of age. A number of studies have shown that mean duration of breastfeeding increases with age and parity (Iskandar ***et al.***1990; Winikoff ***et al.***,1988; Smith and Ferry, 1984; Chen ***et al.***,1974; Jain ***et al.***,1970). Jain ***et al.*** (1970) however discovered after controlling for the effect of such factors as age, education of mother and place of residence, that the effect of parity is not significant. Similarly, Jain and Bongaarts (1981) also reported that the effects of age and parity were not consistent in their study of eight developing countries.

Researches on the effect of household composition on duration of breastfeeding are less conclusive. While some authors have found prolonged breastfeeding to be positively associated with the presence of older children in the household (Akin ***et al.***,1981), others have reported that there is reduced breastfeeding with the availability of servants and older persons in the household (Deang ***et al.***,1988; Butz and DaVanzo, 1981).

The use of health care facilities has been found by many researchers to have a negative association with initiation and duration of breastfeeding (Chayovan ***et al.***,1990; Potter ***et al.***,1987; Anderson ***et al.***,1984). Winikoff and Castle (1988) also reported that contact with more technology and more western-type maternity services are associated with less breastfeeding and early

introduction of infant formula. It has however been suggested that while factors associated with the use of health care facilities may play some role, the fact that women who use these facilities are more likely, than those who do not, to have characteristics that are negatively associated with breastfeeding (such as being urban residents and better educated), may also be an important reason for the observed association.

Studies in developing countries have generally reported that supplemental foods or liquids are given at very early ages (Chayovan *et al.*,1990; National Population Bureau, 1984; Orubuloye, 1979). Adaba (1979) found in a study in Togo that only 14 percent of all currently lactating mothers were practicing full breastfeeding compared to about 70 percent who were supplementing breastfeeding with artificial milk, palp and solid foods.

The use of modern contraceptives has consistently been found to be negatively associated with breastfeeding initiation and duration (Akin *et al.*,1986; Smith and Ferry, 1984; Page *et al.*,1982; Akin *et al.*,1981; McCann *et al.*,1981; Knodel and Debavalya, 1980; Lesthaeghe and Page, 1980). Oni (1985) also reported negative association between contraceptive use and breastfeeding in Ilorin, Nigeria.

While Gomez De Leone and Potter (1989) demonstrated that timing of initiation of contraception and weaning are closely related, Millman (1985) provided a support for the notion that women substitute contraception for breastfeeding to avoid pregnancy in Taiwan. In trying to explain the reasons for the observed

negative association, she suggested that there might exist some third variable which might influence breastfeeding negatively and contraceptive use positively and that the association might be due to this common cause. After controlling for the effects of all the factors identified, the negative association still stood. She further suggested that the set of explanatory variables most analysts had to work with are limited and that the variable that could play this common cause role may have been omitted. Where the set of potential explanatory variables are seriously limited, such an explanation may be plausible but intestable. She however, concluded that the negative association between breastfeeding and contraceptive use in Taiwan appeared to result most importantly from a substitution of contraception for breastfeeding. Tu Ping (1990) also observed in Shaanxi, China that the overall change in the duration of breastfeeding behaviour may have been a consequence of the intensive family planning programmes launched after the introduction of "one child" policy. The use of contraceptives has helped to lengthen the birth intervals, which in turn increased the likelihood of breastfeeding.

Another area that has received considerable attention is the relationship between breastfeeding and postpartum amenorrhea. Postpartum amenorrhea has been described as an important component of birth intervals and one of the most important natural contraceptive mechanisms (Lee, 1988). Many studies have generally shown that populations with longer durations of breastfeeding have longer durations of postpartum amenorrhea (Nath *et al.*,1993; Sharma

and Rutstein, 1991; Srinivasan ***et al.***,1989; Lee, 1988; Huffman, 1984; Howie and McNeilly, 1982; Fisek ***et al.***,1981).

Saxena (1977) reported in a study carried out in India that the mean duration of lactation is about two-and-a-half times the mean duration of postpartum amenorrhea. Corsini (1979) also estimated the mean duration of postpartum amenorrhea among women who did not breastfeed to be about 1.33 months with each additional month of breastfeeding increasing its length by 0.56 months. Bongaarts and Potter (1983) also reported that the relationship between breastfeeding and amenorrhea could be adequately described by a non-linear monotonic increasing function.

For individuals, the duration of postpartum amenorrhea appear to be largely a function of women's breastfeeding practices. The link has generally been hypothesized to be the frequency and intensity of breastfeeding. In a study carried out in Guatamela and Hungary, it was reported that for the first 12 months, higher frequency of breastfeeding was associated with higher probability of remaining amenorrheic (WHO, 1981). Huffman (1984)'s review of studies in developing countries also reported that duration of postpartum amenorrhea and anovulation depend directly or indirectly on the type of nursing practiced by mothers. Lee (1988) also discovered, using data from Kenya, Thailand, Indonesia and Columbia, that frequency and pattern of breastfeeding are important determinants of a woman's risk of resuming menstruation.

Using hazard model approach, Rodriguez and Diaz (1993) studied breastfeeding and length of postpartum amenorrhea. Looking at the

frequency of suckling during the day and during the night, they learnt that at least seven episodes per day and three episodes per night reduced the risk of menstruation 50 percent regardless of duration. After combining supplementation and frequency of suckling they discovered that breastfeeding patterns explained most of the effect of duration. They discovered that partial breastfeeding increased the risk considerably (even after adjusting for frequency of suckling), and high frequency of suckling reduced the risk for both full and partial breastfeeding. They concluded that supplementation is most likely linked to intensity of suckling and has an effect over and above the frequency of suckling.

Knodel *et al.* (1982), however discovered in Thailand that despite the substantial duration of overall breastfeeding, especially among rural women, the median duration of postpartum amenorrhea was short. They suggested that this might be due to fairly short durations of full breastfeeding, which typically has stronger inhibiting effect on the overall return of ovulation than mixed feeding. The study of Prema and Ravindranath (1982) in Hyderadad, India to investigate the effect of the duration of unsupplemented lactation on lactational amenorrhea and inter-pregnancy interval, reported a good correlation between duration of lactation and lactational amenorrhea, high correlation between the period during which the infant was solely breastfed and lactational amenorrhea. They also found mean duration shorter in women who introduced supplements earlier. Their data suggested that the early introduction of supplements was associated with shorter duration of

lactation, lactational amenorrhea, and inter-pregnancy interval. Undue delay in the introduction of supplements beyond 12 months however did not result in indefinite postponement of the return of menstruation.

Studies in many developing countries have shown that child-spacing depends primarily on postpartum abstinence and amenorrhea both of which are related to breastfeeding. In some cultures, breastfeeding is reinforced by the practice of postpartum sexual abstinence. Although linked to breastfeeding, postpartum abstinence cannot be completely identified with lactation taboo because it is shorter than the duration of breastfeeding in some societies, and longer than it in others (van de Walle, 1987, Caldwell and Caldwell, 1987). Studies have reported that some women abstain from sexual relations while still breastfeeding because of the belief that men's semen is capable of contaminating the breastmilk and through it affect the baby (van de Walle and van de Walle, 1991; Vanlandingham ***et al.***,1991; Trussell ***et al.***,1989; van de Walle, 1987; Caldwell and Caldwell 1981; Orubuloye, 1987). When premature pregnancy occurs, breastfeeding is automatically terminated because of the belief that pregnancy may affect the health of the baby. Most mothers therefore abstain from sexual relations after child birth because of the concern about the health of the child and mothers themselves (Orubuloye, 1987; Orubuloye, 1979; Caldwell and Caldwell, 1979). In some cultures, couples abstain from sexual relations for as long as the woman is amenorrheic or the entire breastfeeding period (Mhloyi, 1987). In other cultures, postpartum

abstinence is observed until a child has attained a certain physical growth and social development such as the ability to speak, walk or even run errands (Mhloyi, 1987; Okore, 1987). In the face of very low prevalence of contraceptive use, the duration of postpartum sexual abstinence is an important component of postpartum nonsusceptible period and therefore positively influences the birth interval. However, studies have shown that many of these traditionally prescribed norms and limits are being violated as a result of influence of modernization.

One of the most significant impacts of breastfeeding practice is its now well established fertility-inhibiting effect. This has been well documented both at aggregate and individual level analysis (Santow, 1987; Habicht and Meyers, 1985; Bongaarts and Potter, 1983). In Asia and Africa breastfeeding has been shown to avert an average of four potential births (representing about 25 percent of the total fecundity) per woman. Kalu (1994) also reported in his study on Nigeria that postpartum infecundability due to breastfeeding averted about 4 potential births, amounting to 39 percent of reduction in total fecundity by all the proximate determinants. As use of modern contraceptives increases in a society, it tends to substitute for the contraceptive effect of breastfeeding (Thapa ***et al.***,1988).

It has been suggested that to measure the impact of breastfeeding on fertility, especially in a non-contracepting population, is to compare birth intervals of women who breastfed with those who did not. A number of studies conducted in Asia have

shown that birth intervals were much longer for breastfeeding mothers than for non-breastfeeding mothers (Jain, 1969). It has also been reported in Punjab and Alaska that the conception rates of women who were not using contraceptives and who continued breastfeeding remained low for nearly a year after birth compared to those who were not breastfeeding (van Ginneken, 1974). Evidence from Senegal has also revealed that birth interval tends to increase systematically with longer durations of breastfeeding (Cantrelle and Leridon, 1971). Jain and Bongaarts (1981) and Smith (1985) also discovered that each additional month of breastfeeding increases the average birth interval by 0.25 to 0.50 months.

Rutstein (1991) used data from 25 Demographic and Health Surveys to determine the impact of breastfeeding on fertility. He discovered that postpartum amenorrhea, maintained by breastfeeding, had the most impact on fertility. The frequency of breastfeeding and postpartum amenorrhea were also found to be significantly associated.

The contraceptive potential of breastfeeding is an area that has generated some controversy in recent years (Bracher, 1992; Trussell and Santow, 1991; Kennedy ***et al***.,1991). The 1988 Bellagio Consensus, which recommended breastfeeding as a safe and effective means of regulating fertility, indicated that when a woman fully or nearly fully breastfeeds and remains at the same time amenorrheic, she has better than 98 percent protection against pregnancy in the first six months postpartum. Though the validity of the consensus has been tested prospectively in many settings, there has been

suggestions from studies done in Australia, Chile, Scotland and Bangladesh, that there may be differences in the duration of protection against pregnancy afforded by breastfeeding in different cultural settings. For example, Weis (1993) found that Bellagio cut-off point for use of contraceptives (6 months) can be extended by six months for breastfeeding women in Bangladesh. He reported that at 30 months postpartum, the number of pregnancies among amenorrheic women remained very low. He concluded that the use of modern contraception in Bangladesh before 12 months postpartum would result in providing double protection, and thus would be redundant. Data from a Samoa menstruation study have however suggested that lactation, even intensive on-demand lactation, did not inhibit menstruation and conception. Exploring the applied and theoretical implications of continuing to accept lactation as a universally effective fertility control mechanism, Fitzgerald (1992) suggested that such thinking can have disastrous implications for family planning programmes as it keeps one from challenging long-held assumptions about lactation's role in population growth of early populations. Guided by the above review of existing literature, the following framework is proposed for the study.

1.6 CONCEPTUAL FRAMEWORK

The conceptual framework for this study draws from the works of Bongaarts (1978), Bongaarts and Porter (1983), Sharma and Rutstein (1991) and Rutstein (1991). Figure 1.1 gives the schematic

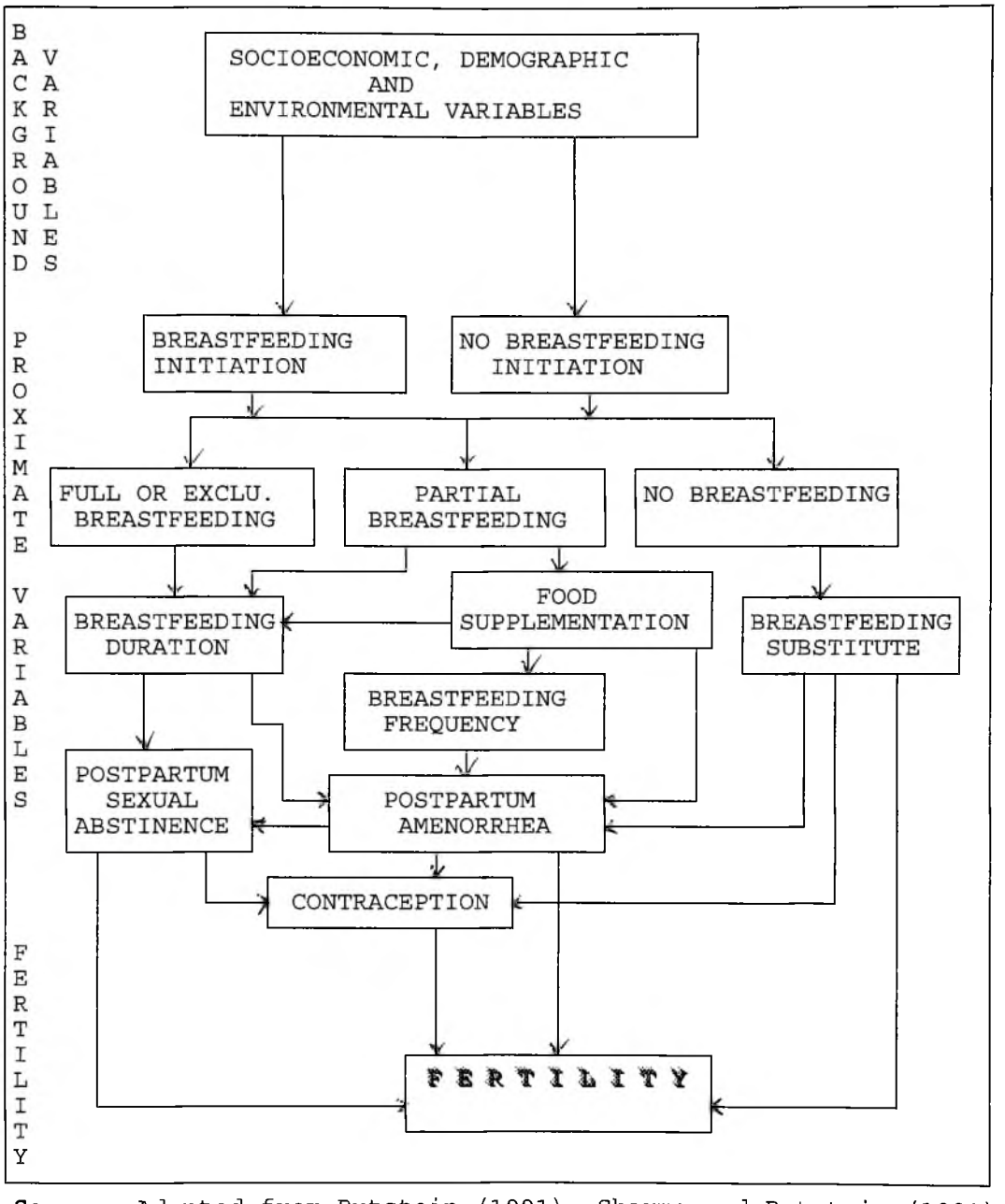
representation of the framework.

The figure puts breastfeeding behaviour (initiation, patterns, frequency, intensity and supplemental feeding) as a factor being influenced by the background variables. Breastfeeding behaviour in turn influences fertility through postpartum amenorrhea and abstinence.

The framework is based essentially on the microeconomic theory of consumer choice behaviour, whereby breastfeeding is perceived as a choice among a number of alternatives to achieve the same goal(s) (Sharma and Rutstein, 1991). Breastfeeding is expected to entail certain costs. Some benefits are also derivable from the practice. The costs include time involved and the nutrient required in the practice. On the other hand, the benefits are expected to come in form of child health, survival, development and the contraceptive effect of breastfeeding. In making their choices, mothers are expected to respond to changes in the cost and benefit of breastfeeding.

In effect, women's decision to initiate as well as to continue breastfeeding and for how long is the outcome of weighing the perceived costs, availability and effectiveness of alternative means of contraception and infant feeding (Sharma and Rutstein, 1991). The decision-making is influenced by the background variables. Owing to data constraints, the role of breast milk substitutes, and their prices, in influencing breastfeeding decisions, will not be considered.

Figure 1.1 Framework for Analysis of Patterns, Correlates and Fertility Effects of Breastfeeding.



Source: Adapted from Rutstein (1991), Sharma and Rutstein (1991) and Bongaarts and Potter (1983).

The fertility-inhibiting effect of breastfeeding works through proximate determinants: postpartum infecundity, represented by postpartum amenorrhea, postpartum abstinence and contraception. The breastfeeding behaviour (initiation, duration, frequency, intensity and use of supplements) affects the proximate determinants of fertility. The frequency, intensity and duration of breastfeeding affect abstinence or reduce coital frequency and use of contraception. The frequency and duration of breastfeeding are also affected by supplemental feeding (Rutstein, 1991).

1.7 HYPOTHESES OF THE STUDY

The hypotheses for the study include the following:-

i. women in the rural areas breastfeed for longer durations than their urban counterparts;

ii. women with higher education breastfeed for shorter durations than those with lower education;

iii. women who were assisted at delivery by traditional birth attendants are more likely to continue breastfeeding than those who were assisted at delivery by medical personnel;

iv. duration of lactation is positively associated with duration of postpartum amenorrhea;

v. male children are breastfed longer than female children;

vi. frequency of breastfeeding exerts significant effect on the probability of remaining amenorrheic.

1.8 PLAN OF STUDY

This thesis is divided into seven chapters. Chapter one gives the introduction to the study. This includes the background to the study, statement of research problem, rationale and objectives of the study, review of relevant literature, conceptual framework, hypotheses and plan of study. The second chapter presents the sources and evaluation of data for the study. It also describes the methodology to be used in the study. This includes research design, selection of variables, definition of concepts used and techniques of analysis.

Chapter three focuses on characteristics of survey respondents while chapter four presents the patterns, prevalence and duration of breastfeeding. The fifth chapter examines the influence of socioeconomic and demographic factors on breastfeeding behaviour: continuation, duration, frequency and supplementation. Chapter six treats the impact of breastfeeding on fertility, while chapter seven, which is the last chapter gives the summary, conclusions and policy implications of the study.

CHAPTER II

DATA SOURCES, METHODS OF ANALYSIS AND EVALUATION OF DATA

2.1 DATA SOURCES

This study is based on the data collected by the Demographic and Health Survey programmes in Nigeria. The Nigeria Demographic and Health Survey (NDHS) project was jointly funded by United States Agency for International Development (USAID) and the Federal Government of Nigeria. It was executed by the Federal Office of Statistics (FOS), with technical support from IRD/Macro International Inc. Columbia, Maryland.

The NDHS is a nationally representative survey covering all the states of the Federal Republic of Nigeria. As at 1990 when the survey was being conducted, Nigeria was made up of 21 states and the Federal capital territory (Abuja). The survey was designed to provide reliable information on fertility, family planning, infant and child mortality, maternal care, vaccination status, breastfeeding and nutrition. The field work which was done in two phases took place between April and October 1990. All women aged 15 to 49 years, irrespective of their marital status, constituted the NDHS universe.

From the 1973 census enumeration areas (EA's), a selection of over 4,000 EA's was made over the entire country, with probability proportional to size. A sample of about 10,000 households in 299 EA's (132 Urban and 167 rural) was designed. A fixed number of 34 households per EA was taken in order to have better control of the sample size. Thus, the NDHS sample is a weighted sample maintaining

the two-fold over-sampling in the urban areas. In order to ensure unbiased estimates resulting from unequal selection probabilities, it is necessary to 'weight down' the over-sampled areas and 'weight up' the under-sampled areas. Unless stated otherwise, information given in all tables in subsequent sections of this thesis are weighted. A total of 8,781 women were completely interviewed in the whole country. Further details of the survey methodology and sample as well as some findings have been published in the country reports (FOS, 1992).

2.1.1 Nigeria Demographic and Health Survey Instrument

The NDHS instrument is made up of three questionnaires: household, individual and service availability. The household questionnaire was provided for the collection of information for each household member regarding name, age, sex, residence, relationship to head of household, education, fostering and the eligibility for the individual survey.

The individual questionnaire was only administered to eligible respondents. The eligible respondents were all women aged between 15 and 49 years. The individual questionnaire elicited from eligible respondents the following information:- respondent's background, reproduction, contraception, pregnancy and breastfeeding, immunization and health, marriage, fertility preference, husband's background and woman's work, weight and length of the last three living children born five years preceding the survey.

The service availability questionnaire collected information on community characteristics, availability of public services nearest to or in the community, health and family planning programmes in the community and facility identification.

This study is however based on raw data collected using the individual questionnaire and made available by DHS, IRD/Macro Inc.

2.2 DEFINITION OF CONCEPTS

The following are the definitions of some of the concepts used in this study.

(a) Exclusive breastfeeding is when a child receives nothing but breast milk.

(b) Full breastfeeding refers to the situation where the child may receive plain water in addition to breast milk. Therefore, exclusive breastfeeding is a subset of full breastfeeding.

(c) Partial or supplemented breastfeeding is the situation in which the child does not receive all his/her nutritional requirements through breast milk, that is, foods and formulas are used in addition or as a replacement for some breastfeeds.

(d) Any breastfeeding refers to situations where children breastfeed at all, even if only once a day.

(e) Fecundity refers to the physiological capacity of a woman to produce a live child.

(f) Fecundability is the probability of conceiving per month (among cohabiting women, who are not pregnant, sterile or temporarily infecundable).

(g) Fertility - refers to actual reproductive performance.

(h) Household - consists of a person or group of persons who live together in the same structure or dwelling, share common catering arrangements and recognize one member as the head.

(i) Age - is a fundamental characteristic of the population and it is usually truncated to the number of completed years, that is age at last birthday. In this study age in completed months is also used in some cases, most especially for children.

(j) Education - it refers to only formal education and is defined as the highest level attained.

(k) Occupation - is the major activity of a person.

(l) Sexual Abstinence - is a conscious effort by individuals who are in some kind of union to avoid having sex.

(m) Postpartum Amenorrhea - is the temporary absence of menstruation after confinement.

(n) Anovulation - refers to menstruation without ovulation.

(o) Parity - is the number of children previously born alive to a woman; for example, "two-parity women" are women who have had two children up till now, and "zero-parity women" have had no children up till now.

(p) Health region - is made up of a number of states, grouped together purely for operational purposes by the Federal Ministry of Health. The groupings are shown in appendix 3.1. In this study region or health region refers to the same thing.

(r) Open Interval -refers to the interval between the last birth

and the date of interview.

(s) Last Closed Birth Interval -refers to the period between the last-but-one live birth and the last live birth preceding the interview.

2.3 METHODS OF ANALYSIS

Based on information gathered from the review of past studies done on breastfeeding, a number of factors found to associate with breastfeeding initiation and duration are chosen. The choice is based on theoretical considerations and the nature of data available for use in the study. The dependent variables considered in this study include: duration of breastfeeding, amenorrhea and abstinence, frequency of breastfeeding, use of feeding bottles incidence and age at given formula or milk and solid/mushy foods. Other dependent variables are the dichotomous variables of incidence of breastfeeding (full and any), abstinence, contraceptive use and amenorrhea.

The independent (explanatory or predictor) variables used are:- Education of mother, age, parity, work status, place of work, occupation, contraception, more children wanted, literacy, access to media, religion, marital status, type of union, region of residence, place of residence, place of childhood residence, sex and survival status of child, husband's education and occupation, ownership of assets (TV, refrigerator, radio), source of antenatal care, place of delivery, assistance at delivery and frequency of feeds.

Computations and cross-tabulation of means, medians,

proportions and other summary statistics by various inter-related variables will be utilized in the course of the analysis. Computations and comparisons of these statistics, analysis of variance, linear regression, multiple classification and logistic regression analysis techniques will be used to ascertain the patterns of association between the dependent variable and the explanatory variables.

Using only the information provided in the last-closed-birth interval to estimate breastfeeding patterns has a major disadvantage. It introduces selection biases which could reach serious proportions. This is because the duration of breastfeeding for children still being breastfed are censored observations, since we do not know exactly how long the child will be breastfed. All that is known is that their duration of breastfeeding will be at least as long as the time they have breastfed the child. Children already weaned are uncensored, since we know their duration of breastfeeding. Appropriate estimation procedures for censored data are many and varied with different underlying assumptions and data requirements. They are also known to vary considerably in their capacity to yield details of frequency distribution. Breastfeeding data derived from all births in a given period immediately preceding the survey is therefore used in the estimation of mean duration of breastfeeding. The data have the advantage of not being affected by digit preference as is in the case of retrospectively reported durations. Estimates of breastfeeding durations are made using prevalence-incidence method.

The prevalence-incidence estimates of mean duration of breastfeeding are obtained by dividing the number of currently breastfeeding mothers by the average number of births per month.

$Y = B/N$, where Y represents the mean duration of breastfeeding, B represents the total number of children currently being breastfed (irrespective of the age) and N is the average number of births per month. This method, developed by Mosley and his colleagues, has been acknowledged to be very short, simple and robust (Page *et al.*,1982). It assumes that the number of births per month has been constant throughout the fixed period (in our case three years) before the survey. The method is relatively insensitive to errors in the reported dates of birth for the children in question but its major limitation is that it can only be used to estimate mean duration of breastfeeding.

As earlier mentioned, to study the pattern of association and to disentangle the net effect of each predictor variable on breastfeeding, multiple linear and logistic regression and multiple classification analysis will be used. The strength of these techniques lie primarily in their use as means of establishing the relative importance of independent variables to the dependent variables.

In a situation where the dependent variable of interest is a dichotomy like in the case of incidence of any and full breastfeeding, the usual assumptions underlying the linear model are rarely satisfied. Another more serious problem may also arise when predictions lie outside (0,1) interval (Halli and Rao,

1992:101). A statistical technique that circumvents these problems is the logistic regression model. Specifically, a logistic model is of the form:

$$log\ p/(1-p) = B_0 + B_1 X_1 + ...+ B_tX_t,$$

where p denotes the probability of an infant fully, partially or exclusively breastfeeding or a mother is amenorrheic; X denotes a set of independent variables; and B denotes their corresponding unknown regression coefficients. In other words, p which is the probability of an event can be written as:

$$p = e^Z /1 + e^Z$$

where Z is the linear combination

$$Z = B_0 + B_1X_1 + B_2X_2 +.....+ B_tX_t$$

This model operates on individual or micro-level data and employs both global test of the model as well as individual test for significance of the co-efficient estimates. The global test is the likelihood ratio chi-squared statistic which is asymptotically distributed as a chi-square under the null hypothesis. For the individual predictors, the test statistic is the ratio of coefficient estimates to their standard errors. This test statistic is approximately standard normal under the null hypothesis (Halli and Rao, 1992:104). One advantage of this model is that the analysis and interpretation are quite similar to the well-known procedures of multiple regression. A statistic that is used to look at the partial correlation between the dependent variables and each of the independent variables is the R statistic, whose value ranges from 1 to 1. A positive value depicts that as the variable

increases in value, so does the likelihood of the event occurring. A negative R indicates the opposite. A small value of R indicates small partial contribution to the model by the variable (Norusis, 1992:5).

Multiple Classification Analysis (MCA) is used to explore the differentials and effects of the predictors. The technique is a more sophisticated form of standardization as it is applicable to two or more independent variables. The general equation for the MCA is $Y_{ij} = u + a_i + b_j + \ldots\ldots\ldots + e_{ijk}$,

where u is the overall mean

a_i is the effect of the ith category of predictor A

b_j is the effect of the jth category of predictor B

e_{ijk} is the residual effect.

The model is additive and assumes that there is no higher order interaction effects. This makes it possible for us to assess the effect of each of the predictors while holding the effect of others constant. The eta coefficient is a correlation ratio, which shows how well a given predictor can explain the variation in the dependent variable. The square of eta value, associated with the set of unadjusted effects for each factor gives the proportion of variation explained by all the combined categories of a factor. The beta values are equivalent to standardized partial correlation coefficients in multiple regression analysis. They measure on the basis of the adjusted means, the ability of a given predictor to account for variations in the dependent variable. The square of beta shows what proportion of the variation is explained by the

predictor, after taking into account the proportion explained by other predictors. Multiple classification analysis deals with both linear and non-linear relationships among predictors and the dependent variable (Tawiah, 1994:241; Ogawa, 1980:114-115).

Bongaarts model of the analysis of proximate determinants of fertility is used to estimate the fertility inhibiting effect of breastfeeding. According to the model, the total fertility rate (TFR) can be expressed as follows:

TFR= C_m x C_c x C_a x C_i x TF where C_m is the index of marriage, C_c, the index of contraception, C_a, the index of abortion, C_i, the index of infecundability and TF, the potential fertility or total fecundity, ie the total number of children a woman would bear if there were no inhibiting effects. The component of abortion C_a, as in most studies is not considered because of non-availability of data to compute it. Consequently, the model is reduced to three components. Further details on the estimation of indexes and fertility reducing impact of proximate determinants are included in appendix 2.1.

2.4 EVALUATION OF DATA

The quality of estimates derivable from a survey data, like the NDHS data, depends to a large extent on the accuracy of the information supplied by the respondents and recorded by the interviewers. Experiences have shown that information collected in a survey of the Demographic and Health Survey type may be subject to a number of errors and biases. Errors may be introduced into the

data at planning, implementation or processing stages. Much of the information collected in Demographic and Health Surveys are retrospective. Such information is particularly prone to misreporting errors. Dates of events may be wrongly stated or events completely omitted. These may be as a result of recall lapse on the part of respondents. There may also be tendency to report ages and durations on preferred digits thereby resulting in heaping problems. In particular, there may be the tendency to report durations of breastfeeding, amenorrhea and abstinence in multiples of six months and ages of respondents on digits ending in 0 and 5.

In the NDHS, information on various aspects of breastfeeding practice was collected for all children born five years before the survey. These include duration, frequency, food supplementation and use of feeding bottles. The basis for selecting these births is the birth history, whereby information such as birth dates, age, and survival status are collected. All age specific analysis of breastfeeding data uses the information from the birth history. Consequently, the quality of the birth history data, affects the quality of breastfeeding data. The usefulness of the survey data in providing reliable estimates is dependent on how far they are affected by these errors and biases and how far these errors have been detected. This is very essential if one is to avoid wrong interpretation of the substantive findings that will eventually emerge from this study. The focus here is to evaluate the NDHS data, with particular reference to age, birth date and duration reporting. Apart from helping to assess the quality of data, this

exercise will bring to light the pitfalls in survey methodology and the imperfections inherent in the actual data collected.

2.4.1 Completeness of birth date reporting

In the NDHS, eligible respondents were asked to report both the month and year of their birth and their current age. The accuracy of information on birth date is assessed by examining the degree of completeness with which they were reported. Table 2.1 presents the percentage of respondents who were able to report their birth year and month by selected background characteristics.

Table 2.1 Percentage of women able to report their birth year and month according to current age and selected background characteristics.

SELECTED CHARACTERISTICS	CURRENT AGE OF WOMEN:			ALL WOMEN	NO OF WOMEN*
	<25	25-34	35+		
NIGERIA	65.3	54.5	42.7	55.3	8,781
REGION:					
Southeast	79.6	65.4	47.0	65.6	2,768
Southwest	86.8	70.7	53.1	72.0	1,915
Northwest	37.8	39.0	26.0	35.2	2,098
Northeast	49.9	44.6	42.7	46.1	1,999
RESIDENCE:					
Urban	82.4	68.8	60.7	72.6	2,187
Rural	58.6	49.8	37.9	49.5	6,594
EDUCATION:					
No education	42.1	42.8	36.4	40.4	5,020
Primary	68.0	61.8	59.2	64.1	2,099
Secondary+	90.2	89.7	83.5	89.5	1,662
ACCESS TO MEDIA:					
No Access	48.5	41.0	36.4	42.1	3,942
Have Access	76.9	65.0	49.5	66.1	4,838
LITERACY:					
Easily	87.9	83.6	75.0	85.0	2,249
With difficulty	69.7	66.9	54.3	65.8	994
Not at all	44.6	43.0	36.9	41.3	5,530

NOTE: * -totals for some characteristics are less than the total sample because of missing values.
Source: NDHS, 1990 Raw data file.

About 55 percent of all respondents were able to report their birth year and month. Birth date reporting by current age of respondents shows that younger women are more able to report their birth date completely than older women. It is possible that younger women reported their birth dates better because they are more likely than the older ones to have had some education. The percentage of women completely reporting their month and year of birth is higher for Southern women than their Northern counterparts. Women residing in urban areas reported their birth dates better than rural women. Similarly, the proportion of respondents who completely reported their month and year of birth increases with increase in the level of education and literacy. Exposure to mass media is also found to be positively associated with the completeness of birth date reporting.

Each eligible respondent who had ever given birth to one or more children was asked to report a complete history of all live births she had experienced. Information collected include year and month of birth for each child. Table 2.2 presents the percentage of children whose birth year and month of birth were completely reported according to age of mother and selected background characteristics. The proportion of children ever born whose year and month of birth were completely reported in the total sample is 81.9 percent.

The birth date information are less complete for births to older women. This may be because older women may have difficulty remembering details about births that they had many years ago.

Table 2.2 Percentage of children whose birth year and month were completely reported according to the current age of mother and selected background characteristics.

SELECTED CHARACTERISTICS	CURRENT AGE OF MOTHER: <25	25-34	35+	ALL CHILDREN	NO OF CHILDREN*
NIGERIA	85.3	83.2	80.2	81.9	29,074
REGION:					
Southeast	97.0	96.6	90.4	93.2	9,258
Southwest	96.8	87.6	84.0	86.0	5,919
Northwest	67.8	68.0	57.4	63.3	7,220
Northeast	88.2	80.7	82.9	82.7	6,678
RESIDENCE:					
Urban	94.2	89.0	88.3	89.2	6,013
Rural	83.1	81.6	78.2	80.0	23,061
EDUCATION:					
No Education	76.1	78.3	77.0	77.4	20,632
Primary	94.4	90.9	90.2	91.3	6,355
Secondary +	98.2	99.1	95.0	97.6	2,087
SEX OF CHILD:					
Boy	84.0	83.2	79.6	81.5	14,977
Girl	86.6	83.2	80.8	82.3	14,097
SURVIVAL STATUS:					
Alive	88.8	86.1	82.7	84.7	23,041
Dead	68.3	70.5	72.0	71.2	6,033
LITERACY:					
Easily	98.0	97.9	95.1	96.8	3,956
With Difficulty	96.3	94.0	90.5	92.8	2,833
Not at all	79.0	78.6	77.1	77.9	22,270
MEDIA ACCESS:					
No Access	79.0	78.4	75.4	76.8	14,242
Have Access	91.2	87.3	85.4	86.8	14,828
HUSBAND'S EDUCATION:					
No Education	75.9	76.0	75.2	75.5	17,055
Primary	93.6	91.3	89.0	90.4	7,611
Secondary +	97.8	93.8	88.3	92.1	4,036

NOTE: * -totals for some characteristics are less than the total sample because of missing values.
Source: NDHS, 1990 Raw data file.

In addition, older women are more likely to have older children whose birth dates they might have been forgotten and could not easily recall at the time of interview. On the other hand, younger mothers are possibly more educated than older mothers and may not

have difficulty recalling birth dates. In the regions, the percentage of children whose birth year and month were completely reported ranges between 63.3 percent in the Northwest to 93.2 percent in the Southeast. Just like in the case of birth date reporting for mothers, Southern mothers completely reported the birth year and month of their children compared to their Northern counterparts. Urban women more completely reported the birth dates of their children compared to their rural counterparts.

Completeness of birth date reporting is positively associated with level of educational attainment and literacy. There appear to be no sex differential in completeness of birth date reporting. Exposure to mass media by respondents is also found to be positively associated with completeness of birth date reporting. Living children's birth dates are however more completely reported than those of dead children. This may have arisen because women may be unwilling to enter any discussions on their dead children as it may bring back sad memories.

It is expected that correctly ascertained and recorded birth date information at the data collection stage would have ensured that the breastfeeding information is collected for all children born after the cut-off date (January 1st, 1985). The quality of birth date reporting for births in the last five years preceding the survey is presented in table 2.3.

The incompleteness of birth date information for the country and selected background characteristics tend to increase as one gets further away from the year of interview (1990). The problem

appears to be more severe with births to respondents in the Northern regions, rural areas and with no formal education.

Table 2.3 Percentage of children born five years preceding the survey with incomplete birth date information by year of birth and selected characteristics of their mothers.

SELECTED CHARACTE-RISTICS	YEAR OF BIRTH: 1985	1986	1987	1988	1989	1990	ALL	NO OF CH/REN*
NIGERIA	14.3	16.5	11.6	13.0	5.7	2.2	10.9	9,157
REGION:								
Southeast	5.6	3.9	1.5	3.3	1.8	0.3	2.9	2,716
Southwest	7.6	8.4	8.0	8.7	0.8	0.0	5.9	1,683
Northwest	33.9	36.2	21.7	27.6	9.1	3.6	21.9	2,568
Northeast	10.4	16.4	16.4	12.4	10.5	3.2	11.8	2,187
RESIDENCE:								
Urban	6.9	7.0	9.0	4.0	2.9	2.1	4.5	1,911
Rural	16.3	19.2	12.3	15.3	6.5	2.2	12.3	7,241
MOTHER'S AGE:								
15-24	17.3	25.2	15.4	12.5	9.1	1.8	12.7	2,346
25-34	14.5	13.0	10.2	13.5	3.2	1.3	9.8	4,728
35-49	12.3	17.4	11.2	12.4	5.8	5.3	11.4	2,080
EDUCATION:								
No Educ	19.8	22.1	16.0	17.5	8.4	3.2	15.0	5,826
Primary	5.6	7.8	4.1	7.0	2.3	0.4	14.7	2,267
Secondary+	2.0	3.6	3.0	0.4	0.3	0.0	1.5	1,059

NOTE: Educ -education; CH/REN -children
* -totals for some characteristics are less than the total sample because of missing values.
Source: NDHS, 1990 Raw data file.

2.4.2 Quality of Age Reporting

Age is a basic variable in demographic analysis. In most developing countries, where majority of people do not know their exact ages, collection of fairly accurate age data is very problematic. This gives room for approximation of respondents' ages which often results in heaping of responses on preferred digits (e.g digits ending in 0 and 5) with consequent deficit in other

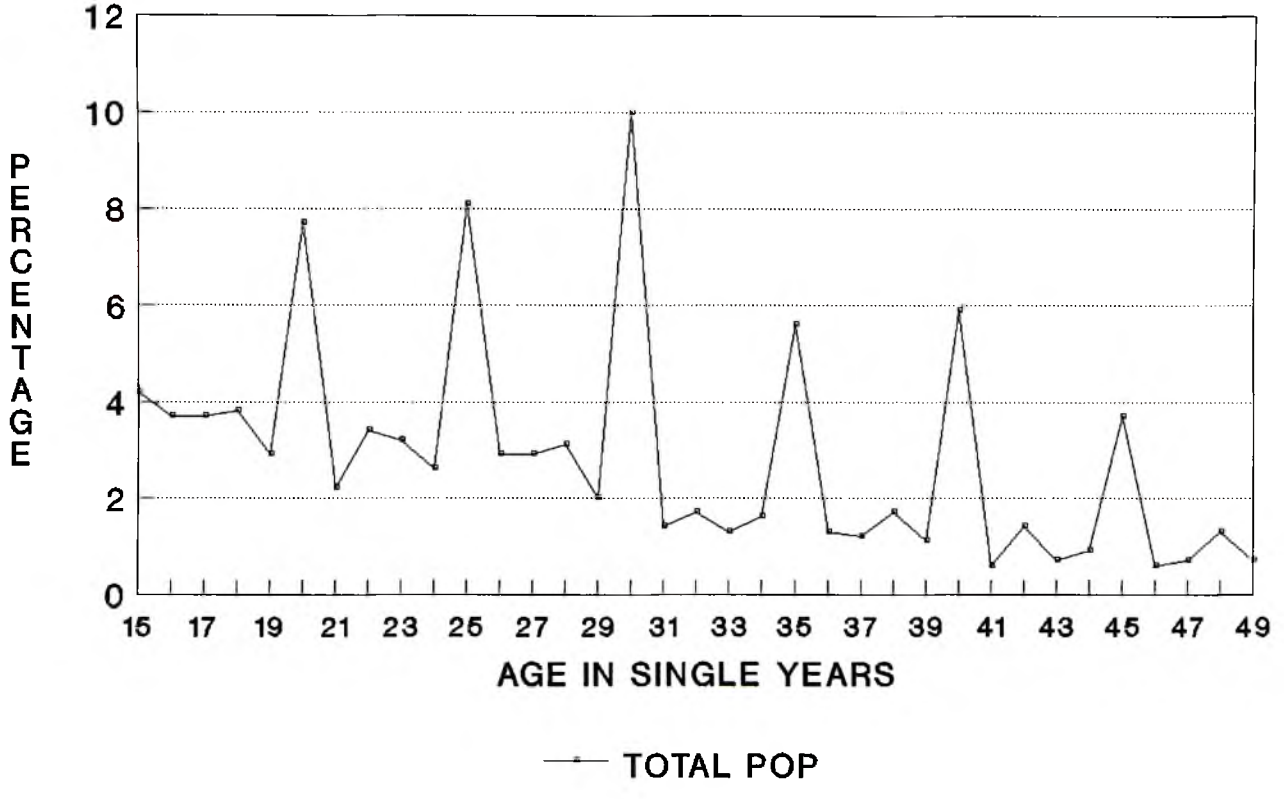
digits. This phenomenon can lead to severe distortions in the data collected and in age or period specific rates based on the data.

The magnitude and nature of errors in age data are known to vary substantially among different populations and their subgroups. It is also generally agreed that the quality of age reporting is a function of cultural importance of age in a society and the overall level of education prevailing in a particular society. Also of significance is the type of question used to collect age data and care taken by the interviewers in asking and recording the responses.

The reported single year age distribution of eligible respondents in the individual questionnaire is also considered with the aim of examining the extent of digit preference problems inherent in the data. Figures 2.1 to 2.4 give the graphical representations of reported single year age distribution for all women aged 15 to 49 years for the total sample, current place of residence, region of residence and for the educational categories. The figures reveal a saw-edge pattern with serious heaping at digits ending in 0 and 5. This is essentially a manifestation of age misreporting which may have been brought about by the tendency, both among respondents and interviewers, to prefer or avoid certain digits. Heaping is particularly more acute at age 30. The implication is that the greater the amount of heaping, the lower the confidence in the quality of the age data.

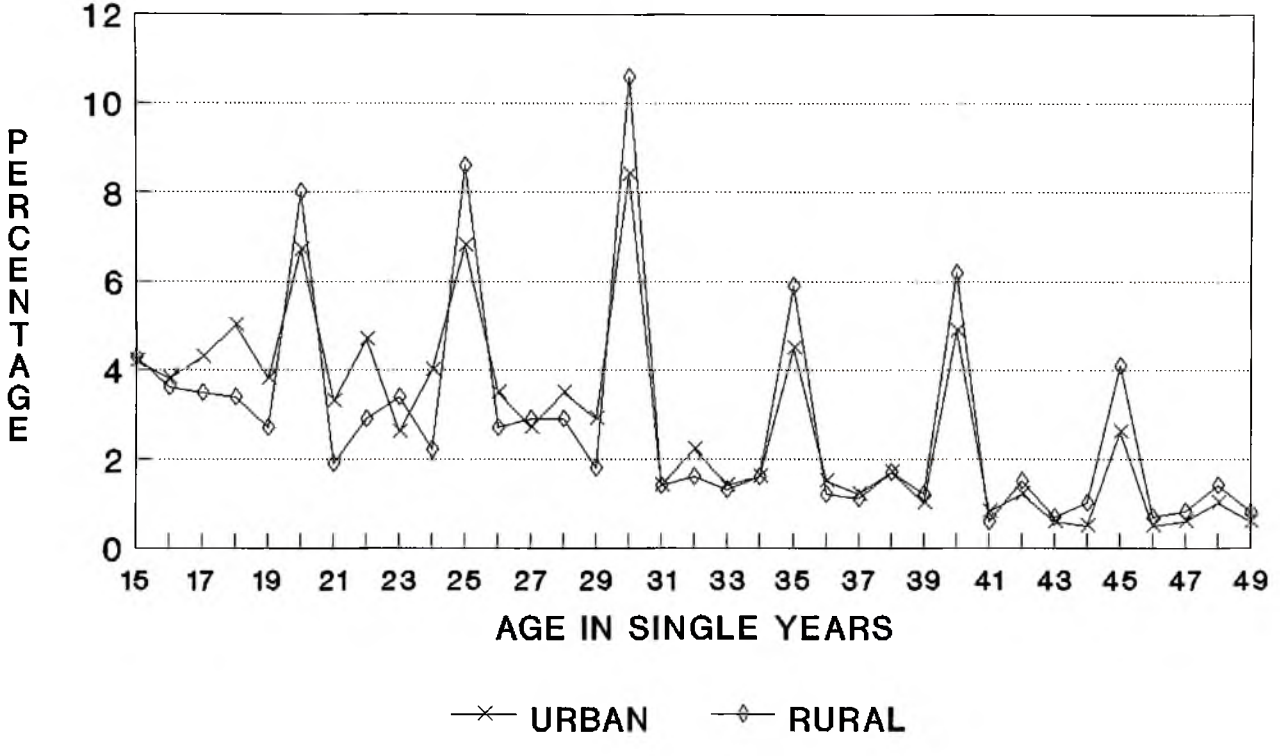
The extent of age misreporting is observed to vary considerably by the socio-economic characteristics of respondents.

Figure 2.1 Percentage distribution of women aged 15-49 years.



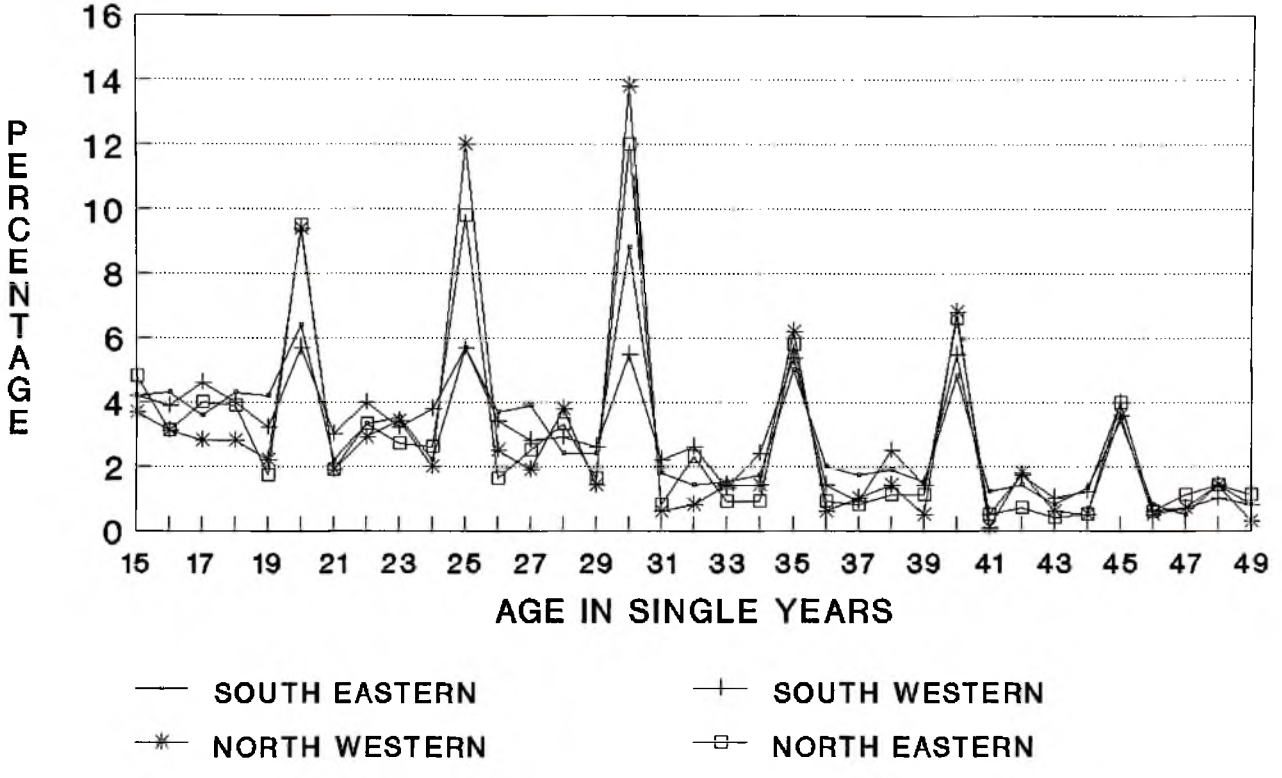
SOURCE: NDHS, 1990 Raw data file

Figure 2.2 Percentage distribution of women aged 15-49 years according to place of residence.



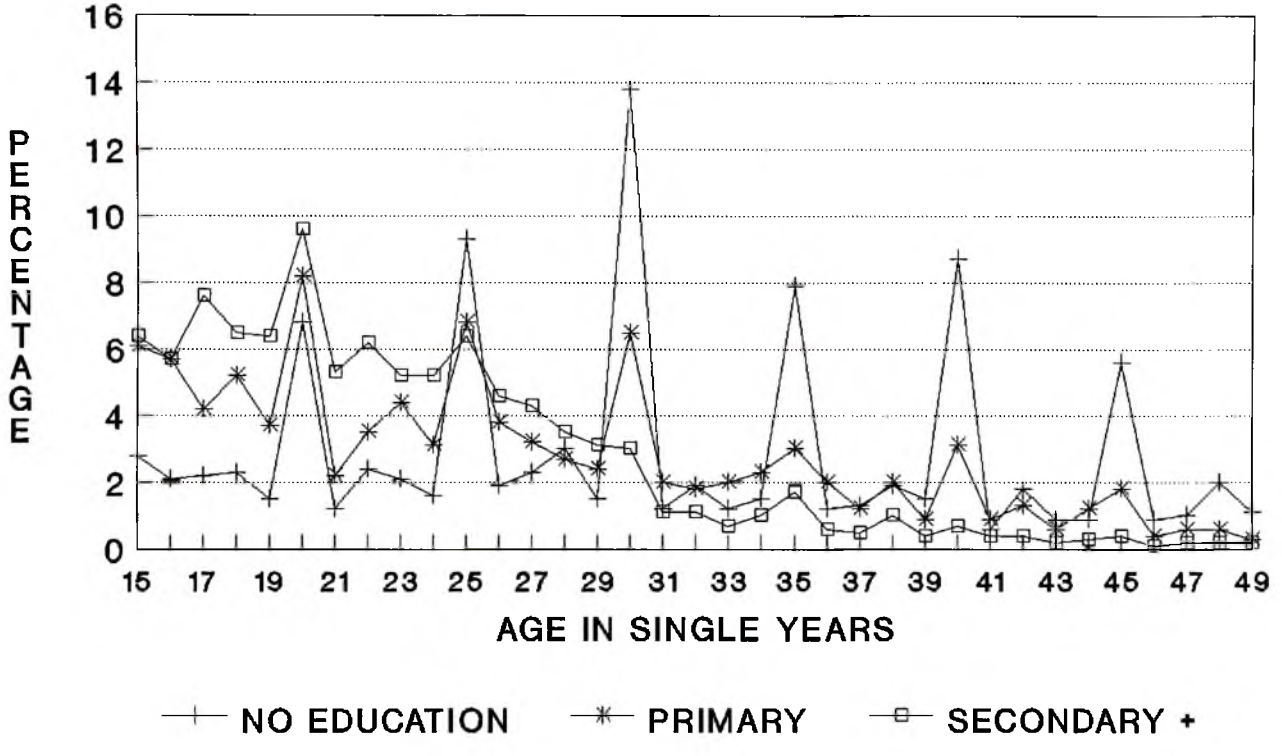
SOURCE: NDHS, 1990 Raw data file.

Figure 2.3 Percentage distribution of women 15-49 years by region of residence



SOURCE: NDHS, 1990 Raw data file

Figure 2.4 Percentage distribution of women aged 15-49 years by educational attainment.



SOURCE: NDHS, 1990 Raw data file

Age reporting is found to be slightly better in the urban than in the rural area. It is worst for respondents in the Northern regions when compared with those in the Southern regions. The largest variation is observed for the level of education. Heaping is found to be least pronounced for respondents with secondary and above education and worst for respondents with no education.

The extent of preference for or avoidance of various digits can be approximated by certain indexes. One of them is the Myers' Index. Theoretically, this index should be 0 when there is no heaping (preference or avoidance) and 90 if all ages are heaped on the same digit. The summary index is interpreted as the minimum proportion of persons enumerated for whom age with an incorrect final digit has been obtained. Myers' index (unblended) is used to gauge the extent of age heaping in the NDHS data. Table 2.4 presents the percent distribution of women 20-49 years by reported terminal digit of age and Myers' Index for the entire country and for selected background characteristics of respondents.

The deliberate restriction of the analysis to age range 20-49 is to allow each digit to have approximately the same chance of 10 percent of occurring in a true distribution. Unblended Myers' Index is used because the blending procedure is not appropriate for the limited age range. The general ranking of Myers' Index indicates low digit preference for indexes less than 10, moderate for indexes ranging between 10 and 19, and high for all indices greater than 20.

Table 2.4 Percent distribution of women aged 20-49 years by reported terminal digit of age and Myers' Index by selected background characteristics.

CHARACT-ERISTICS	TERMINAL DIGIT: 0	1	2	3	4	5	6	7	8	9	MYERS' INDEX
NIGERIA	28.9	5.2	8.0	6.4	6.3	21.3	5.9	5.8	7.5	4.8	30.2
REGION:											
Southeast	25.3	6.5	7.7	7.3	6.6	17.8	8.2	7.6	7.2	5.8	23.1
Southwest	20.9	7.1	10.4	7.0	9.3	18.9	6.8	5.6	8.0	5.9	20.3
Northwest	35.2	3.1	6.5	6.2	4.5	25.5	4.2	4.2	7.8	2.6	40.8
Northeast	34.1	3.9	7.7	4.9	4.9	23.7	3.8	5.4	6.9	4.6	37.9
RESIDENCE:											
Urban	25.3	7.0	10.2	5.7	7.7	17.7	6.9	5.8	7.9	5.6	23.3
Rural	30.0	4.6	7.3	6.6	5.8	22.5	5.6	5.8	7.5	4.8	32.3
EDUCATION:											
No Educ.	32.9	3.4	6.8	4.7	4.5	25.6	4.5	5.2	7.7	4.6	38.6
Primary	23.8	6.8	8.9	9.4	8.8	15.5	8.3	6.5	7.2	4.8	19.3
Secondary+	19.7	10.0	11.5	8.9	9.6	12.5	8.0	7.5	7.0	5.4	13.7
LITERACY:											
Easily	20.0	9.2	10.2	8.4	10.0	13.4	8.3	7.4	7.5	5.7	13.6
With Diff.	23.8	7.3	8.0	8.5	7.1	17.5	11.4	5.5	5.5	5.4	22.7
Not at all	32.5	3.6	7.3	5.4	4.9	24.5	4.3	5.4	7.8	4.4	37.0

NOTE: Educ.-education, Diff.-difficulty.
Source: NDHS, 1990 Raw data file.

Myers' Index (unblended) for the whole country is 30.2. The indexes are lower in the Southern than in the Northern regions. Myers' Index is lower for urban (23.3) than for rural area (32.3). The table also shows that the accuracy of age reporting is positively associated with level of education, with the index ranging from 13.7 for secondary and above and 38.6 for no educational category. Similarly, accuracy of age reporting is also positively associated with level of literacy.

Most demographic data analyses by age are usually presented in five-year age groups. The severity of bias introduced by age heaping at particular ages is more when it results in the displacement of respondents from one age group to another. The age distribution of respondents is therefore assessed for misreporting in five year age groups. In a developing country like Nigeria, with

a young population, the proportion of persons in an age group is expected to decline as age increases if the ages have been accurately reported and recorded and there is no massive age selective migration. It is however observed that the five year age distribution for the total sample is anomalous. The proportion of respondents at age group 15-19 (18.4 percent) is less than those at age group 20-24 and 25-29.

The quality of age reporting in the age groups is also evaluated by comparing calculated age ratios with the expected or standard values. Age ratio is defined as the ratio of the population in the given age group to one third of the sum of the populations in the age group itself, the preceding and the following age groups multiplied by 100. Table 2.5 presents the percentage distribution of respondents in five year age groups and age ratios.

Table 2.5 Percentage distribution of respondents in five-year Age groups and Age Ratios.

AGE GROUP	NO OF WOMEN	PERCENTAGE	AGE RATIO
15-19	1,612	18.4	-
20-24	1,676	19.1	101.4
25-29	1,669	19.0	105.3
30-34	1,410	16.0	104.9
35-39	954	10.9	89.4
40-44	836	9.5	103.9
45-49	624	7.1	-
ALL	8,781	100.0	26.1

Source: NDHS, 1990 Raw data file.

The computed age ratios show that there are excess of respondents in the 20-24, 25-29, 30-34 and 40-44 age groups at the

expense of the other age groups. In other words, age ratios serve primarily as a measure of net age misreporting. This is possibly due to excessive heaping of respondents' ages at 20, 25, 30 and 40 years. Age group 20-24 is fair as it is not significantly higher than 100.

The sum of the absolute deviations of age ratios from 100 for the age groups 20-24 to 40-44 is calculated to be 26.1, yielding an age accuracy index of 5.2. Age accuracy index is an overall measure of accuracy of the age distribution. The value obtained is fair and shows that though some distortions exist in the data, the degree of distortions is still satisfactory.

2.4.3 Birth Date/Age Displacement

The survey collected breastfeeding and health status information on all births that occurred after January 1st, 1985. The deliberate attempt by interviewers to push back the birth dates of older and eligible children by one or two years to avoid the time-consuming work of collecting their health, anthropometric and breastfeeding data, had been observed in DHS-I series. The fear that DHSII series, of which the NDHS is part, may experience increased displacement problems, because the sections of the core questionnaire that depend on children's year of birth are longer than those of the DHSI series, have also been expressed (Arnold, 1990). The implications of this is that the survey may end up collecting a non-representative sample of births, especially those which occurred five years before the survey. If the birth dates are

knowingly displaced (so that some births that actually occurred in year 1985 are recorded by the interviewer as occurring in year 1984), then there will be a shortfall in the aggregate number of births. This would be noticeable in the year 1985 column as would an excess of births in the year 1984 column. Table 2.6 presents the distribution of reported births during the ten years period before the survey according to the year of birth by selected background characteristics of their mothers.

Table 2.6 Number of reported births ten years preceding the survey by year of birth and selected background characteristics of their mothers.

SELECTED CHARACTERISTICS	YEAR OF BIRTH:									
	1981	1982	1983	**1984**	1985	1986	1987	1988	1989	1990
NIGERIA	1,220	1,877	1,509	**2,139**	1,425	1,651	1,676	1,581	1,743	1,077
REGION:										
Southeast	406	525	485	**581**	490	482	533	470	490	251
Southwest	271	360	300	**437**	263	345	310	269	348	148
Northwest	275	468	367	**599**	366	452	477	408	499	366
Northeast	268	469	358	**523**	306	373	355	434	406	313
RESIDENCE:										
Urban	264	393	326	**440**	303	360	352	319	382	196
Rural	955	1,429	1,183	**1,699**	1,122	1,291	1,324	1,262	1,361	881
EDUCATION:										
No education	845	1,323	1,041	**1,540**	912	1,054	1,081	1,021	1,046	713
Primary	305	392	342	**455**	345	430	413	377	441	261
Secondary+	70	107	127	**144**	167	167	182	183	255	104
AGE OF MOTHER:										
15-24	34	112	128	**255**	231	329	377	434	612	362
25-34	599	998	774	**1,166**	762	919	888	820	829	509
35-49	588	713	607	**719**	432	403	411	327	301	206
ACCESS TO MEDIA:										
No Access	561	905	656	**1,096**	633	745	803	709	796	517
Have Access	658	914	854	**1,043**	792	905	871	871	946	558
LITERACY:										
Easily	174	212	246	**257**	279	269	293	281	366	178
With Difficulty	140	168	139	**217**	149	197	199	150	195	133
Not at all	905	1,443	1,124	**1,663**	997	1,185	1,183	1,150	1,181	766

Source: NDHS, 1990 Raw data file.

A close look at the table shows that for the entire country and for each of the selected characteristic, there is a shortfall in the number of births in year 1985 and an unusual excess number

of births in 1984, a year just before the cut-off date. This confirms the fears already expressed based on findings from analysis of DHS-I series. For the whole country and most of the selected characteristics of respondents, there is evidence of birth date and age displacement.

Apart from the general observation, the extent of displacement is further assessed by calculating the birth year ratios for years 1985 and 1984. Birth year ratio is the number of births in year 1985 divided by the average number of births in the year 1984 and year 1986. If there is no birth displacement, heaping on particular years of birth, or an erratic rise or fall in the annual number of births, the value of birth year ratio should be 100. Displacement is suspected if the ratio in the cut-off (1985) is substantially less than 100 and/or the ratio in year 1984 is substantially greater than 100 and no other explanation is evident.

Table 2.7 shows the birth year ratios by survival status of births for selected background characteristics. Columns one and two of the table give the birth year ratios computed for 1985 and 1984. Under normal conditions, birth year ratios should be approximately 100 in the absence of birth year displacement. The suspicion of birth displacement from year 1985 to 1984 is further confirmed by the table, as all ratios in the first column except for those with secondary and above education and the more literate are less than 100, while those in column two are much higher than 100. Except for secondary and above education category and read easily category of literacy which show little evidence of birth displacement, all

other subgroups show severe evidences of birth date displacement. The most severe evidence of displacement is in the Northwest region and among those with no access to media.

Table 2.7 Birth Year Ratios by Survival Status of births and selected background characteristics.

SELECTED BACKGROUND CHARACTERISTICS	CENTRED ON: YEAR 1985	YEAR 1986	CENTRED ON YEAR 1985: FOR LIVING CH/DREN	FOR DEAD CH/DREN
NIGERIA	75.2	145.8	78.8	61.9
REGION:				
SouthEast	92.2	119.2	94.4	79.8
SouthWest	67.3	155.2	72.3	47.1
NorthWest	69.6	163.4	72.1	63.1
NorthEast	68.3	157.5	71.1	57.8
RESIDENCE:				
Urban	75.8	139.9	78.2	59.3
Rural	75.1	147.4	79.0	62.3
EDUCATION:				
No Education	70.3	157.7	75.2	55.6
Primary	78.0	132.5	77.6	79.1
Secondary+	107.4	98.0	106.9	108.1
AGE OF MOTHER:				
15-24	76.0	154.6	84.5	47.5
25-34	71.2	148.5	76.4	50.5
35-49	80.6	130.0	79.8	84.3
LITERACY:				
Easily	106.1	97.9	101.1	155.6
With Difficulty	72.0	150.7	70.4	82.1
Not at all	70.0	156.8	75.4	53.4

Note: The birth year ratio for year x

$$= \frac{B_x}{0.5x(B_{x-1} + B_{x+1})} \times 100 ,$$

where B_x is the number of births for year x.

Source: NDHS, 1990 Raw data file.

If interviewers displace birth dates to avoid asking the large number of health, breastfeeding and anthropometric questions, then

one would expect the displacement of birth dates to be greater for surviving than for dead children, since most of the health questions were not asked about dead children. Birth year ratios computed separately for dead and living children give a contrary result for most of the characteristics, as the problem is greater for dead children than for living children. This may be because interviewers were embarrassed to ask a series of detailed questions about deceased children. Hence the encouragement to transfer them across the cut-off date even though not many questions were supposed to be asked on such children. It may also be because information on birth date of dead children are likely to be less precise, thus interviewers have more leeway in estimating their dates of birth (Arnold, 1990:92).

2.4.4 Breastfeeding Data Evaluation.

The two main types of breastfeeding information collected in NDHS are retrospectively reported duration of breastfeeding and the current status data. Both of them are useful for the estimation of duration of breastfeeding. The main source of bias for current status information is the reporting of children's ages (or dates of birth), while retrospective reports are affected by marked heaping of breastfeeding durations on multiples of six months. Reporting of children's birth dates has been assessed previously. In this section, breastfeeding data will be evaluated, focusing on the frequency of occurrence of missing values and heaping of responses.

Respondents were asked whether or not they ever breastfed each of the children born in the five years preceding the survey. They were also asked whether or not they were still breastfeeding their most recent surviving child at the time of the survey. For children who were no longer being breastfed, retrospective information on how many months each of them was breastfed was also solicited. The structure of the survey instrument appears to assume that only the last borns could still be breastfed at the time of the survey.

2.4.4.1 Missing and Inconsistent values in Breastfeeding Durations.

The duration of breastfeeding of children born in the last five years is evaluated for frequency of missing and inconsistent values taking into consideration the survival status of the children. Table 2.8 presents the percentage distribution of all children born five years preceding the survey according to their reported breastfeeding status, survival status as at the time of the survey and selected characteristics of their mothers.

For living children, the percentage of missing values is found to be 1.9 percent in the total sample. In the health regions, the percentage of missing values ranges between 1.6 percent in the Southwest to 2.2 percent in the Northeast. Proportion of missing values is slightly higher in the rural (2.0 percent) than in the urban (1.6 percent) and is negatively associated with the educational level of mothers. Occurrence of missing values by age of mother appears not to reveal any consistent pattern. While age group 15-24 has 1.6 percent missing value, for age groups 25-34 and

35-49, it was 2.2 and 1.6 percent respectively. The table also indicates that the magnitude of missing values by sex of child shows virtually no difference with 1.9 percent for both male and female children.

Table 2.8 Percentage distribution of children born in the last five years according to their survival status by breastfeeding status at the time of survey and selected characteristics of their mothers.

SELECTED CHARACTERISTICS	LIVING CHILDREN: NEVER B/FED	STILL B/F	RECALL DURATION	MISSING VALUES	TOTAL %	NO OF CH/REN	DEAD CHILDREN: NEVER B/FED	UNTIL DEATH	RECALL DURATION	MISSING VALUES	TOTAL %	NO OF CH/REN
NIGERIA	0.7	34.9	62.5	1.9	100.0	7,881	14.0	50.0	31.5	4.5	100.0	1,276
REGION:												
Southeast	0.5	30.6	66.8	2.1	100.0	2,422	13.9	48.5	33.6	4.1	100.0	297
Southwest	0.3	29.7	68.4	1.6	100.0	1,479	20.8	41.4	30.9	6.9	100.0	204
Northwest	0.7	40.1	57.3	1.9	100.0	2,113	13.0	55.4	30.3	1.3	100.0	454
Northeast	1.3	38.7	57.8	2.2	100.0	1,867	11.4	49.4	31.4	7.8	100.0	320
RESIDENCE:												
Urban	0.5	28.0	69.9	1.6	100.0	1,710	20.5	47.0	24.6	7.9	100.0	202
Rural	0.8	36.8	60.4	2.0	100.0	6,171	12.8	50.6	32.8	3.8	100.0	1,074
EDUCATION:												
No Educ.	0.8	36.6	60.5	2.1	100.0	4,926	11.7	51.8	33.3	3.2	100.0	905
Primary	0.6	33.2	64.6	1.6	100.0	1,994	17.2	50.3	24.3	8.1	100.0	279
Secondary+	0.3	29.6	68.8	1.3	100.0	961	26.9	32.0	35.4	5.7	100.0	92
AGE OF MOTHER:												
15-24	1.1	43.8	53.5	1.6	100.0	2,002	18.5	49.9	25.9	5.8	100.0	342
25-34	0.6	32.3	64.9	2.2	100.0	4,114	11.3	51.6	35.0	2.1	100.0	612
35-49	0.4	30.8	67.2	1.6	100.0	1,765	14.5	47.3	30.6	7.6	100.0	322
SEX OF CHILD:												
Boy	0.7	36.0	61.4	1.9	100.0	3,862	15.4	49.0	31.8	3.8	100.0	701
Girl	0.7	33.8	63.6	1.9	100.0	4,019	12.4	51.2	31.2	5.2	100.0	575
LITERACY:												
Easily	0.4	29.8	68.2	1.6	100.0	1,497	21.8	41.1	29.7	7.4	100.0	171
With Diff.	0.7	32.7	65.0	1.6	100.0	906	15.7	52.2	25.6	6.5	100.0	114
Not at all	0.8	36.6	60.6	2.0	100.0	5,477	12.5	51.3	32.4	3.8	100.0	991

NOTE: B/FED -breastfed; B/F -breastfeeding; CH/REN -children, Educ.-education, Diff.-difficulty.
* -totals for some characteristics are less than the total sample because of missing values.

Source: NDHS, 1990 Raw data file.

Recall duration, which is the proportion of children already weaned whose duration of breastfeeding were recalled at the time of interview is found to be about 62.5 percent for living children in the country. It is higher in the Southern regions than in the

Northern regions. Recall of breastfeeding duration is higher in urban (70.8 percent) than in the rural (61.2 percent), positively associated with educational level of mothers and literacy.

The situation for dead children is observed to be quite different. In the first place, it was possible for mothers to report that they breastfed their children until death. About half of all dead children were breastfed until death. This percentage is similar to the findings obtained in the evaluation of DHS-I series, where in nine surveys, it was reported that at least half of all deceased children were breastfed until death. This figure is however much higher than what was obtained in Ondo Demographic and Health Survey (37.1 percent) (Boerma and Sommerfelt, 1994:114).

In the four health regions, the percentage of deceased children breastfed until death ranges from 41.4 percent in the Southwest to 55.4 percent in the Northwest. The proportion of deceased children breastfed until death is higher in the rural (50.6 percent) than in the urban area (47.0 percent). The proportion of children breastfed until death is found to decrease with increase in the level of education of mothers.

Missing values in breastfeeding duration are found to be as high as 4.5 percent in the entire sample of dead children. In the health regions, it ranges between 1.3 percent for the Northwest and 7.8 percent in the Northeast. The percentage of missing values is higher in the urban areas (7.9 percent) than in rural areas (3.8 percent). The proportions of missing value by mother's educational attainment are 3.2, 8.1, and 5.7 for no education, primary and

secondary and above categories respectively.

The recall duration for dead children is observed to be 31.5 percent for the whole country, ranges between 30.3 and 33.6 percent in the regions. Recall duration is lower in the urban (24.6 percent) than in the rural area (32.8 percent). Similarly, it ranges between 24.3 percent in primary education category to 35.4 percent in the secondary and above category. There is no sex difference in duration recall in the country.

Table 2.9 also shows the percentage of missing values for breastfeeding durations by relative birth order and selected characteristics of respondents.

Table 2.9 Percentage of births in the last five years with missing values for breastfeeding durations variable by relative birth order and selected characteristics of their mothers.

SELECTED CHARACT-ERISTICS	BIRTH ORDER: LAST	NEXT TO LAST	SECOND TO LAST	ALL
NIGERIA	0.1	1.6	0.6	0.7
REGION:				
Southeast	0.1	0.5	0.3	0.2
Southwest	0.0	2.1	1.8	0.8
Northwest	0.0	2.8	0.0	0.9
Northeast	0.3	1.3	1.1	0.8
RESIDENCE:				
Urban	0.1	1.8	1.6	0.8
Rural	0.1	1.6	0.4	0.7
EDUCATION:				
No Education	0.1	1.9	0.4	0.8
Primary	0.1	1.5	1.1	0.6
Secondary+	0.1	0.5	0.7	0.3
LITERACY:				
Easily	0.1	1.0	0.9	0.5
With Difficulty	0.0	1.4	1.8	0.7
Not at all	0.1	1.8	0.3	0.7

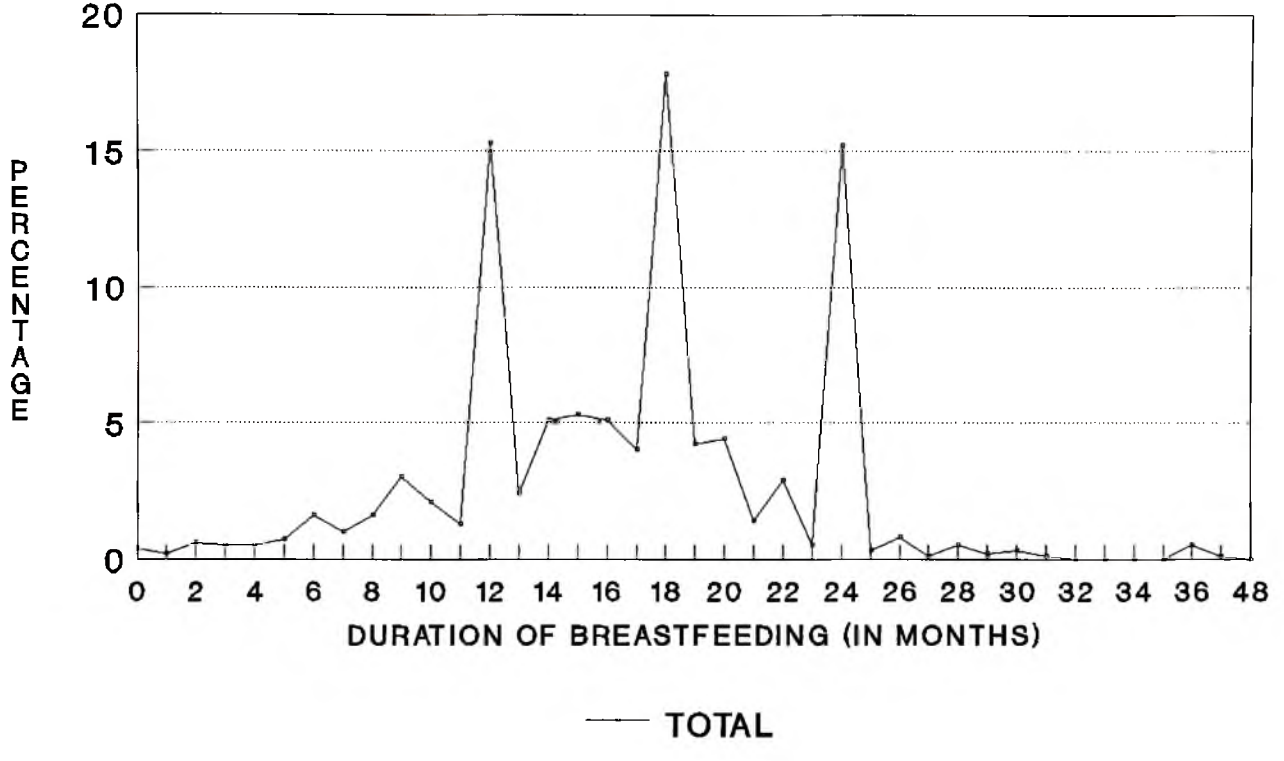
Source: NDHS, 1990 Raw data file.

Generally, for the whole country and selected characteristics of respondents, the proportion of missing values is higher for next-to-last births than for last births. Though the proportion of missing values for second to last is generally lower than those of next to last, they are also observed to be higher than those of last births for most of the selected background characteristics. This is possibly due to the general tendency by the mothers, to forget information concerning births that occurred in the distant past. Mothers are generally more able to provide information on their most recent birth.

2.4.4.2 Heaping of Breastfeeding Durations.

The magnitude of the bias in reporting the duration of breastfeeding is exhibited by the tendency to report the durations in multiples of six months. The marked heaping of breastfeeding duration data on multiples of six months is a phenomenon that has been noted in several studies in developing countries (Page *et al.*,1982:17; Ferry, 1981:13; Jain and Bongaarts, 1981:80-81). The extent of heaping in the NDHS breastfeeding information for children born in the last five years and not being breastfed at the time of the survey is shown in figure 2.5. The figure is characterized by dramatic peaks at multiples of six months (12, 18 and 24 months) as is usually observed with many retrospectively reported duration variables.

Figure 2.5 Percentage distribution of births in the last five years, already weaned by duration of breastfeeding.



SOURCE: NDHS, 1990 Raw data file

Table 2.10 also shows the heaping index at multiples of six months for children with reported breastfeeding durations and heaping at 12, 18 and 24 months by selected characteristics.

Table 2.10 Heaping Index at multiples of 6 for children with reported durations of breastfeeding (including never breastfed children), median duration of breastfeeding and heaping at 12, 18, and 24 months by selected characteristics.

	HEAPING INDEX*	MEDIAN DURATION OF B/F	HEAPING AT:**			NO OF CH/REN
			12 MTHS	18 MTHS	24 MTHS	
NIGERIA	50.8	20.5	2.9	2.5	3.8	5,324
REGION:						
Southeast	48.9	18.0	3.1	2.6	4.4	1,721
Southwest	54.2	17.0	3.0	3.5	3.8	1,072
Northwest	51.7	22.7	2.6	2.2	4.0	1,353
Northeast	49.5	22.1	2.6	2.3	3.5	1,179
RESIDENCE:						
Urban	46.9	15.8	2.8	2.9	3.6	1,245
Rural	52.0	21.1	3.0	2.4	3.9	4,080
EDUCATION:						
No Education	54.7	22.2	3.1	2.5	3.8	3,272
Primary	45.1	19.1	2.8	2.3	4.0	1,353
Secondary+	43.9	15.1	2.9	2.9	(4.8)	699
AGE:						
15 - 24	47.5	19.9	2.9	2.2	3.8	1,162
25 - 35	49.7	19.2	2.9	2.6	3.6	2,885
35 - 49	56.3	21.3	3.0	2.7	4.3	1,277

NOTE: * Heaping index = @Sum(6+12+18+24+30+36)/@Sum(All 0-36)
**Heaping at 12 months:5 x N(12months)/N(10,11,12,13,14). If no heaping at all, then measure equals 1; if all responses heaped, then measure is 5.
Median duration of breastfeeding is based on current status data including all children born two years before the survey.
( ) N < 50.
Source: NDHS, 1990 Raw data file.

Heaping index in this case can be interpreted as the percentage of children having their breastfeeding durations reported at exactly 6, 12, 18, 24, 30 and 36 months. When there is no tendency to report durations in multiples of six months, one-sixth or about 16 percent of the women are likely to report the duration of breastfeeding in multiples of six months.

In Nigeria, 50.8 percent of children had their breastfeeding durations reported at exactly 6, 12, 18, 24, 30 and 36 months. In the four health regions, the heaping index is found to range between 48.9 percent in the Southeast and 54.2 percent in the Southwest. Heaping is slightly less severe in the urban (46.9 percent) than in the rural (52.0 percent). Heaping index is observed to decrease with increase in the level of education of mothers, suggesting that heaping of breastfeeding durations are least severe with women with secondary and above education. Heaping index is found to increase with increasing age of mothers. This may be because older mothers compared to younger mothers are possibly less educated.

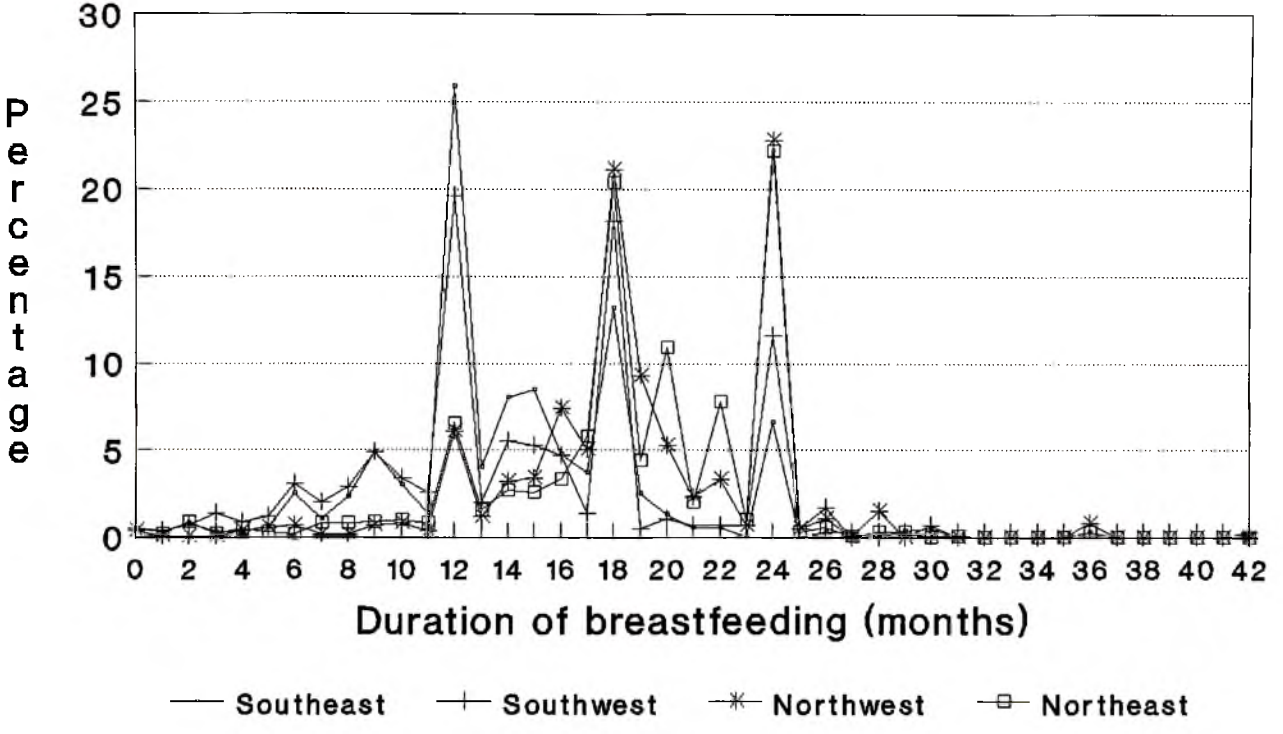
The amount of heaping is also separately assessed for durations at 12, 18 and 24 months by considering the number of responses on the digit of interest in relation to the surrounding digits. For instance, the number of responses at 18 months is multiplied by 5 and divided by responses at 16 to 20 months. If all responses are heaped at 18, the measure will be 5. If on the other hand, there is no heaping at all, the measure will be equal to 1. Table 2.10 shows that heaping is prevalent in the country and for all selected characteristics. It is observed to be more serious at longer durations. This observation is in agreement with the findings of the evaluation of DHS-I surveys (Boerma and Sommerfelt, 1994:117). The number of responses at 12 months is about 3 times higher than expected. Heaping is however less strong at 18 months, but more pronounced at 24 months than at 12 months. For the entire

country and for most of the characteristics, the number of responses at 24 months is at least four times higher than expected.

Figures 2.6 to 2.8 give the graphical representation of the percentage distribution of children in Nigeria by duration of breastfeeding and selected characteristics of respondents. Peaks at multiples of six months are observed to vary widely. For the regions, heaping of duration responses appears to be more severe in the Northern than the Southern regions. With respect to current place of residence, figure 2.7 indicates higher heaping for urban respondents at lower breastfeeding durations and vice-versa at higher breastfeeding durations. Figure 2.8 shows that heaping of breastfeeding durations by women with secondary and above education appears to be concentrated on 12 months as opposed to those with primary and no education which exhibit marked heaping at 12, 18 and 24 months.

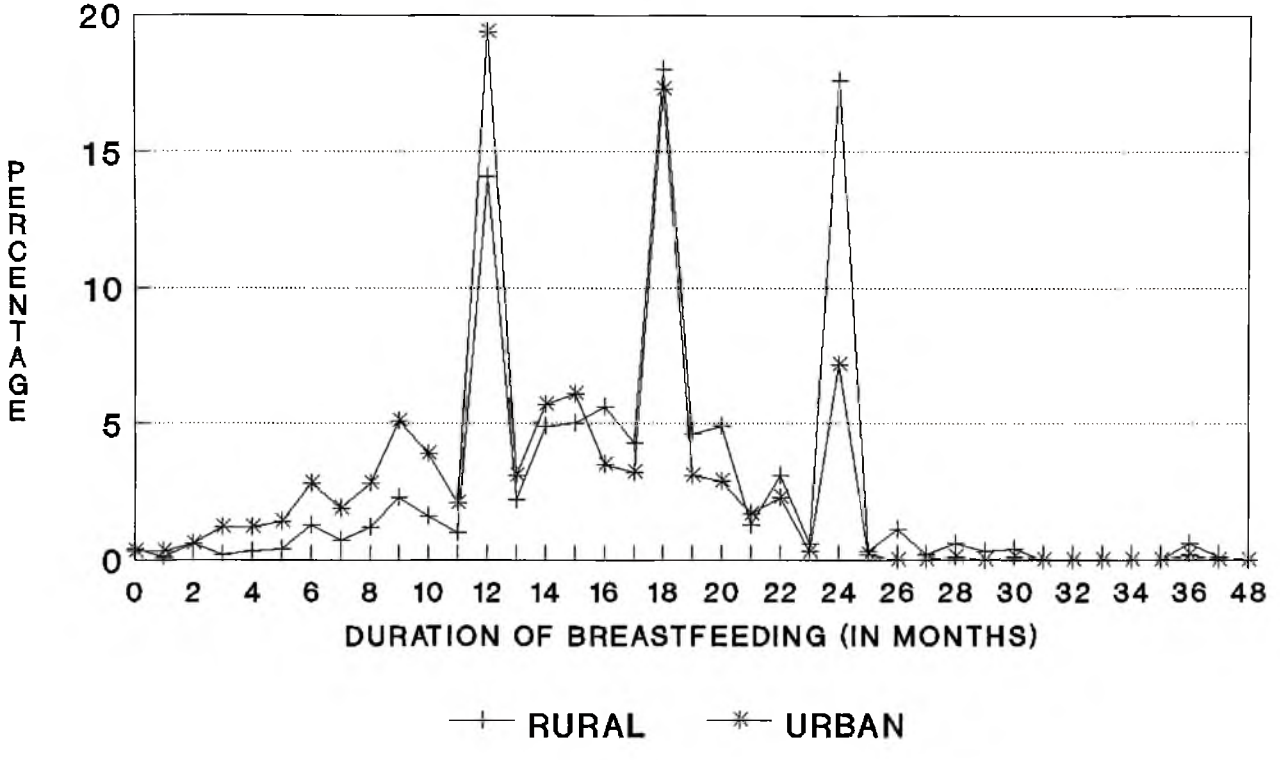
It has been suggested that the difference between the observed and the expected percentage of women reporting breastfeeding durations in multiples of six months are not entirely attributable to digit preference (Jain and Bongaarts, 1981:81). The suggestion is premised on the existence of some cultural preferences or norms to breastfeed a child for twelve or twenty four months. However, even when an allowance is made for those cultural preferences, the magnitude of bias as shown in figure 2.5 appear to be very severe. Therefore, given this magnitude of bias, the choice of prevalence-incidence method for the estimation of the mean duration of breastfeeding, will free our estimates from the effects of heaping.

Figure 2.6 Percentage distribution of births in the last five years, weaned, by duration of breastfeeding by region.



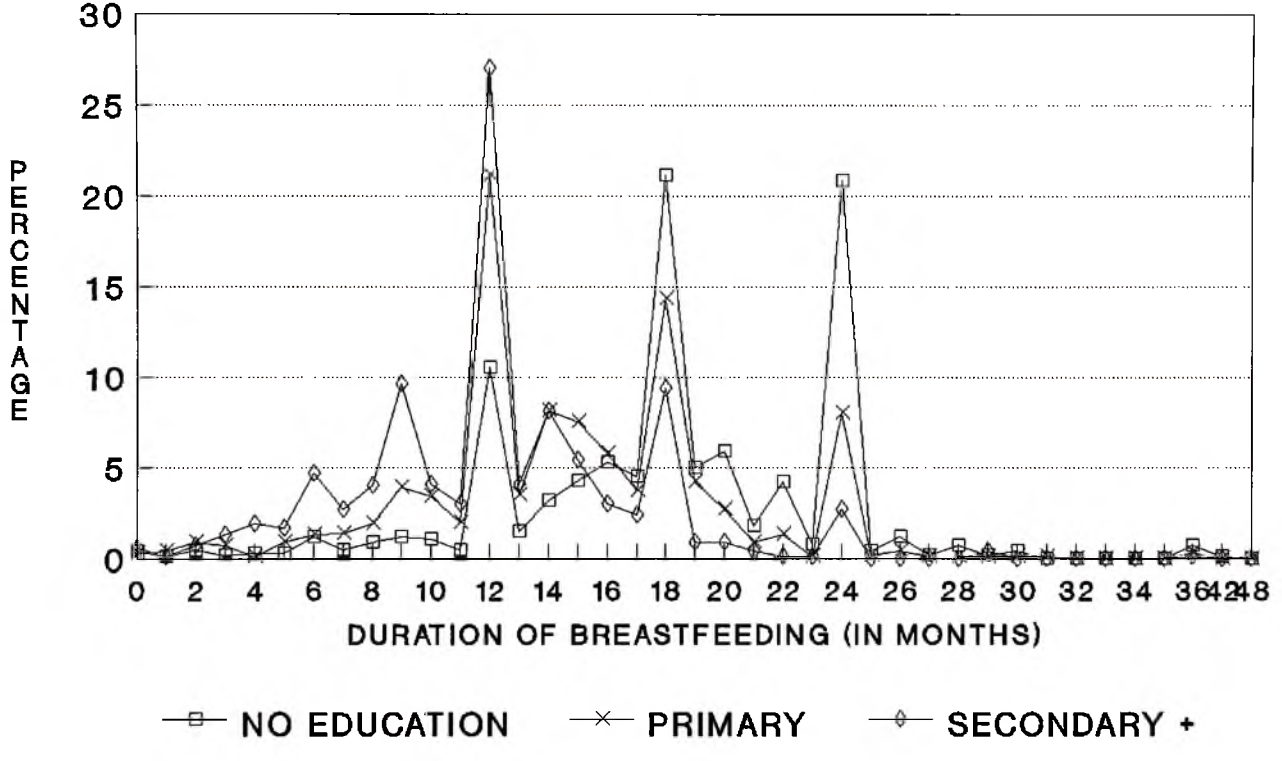
SOURCE: NDHS, 1990 Raw data file

Figure 2.7 Percentage distribution of births in the last five years, weaned by duration of breastfeeding and residence.



SOURCE: NDHS, 1990 Raw data file.

Figure 2.8 Percentage distribution of births last five years, weaned, by duration of breastfeeding and education.



SOURCE: NDHS, 1990 Raw data file

Table 2.11 presents heaping at 12 and 18 months for breastfeeding durations by mother's level of education and selected characteristics.

Table 2.11 Heaping at 12 and 18 months for breastfeeding durations by mothers' level of education: The heaping index by mothers' education relative to the overall heaping index, and extent of heaping at 12 and 18 months by selected characteristics.

	HEAPING INDEX RATIO:			HEAPING AT 12 MONTHS:			HEAPING AT 18 MONTHS:			NO OF
	NO EDUC.	PRIM.	SEC+	NO EDUC.	PRIM.	SEC+	NO EDUC.	PRIM.	SEC+	CH/DREN
NIGERIA	1.08	0.89	0.86	3.12	2.77	2.90	2.52	2.33	2.87	5,324
REGION:										
Southeast	1.16	0.87	0.94	3.53	2.72	3.09	2.86	3.36	(2.14)	1,721
Southwest	1.22	0.94	0.81	3.56	2.85	2.73	3.80	3.01	(3.69)	1,072
Northwest	1.00	1.04	0.68	2.63	(2.81)	(2.27)	2.21	(2.13)	(1.50)	1,353
Northeast	1.05	0.71	0.68	2.48	(3.00)	(2.69)	2.39	(1.54)	(1.88)	1,179
RESIDENCE:										
Urban	1.04	1.02	0.94	2.47	2.76	3.07	2.61	3.25	(3.60)	1,245
Rural	1.07	0.85	0.84	(3.20)	2.76	2.71	2.50	2.04	(2.43)	4,080
AGE OF MOTHER:										
15-24	1.17	0.84	0.79	3.55	2.66	2.54	2.27	(1.88)	(2.37)	1,162
25-34	1.06	0.91	0.91	3.09	2.78	2.98	2.62	2.34	(2.83)	2,885
35-49	0.98	0.92	(1.07)	2.97	(2.88)	(4.33)	2.52	(3.00)	(4.12)	1,277

NOTE: * Heaping index @Sum(6+12+18+24+30+36)/@Sum(All 0-36).
**Heaping at 12 months: 5xN(12months)/N(10,11,12,13,14). If no heaping at all, then measure equals 1; if all responses heaped, then measure is 5. Same for 18 months. ( ) N < 50.
EDUC.-education, PRIM.-primary, SEC+-secondary+, CH/DREN- children.
Source: NDHS, 1990 Raw data file.

The table gives the heaping index ratio by mother's education relative to the overall heaping index and the extent of heaping at 12 and 18 months. The table clearly shows that the overall heaping index is highest for the no education category and lowest for the secondary and above education category for the country and most of the selected characteristics of respondents. These observed differences may however be due to differences in duration of breastfeeding as women with less education breastfeed for longer durations and since heaping is more pronounced at longer durations of breastfeeding, the heaping may be amplified.

The table also shows heaping at 12 and 18 months separately. Considering the magnitude of heaping by the educational level of respondents, the overall heaping is slightly higher for women with no education and decreases with increased level of education. This is observed for the regions, current place of residence and age of mothers. If heaping is considered as a good indicator of the quality of breastfeeding information, then the reported durations by mothers with no education or low levels of education are less accurate than those reported by mothers with higher levels of education.

2.5 SUMMARY

Discussions in this chapter have focussed primarily on data sources, evaluation and methodology for the study. An attempt has been made to evaluate the quality of NDHS data, especially age of respondents, birth date reporting for respondents and their children and breastfeeding information for births in the last five years preceding the survey.

The evaluation of the respondents' age data shows that the quality of age reporting in the country is still poor. About half of the women could give their exact dates of birth. There are substantial heaping of age on digits ending in 0 and 5 and consequent avoidance of other digits. It is observed that there is particularly marked heaping on age 30. The graphical representation of the age distribution of respondents for the whole country and for some selected characteristics reveals saw-edged patterns. Age

misreporting is found to be higher in the North than in the South, higher in the rural than in urban areas, higher among older than younger women and is more characteristic of women with none or less education. The same pattern is observed with respondents' birth date reporting. The general assessment is that it is poor, as less than two-thirds of respondents could report their exact dates of birth.

The Myers' Index for the whole country indicates that about 30 percent of respondents have incorrect final digit. Apparently, the level of education, literacy and place of residence are found to be associated with the quality of age reporting. Heaping is less pronounced among urban respondents and the more educated or literate women.

The evaluation of data on birth date reporting shows that the quality of reporting is higher for children than for women. The overall level of completeness of children's birth date information is observed to be above 80 percent and vary widely between regions, place of residence, age of respondents and between the educational categories. Dead children have a higher level of incompleteness of birth date reporting. Birth dates of children born to urban and more educated or literate women were more completely reported than those of rural, less educated women and illiterates. The magnitude of incompleteness of birth date information increases as one goes further away from the year of interview. This suggests the general tendency by respondents to forget birth date information of births they had sometime back before the interview. This is particularly

before the interview. This is particularly more common with rural respondents and those with no education.

The evaluation also presents evidence of bias in births reporting. Some births are deliberately pushed back a year or two thereby resulting in a deficit of births five years before the survey and an excess, in the six years before the survey.

Occurrence of missing values in breastfeeding durations are generally low in the country, but found to be higher for dead than for living children. There is generally a large increase in the proportion of births with missing values for breastfeeding durations with increasing birth order.

Heaping of breastfeeding durations at multiples of six months is observed to be pronounced in the country. It varies widely among selected background characteristics of respondents like education and current place of residence.

CHAPTER III

CHARACTERISTICS OF SURVEY RESPONDENTS

3.1 INTRODUCTION

The eligible respondents in the NDHS are all women aged 15 to 49 years in the sampled areas. The description of the background characteristics of these respondents is expected to assist in the interpretation of findings that will emanate from the study. The background characteristics include age, parity, level of education, literacy, current place of residence, marital status, type of union, place of work, occupation, childhood place of residence, region of residence and religion. Others are access to mass media, husband's education and occupation, environmental factors and ownership of household facilities. Some selected characteristics of births in the last five years are also examined. As expected, many of the background characteristics of respondents are associated with one another. Consequently, some of these interrelationships will also be highlighted in the course of the discussions.

The percentage distribution for some of the selected characteristics do not add up to 100 due to rounding problems. In addition, the total number of respondents for some of the selected characteristics are slightly less than the total number of eligible respondents (8,781) because of missing cases.

3.2 AGE OF RESPONDENTS

Age is one of the most important variables in a study of this nature, since almost all analyses of data depend on respondent's

age. The percentage distribution of respondents according to five-year age groups and selected background characteristics is presented in table 3.1.

Table 3.1 Percentage distribution of respondents according to five-year age groups by selected background characteristics.

CHARACTERISTICS	FIVE-YEAR AGE GROUPS:							TOTAL %	NO OF WOMEN
	15-19	20-24	25-29	30-34	35-39	40-44	45-49		
NIGERIA	18.4	19.1	19.0	16.1	10.9	9.5	7.1	100.0	8.781
REGION:									
Southeast	20.6	17.6	18.2	15.3	12.0	9.5	6.9	100.0	2,769
Southwest	19.9	19.7	17.4	14.1	11.7	10.0	7.1	100.0	1,915
Northwest	14.7	19.6	21.7	18.0	9.7	9.8	6.4	100.0	2,098
Northeast	17.6	20.0	18.8	16.9	9.6	8.8	8.2	100.0	1,999
RESIDENCE:									
Urban	21.1	21.2	19.4	15.0	10.0	8.0	5.3	100.0	2,187
Rural	17.4	18.4	18.9	16.4	11.1	10.0	7.7	100.0	6,594
EDUCATION:									
No Education	10.9	14.0	18.1	19.7	13.8	13.0	10.6	100.0	5,020
Primary	24.9	21.4	19.0	14.7	9.2	7.1	3.7	100.0	2,099
Secondary+	32.7	31.4	21.9	6.8	4.2	2.0	1.0	100.0	1,662

SOURCE: NDHS, 1990 Raw data file.

More than half of respondents (56.5 percent) are almost equally allocated to the three age groups below 30. As expected, the distribution conforms to a pattern characteristic of a high fertility population. The relative sizes of women as age increases decline, with 45-49 year age group having the lowest proportion of respondents. Unexpectedly however, the proportion of respondents aged 15-19 is lower than those aged 20-24. This may likely be a manifestation of the problem of age misreporting as earlier mentioned under age data appraisal. The pattern of declining percentage with increasing age is however maintained after age 25. The table also presents the distribution of respondents according to age by education, region and current place of residence. The expected pattern of declining percentage with increase in age did

not strictly hold except in the Southwest region. The expected pattern is however maintained after age 20 in all regions. For the current place of residence, the expected pattern of declining percentage with increasing age also did not strictly hold.

The age distribution according to respondents' educational attainment shows that more than 85 percent of women with secondary and above education are below 30 years of age compared to about 65 percent observed for primary education and less than 35 percent for women with no formal education.

3.3 PARITY

The distribution of respondents according to parity is shown in table 3.2. Almost a quarter (24.2 percent) of respondents have zero parity and almost an equivalent proportion (23.9 percent) have six or more children. More than fifty percent of respondents have less than three children as at the time of survey. The table also shows that while about 30 percent of respondents in the Southern regions have zero parity, less than 20 percent in the Northern regions have zero parity. In all the regions, over 20 percent have over six children. Distribution according to current place of residence shows that 33.4 percent of respondents in the urban areas have zero parity compared to 21.2 percent obtained for the rural areas. Proportion of respondents with six and above parity is lower in the urban areas (18.4 percent) than rural areas (25.8 percent).

With respect to childhood place of residence, the table shows higher percentage of respondents with zero parity in the urban than

in the rural area. About 26 percent of respondents who lived in rural areas during their childhood days have six and above parity compared to 19.9 percent obtained for those who lived in urban areas.

Table 3.2 Percentage distribution of respondents according to parity by selected background characteristics.

CHARACTERISTICS	PARITY:							TOTAL %	NO OF WOMEN
	0	1	2	3	4	5	6+		
NIGERIA	24.2	12.1	11.4	10.2	9.8	8.3	23.9	100.0	8,781
REGION:									
Southeast	29.0	9.2	10.0	8.4	8.4	8.7	26.2	100.0	2,769
Southwest	31.9	10.8	8.6	7.7	9.8	8.6	22.6	100.0	1,915
Northwest	16.4	14.6	13.5	12.5	11.2	8.2	23.7	100.0	2,098
Northeast	18.6	14.9	13.9	12.5	10.4	7.5	22.2	100.0	1,999
RESIDENCE:									
Urban	33.4	11.5	10.4	8.9	9.1	8.2	18.4	100.0	2,187
Rural	21.2	12.3	11.8	10.6	10.1	8.3	25.8	100.0	6,594
CHILDHOOD RESIDENCE:									
Urban	33.6	11.7	10.3	9.2	9.7	8.2	19.9	100.0	2,624
Rural	20.3	12.3	11.8	10.6	10.2	8.6	26.3	100.0	6,148
EDUCATION:									
No Education	12.4	11.5	11.6	11.7	11.4	10.0	31.5	100.0	5,020
Primary	27.8	12.3	11.5	9.5	9.4	7.8	21.7	100.0	2,099
Secondary+	55.5	13.9	10.9	6.3	5.8	3.9	3.8	100.0	1,662

SOURCE: NDHS, 1990 Raw data file.

The table also shows that the proportions of respondents with parities 0 or 1 increase with increase in the level of education. For example, while 55.5 percent of respondents with secondary and above education have zero parity, 11.5 and 12.3 percent of those with no education and primary education respectively have zero parity. At parity 2 and above, the proportion of respondents decreases with increase in the level of education. For example, while 31.5 percent of women with no education have parity six and above, 21.7 and 3.8 percent of women with primary and secondary and above respectively have parity six and above.

3.4 MARITAL STATUS

In most human societies, childbearing takes place in more or less stable sexual unions, though it is by no means confined to such unions. Entry into these unions is largely determined by the religious, legal and other socio-cultural characteristics of the society. Such unions are called marriages. Marriage is a very important factor in population dynamics as it directly affects fertility and other demographic processes. The continuous exposure to the risk of childbearing is brought about immediately a woman enters a marital union. The proportion married is one of the intermediate fertility variables through which background variables affect fertility.

Table 3.3 presents the distribution of respondents according to marital status and selected background characteristics. The table shows that almost 80 percent of surveyed women are currently married while about 17 percent have never been married. The percentage of never married women is highest for women aged 15-19 years (61.4 percent) as expected and it decreases rapidly as age of respondents increases. This is as expected as some of the respondents at lower age groups are possibly still in school or learning a trade before marriage. At higher ages, many of them finish or drop out of school, finish learning a trade and are by that time matured enough to get married. Consequently, the percentage of married women is observed to be lowest for women aged 15-19 (37 percent), increases rapidly reaching 95.6 percent for

women aged 30-34 and then declining thereafter reaching 86.9 percent at age 45-49.

Table 3.3 Percentage distribution of respondents according to current marital status by selected background characteristics.

CHARACTERISTICS	MARITAL STATUS:			TOTAL %	NO OF WOMEN
	Never Married	Currently Married	No longer in union		
NIGERIA	17.2	78.4	4.4	100.0	8,781
AGE OF RESPONDENTS:					
15-19	61.4	37.0	1.6	100.0	1,616
20-24	21.7	76.3	2.0	100.0	1,677
25-29	7.9	89.4	2.7	100.0	1,668
30-34	0.9	95.6	3.5	100.0	1,414
35-39	1.2	93.5	5.3	100.0	957
40-44	0.3	87.5	12.3	100.0	834
45-49	0.1	86.9	13.0	100.0	623
REGION:					
Southeast	26.2	65.0	8.8	100.0	2,768
Southwest	28.7	67.2	4.1	100.0	1,915
Northwest	6.0	92.6	1.4	100.0	2,098
Northeast	5.7	92.5	1.9	100.0	1,999
RESIDENCE:					
Urban	28.1	67.5	4.5	100.0	2,187
Rural	13.6	82.0	4.4	100.0	6,594
EDUCATION:					
No Education	3.5	91.8	4.6	100.0	5,020
Primary	22.5	71.9	5.6	100.0	2,099
Secondary+	52.0	45.8	2.2	100.0	1,662

SOURCE: NDHS, 1990 Raw data file

The observed decline at higher ages may be because some of the women who were once married are now no longer in union either as a result of divorce or separation or due to the loss of their husbands through death.

It is also observed that the percentage of women no longer in union is lower (less than 6 percent) for all age groups below 40 years. The percentage of women no longer in union is however 12.3

and 13.0 percent for age groups 40-44 and 45-49 respectively. All these are indicative of relatively high marital stability in the country and can partly be responsible for the prevailing high fertility.

While over 90 percent of respondents in the Northern regions are currently married, in the Southern regions, the proportion currently married is below 70 percent. Similarly, more than one quarter of respondents from the Southern regions are never married compared to only about 6 percent in the North. Proportions of respondents no longer in union are higher in the South than in the North. This may be reflective of relatively higher marital stability in the Northern compared to the Southern part of the country.

The table also shows that the proportion of respondents who are currently married is higher in the rural areas (82 percent) than urban areas (67.5 percent) and decrease with increase in the level of education. More than half of the respondents with secondary and above education are never married compared to 22.5 and 3.5 percent for those with primary and no education respectively.

3.5 TYPE OF UNION

Situations where more than one woman is married to a man are very common in Nigeria. It is widely encouraged and practised by Muslims and among the more traditional members of the society whether or not they belong to religious groups that condemn it

(National Population Bureau, 1984:47). In many societies in Tropical Africa, the existence of polygyny is considered to be a factor that greatly facilitates observance of postpartum taboos, one of which is that women should abstain from sexual relations for the whole or for at least a part of the breastfeeding period (Orubuloye, 1987:337; Lesthaeghe *et al.*,1981). Table 3.4 presents the distribution of respondents according to type of union by selected background characteristics.

Table 3.4 Percentage distribution of respondents according to type of union by selected background characteristics.

BACKGROUND CHARACTERISTICS	TYPE OF UNION:		TOTAL %	NO OF WOMEN
	Polygyny	Monogamy		
NIGERIA	41.0	59.0	100.0	6,864
RESIDENCE:				
Urban	33.8	66.2	100.0	1,468
Rural	43.0	57.0	100.0	5,395
REGION:				
Southeast	30.6	69.4	100.0	1,794
Southwest	38.7	61.3	100.0	1,278
Northwest	49.7	50.3	100.0	1,943
Northeast	43.6	56.4	100.0	1,849
RELIGION:				
Christianity	30.8	69.2	100.0	2,708
Islam	47.9	52.1	100.0	3,805
Others	46.0	54.0	100.0	344
EDUCATION:				
No Education	47.9	52.1	100.0	4,605
Primary	29.9	70.1	100.0	1,504
Secondary +	21.2	78.8	100.0	755

NOTE: * total for religion is less than total sample because of missing values.
SOURCE: NDHS, 1990 Raw data file.

The table indicates that in Nigeria 41.0 percent of currently married women are in polygynous unions, while 59.0 percent are in monogamous unions. The percentage of respondents in polygynous

unions is lower in urban areas (33.8 percent) than rural areas (43.0 percent). This is partly because rural areas are more traditional, an attribute that is more favourably disposed to polygyny. There is higher prevalence of polygyny in the North than in the South. This is as expected as Islam is more prevalent in the North. Islam is widely recognized to encourage polygyny. The prevalence of Christianity in the South also may have contributed to the incidence of monogamy in the South. There is higher prevalence of polygyny among muslims than christians, thus lending support to the fact that Islam encourages polygyny. Percentage of respondents in polygynous unions appears to decrease with increase in educational attainment of respondents, while incidence of monogamy increases with increase in level of education.

3.6 REGION OF RESIDENCE

The states making up the country had been grouped into four broad geographic regions by the Federal Ministry of Health and called health regions. They are Southeast, Southwest, Northeast and Northwest. The grouping has been described as purely arbitrary, pragmatic and of analytical, policy formulation and implementation importance since the components of each region are geographically and to a lesser extent culturally and socio-economically homogeneous (National Population Bureau, 1984:57). The component states making up each of the regions are included in appendix 3.1. Table 3.5 presents the distribution of respondents according to region of residence by selected background characteristics.

The table shows that almost a third of the total respondents (31.5 percent) reside in the Southeast with the remaining number almost equally divided among the Southwest (21.8 percent), Northwest (23.9 percent) and Northeast (22.8 percent). While over 70 percent of women with no education reside in the Northern regions, more than 80 percent of respondents with primary and secondary and above education reside in the Southern regions. Over 70 percent of urban respondents are from the Southern regions and about the same proportion lived in the rural area during their childhood days.

Table 3.5 Percentage distribution of respondents according to region of residence by selected background characteristics.

SELECTED CHARACTERISTICS	REGION OF RESIDENCE:				TOTAL	NO OF
	S/EAST	S/WEST	N/WEST	N/EAST	%	WOMEN
NIGERIA	31.5	21.8	23.9	22.8	100.0	8,781
RESIDENCE:						
Urban	20.3	53.0	15.0	11.6	100.0	2,187
Rural	35.2	11.5	26.8	26.5	100.0	6,594
CHILDHOOD RESIDENCE:						
Urban	22.6	49.8	16.5	11.1	100.0	2,624
Rural	35.3	9.8	27.1	27.8	100.0	6,148
EDUCATION:						
No Education	20.0	10.0	36.7	33.4	100.0	5,020
Primary	53.6	27.2	8.0	11.3	100.0	2,099
Secondary+	38.5	50.8	5.4	5.3	100.0	1,662

NOTE: N/EAST -Northeast; N/WEST -Northwest; S/EAST -Southeast; S/WEST -Southwest, * total for childhood residence is less than total sample because of missing values.
SOURCE: NDHS, 1990 Raw data file.

3.7 CURRENT PLACE OF RESIDENCE

The enumeration areas comprising the NDHS sample were classified as either rural or urban. The utility of this

classification in the present study is that it will help capture the place of residence variation in breastfeeding behaviour.

Table 3.6 presents the distribution of respondents according to their current place of residence and some selected background characteristics.

Table 3.6 Percentage distribution of respondents according to current place of residence by selected characteristics.

SELECTED CHARACTERISTICS	RESIDENCE:		TOTAL	NO OF
	Urban	Rural	%	WOMEN
NIGERIA	24.9	75.1	100.0	8,781
REGION:				
Southeast	16.0	84.0	100.0	2,769
Southwest	60.6	39.4	100.0	1,915
Northwest	15.7	84.3	100.0	2,098
Northeast	12.7	87.3	100.0	1,999
CHILDHOOD RESIDENCE:				
Urban	63.9	36.1	100.0	2,624
Rural	8.3	91.7	100.0	6,148
EDUCATION:				
No Education	13.6	86.4	100.0	5,020
Primary	27.8	72.2	100.0	2,099
Secondary+	55.5	44.5	100.0	1,662

SOURCE: NDHS, 1990 Raw data file.

The table shows that only a quarter (24.9 percent) of respondents reside in the urban area while three quarters (75.1 percent) are rural residents. The table also shows that while over 60 percent of respondents from the Southwest region reside in urban areas, more than 80 percent of respondents in the Southeast, Northwest and Northeast are rural residents.

3.8 CHILDHOOD PLACE OF RESIDENCE

This is the type of place the respondents lived for most of the time as a young girl. This variable can help capture values acquired during childhood which are not necessarily captured by the woman's current place of residence. During the childhood days children form opinions which are usually in conformity with those of their immediate environments.

Table 3.7 presents the percentage distribution of respondents according to their childhood place of residence by region and current place of residence. About 70 percent of respondents lived in the rural areas in their childhood days compared to about 30 percent who lived in urban areas in their childhood days.

Table 3.7 Percentage distribution of respondents according to childhood place of residence by region and current place of residence.

SELECTED CHARACTERISTICS	CHILDHOOD RESIDENCE:		TOTAL %	NO OF WOMEN
	Urban	Rural		
NIGERIA	29.9	70.1	100.0	8.772
REGION:				
Southeast	21.5	78.5	100.0	2,767
Southwest	68.3	31.7	100.0	1,912
Northwest	20.7	79.3	100.0	2,097
Northeast	14.5	85.5	100.0	1,996
RESIDENCE:				
Urban	76.7	23.3	100.0	2,186
Rural	14.4	85.6	100.0	6,586

SOURCE: NDHS, 1990 Raw data file

The table also shows that except in the Southwest, over three quarters of respondents in each of the regions lived in the rural areas during their childhood days. In the Southwest, about 68.4 percent of respondents lived in the urban areas during their

childhood days, while 31.7 percent lived in the rural areas.

An overwhelming proportion (85.6 percent) of respondents currently living in the rural areas lived in rural areas during their childhood days, just as over 76 percent of urban respondents had lived in urban areas during their childhood days. Similarly, while 14.4 percent of respondents in rural areas lived in the urban areas during their childhood days, as high as 23.3 percent of urban respondents lived in the rural areas during their childhood days. This may likely be one of the manifestations of rural to urban migration which is more common than urban to rural migration.

3.9 RELIGION

The importance of religion in the present study is better appreciated when one is mindful of the demographic impact that the teachings of the two major religions in Nigeria would have. While Islam is widely recognized to encourage polygyny and long durations of breastfeeding, christianity is known to preach monogamy. Table 3.8 presents the distribution of respondents according to their religious affiliation and some selected characteristics.

Most of the respondents reported either Islam or Christianity with both categories almost equal. Those in other religions account for about 4.7 percent. While christianity is predominant in the Southern regions, Islam is predominant in the North. There are more christians in urban while muslims are more in rural areas. More than three quarters of respondents with either primary or secondary education are christians. This is reflective of the influence of

the early christian missionaries. In contrast, more than two thirds of the respondents are muslims.

Table 3.8 Percentage distribution of respondents according to Religion by Region and Current place of residence.

BACKGROUND CHARACTERISTICS	RELIGION:			TOTAL %	NO OF WOMEN
	Christ-ianity	Islam	Others		
NIGERIA	47.7	47.6	4.7	100.0	8.775
REGION:					
Southeast	88.9	1.4	9.7	100.0	2,766
Southwest	66.7	28.6	4.7	100.0	1,915
Northwest	5.5	94.1	0.4	100.0	2,095
Northeast	16.8	80.8	2.4	100.0	1,999
RESIDENCE:					
Urban	56.9	41.9	1.2	100.0	2,186
Rural	44.6	49.5	5.9	100.0	6,589
EDUCATION:					
No Education	24.9	68.7	6.4	100.0	5,016
Primary	75.7	20.4	3.9	100.0	2,097
Secondary+	81.2	18.0	0.8	100.0	1,662

SOURCE: NDHS 1990 Raw data file.

3.10 EDUCATIONAL ATTAINMENT AND LITERACY

The distribution of respondents according to educational attainment and literacy is presented in table 3.9. The proportion of respondents with no education accounts for almost sixty percent (57.2 percent) of the total sample. This figure is almost the same as what was obtained in the 1981/82 NFS (58.9 percent of the sampled women had no formal education). The table also shows that less than one quarter (23.9 percent) of respondents have primary education, while about 19 percent have attained secondary and above education. The proportion of women with no education increases with age. Younger women are more educated than the older women as

depicted by higher percentages of women at lower ages with either primary or secondary and above education.

Table 3.9 Percent distribution of respondents according to level of education and literacy by selected background characteristics.

CHARACT-ERISTICS	EDUCATIONAL LEVEL:			TOTAL	LITERACY:			TOTAL	NO OF
	No Educ.	Prim.	Sec.+	%	Easily	W/diff.	N/at all	%	WOMEN
NIGERIA	57.2	23.9	19.0	100.0	25.6	11.3	63.0	100.0	8,781
AGE:									
15-19	33.8	32.5	33.7	100.0	41.7	15.9	42.4	100.0	1,612
20-24	42.1	26.8	31.1	100.0	37.8	12.3	49.8	100.0	1,676
25-29	54.3	23.9	21.8	100.0	28.4	12.8	58.8	100.0	1,669
30-34	70.0	21.9	8.1	100.0	13.7	9.0	77.3	100.0	1,410
35-39	72.6	20.2	7.3	100.0	15.9	8.9	75.3	100.0	954
40-44	78.2	17.9	3.9	100.0	10.1	8.5	85.5	100.0	836
45-49	84.9	12.3	2.8	100.0	6.6	5.9	87.6	100.0	624
REGION:									
Southeast	36.2	40.6	23.1	100.0	33.3	20.3	46.3	100.0	2,769
Southwest	26.1	29.8	44.1	100.0	55.9	11.1	33.0	100.0	1,915
Northwest	87.8	8.0	4.2	100.0	6.3	3.2	90.5	100.0	2,098
Northeast	83.7	11.8	4.5	100.0	6.3	7.6	86.1	100.0	1,999
RESIDENCE:									
Urban	31.2	26.7	42.1	100.0	53.6	12.6	33.8	100.0	2,187
Rural	65.8	23.0	11.2	100.0	16.3	10.9	72.7	100.0	6,594
RELIGION:									
Christ.	29.9	37.9	32.2	100.0	43.5	18.4	38.1	100.0	4,186
Islam	82.6	10.3	7.2	100.0	9.8	4.6	85.5	100.0	4,174
Others	77.0	19.7	3.3	100.0	4.8	7.1	88.1	100.0	415

NOTE: Educ -education; Christ.-christianity, Prim.-primary, Sec+ -secondary+ W/diff. -with difficulty, N/at all -not at all, * -totals for some characteristics are less than the total sample because of missing values.
SOURCE: NDHS, 1990 Raw data file.

The table also shows that the proportion of respondents with no education is much higher in the rural than in the urban areas. Rural respondents are more than twice as likely to have never attended school (65.8 percent) as urban respondents (31.2 percent).

The disparity that exists between the North and the South in terms of educational advancement is exhibited by the table. Over 80 percent of respondents from each of the two Northern regions have no formal education, compared to 26.1 and 36.2 percent in the

Southwest and Southeast regions respectively. The proportion of respondents with secondary and above education is highest for the Southwest (44.1 percent) and lowest for the Northwest (4.3 percent).

Minimal attendance at educational institutions, especially at primary school level, does not necessarily make an individual literate. On the other hand, a person that has never attended any formal school may by attending private classes or adult literacy lessons, be able to read and understand a particular language or languages. Table 3.9 shows that 63 percent of respondents could not read at all. While 25.6 percent could read easily, 11.3 percent could only read and understand with difficulty. The proportion of women who could not read and understand at all increases with age. Younger women are more literate than the older women as depicted by higher percentages of women at lower ages who could either read and understand easily or with difficulty. Just like in the case of educational attainment, the table shows a sharp contrast between the North and the South in terms of the level of literacy. While 33.3 and 55.9 percent of respondents in the Southeast and Southwest respectively could read easily, less than 10 percent in the Northern regions could do so. In each of the two Northern regions, over 86 percent of respondents are illiterates. Literacy level is higher in the urban (54 percent) than in the rural (16 percent) areas. Christians are more literate than muslims.

3.11 LABOUR FORCE PARTICIPATION

The labour force participation of women is a factor that has generally been known to affect fertility performance. This is because child rearing and employment compete for a woman's time and energy. The effect of labour force participation of women will depend on the extent to which women experience conflict between employment and raising a family. Table 3.10 presents the percentage distribution of respondents according to their occupation and place of work by some selected characteristics.

Table 3.10 Percentage distribution of respondents according to place of work and occupation by selected background characteristics.

CHARACTERISTICS	PLACE OF WORK:			TOTAL	OCCUPATION:			TOTAL	NO OF WOMEN*
	Not Wkg	Wkg at Home	Wkg Away	%	Agr/for. fishing	White collar	Sales & Services	%	
NIGERIA	39.1	21.1	39.9	100.0	39.2	8.4	52.2	100.0	8,712
REGION:									
Southeast	33.6	9.6	56.8	100.0	63.2	7.7	28.8	100.0	2,756
Southwest	30.2	17.3	52.6	100.0	20.5	17.7	61.4	100.0	1,902
Northwest	38.5	30.8	30.6	100.0	36.1	4.1	59.7	100.0	2,066
Northeast	55.7	30.4	13.9	100.0	22.1	2.1	75.5	100.0	1,989
RESIDENCE:									
Urban	38.0	22.4	39.6	100.0	7.1	18.1	74.3	100.0	2,174
Rural	39.4	20.6	40.0	100.0	50.1	5.1	44.7	100.0	6,538
EDUCATION:									
No Educ.	37.0	27.1	35.9	100.0	45.1	2.3	52.3	100.0	4,975
Primary	33.9	16.0	50.0	100.0	41.0	9.8	48.0	100.0	2,085
Secondary+	51.9	9.2	38.9	100.0	12.6	30.0	56.9	100.0	1,652

NOTE: Agr/for/fishing -agriculture, forestry and fishing, Wkg -working, Educ -education, * -totals for some characteristics are less than the total sample because of missing values.
SOURCE: NDHS, 1990 Raw data file.

About 39 percent of women in the country reported that they were not working at the time of the survey, while 60.9 percent reported that they were working. Of the number that claimed that they were working, 39.8 work away from home while 21.1 work at

home. The distribution of respondents according to place of work indicates almost a similar pattern in both rural and urban areas. In the regions, the percentage of women who reported not working is lowest in the Southwest (30.2 percent) and highest in the Northeast (55.7 percent). With regard to working at home, while only 9.6 percent of women in the Southeast work at home, 17.3, 30.8, and 30.4 percent work at home in the Southwest, Northwest and Northeast respectively. While most of the currently working respondents in the South work away from home, most of those from the North work at home. The proportion of women working away from home is highest in the Southeast (56.8 percent) and lowest in the Northeast (13.9 percent).

Differentials by educational attainment show a high percentage (51.9 percent) of women with secondary and above reporting not currently working. This may partly be because they are still pursuing their academic career. The table also shows that over one quarter (27.1 percent) of women with no education work at home compared to 16.0 and 9.2 percent respectively for primary and secondary and above categories. This is probably because employment at home is better suited for women with no education. Those with higher education are more likely to get public sector employment which is most likely to be away from home.

Table 3.10 also shows the percent distribution of currently working respondents according to their occupations. Majority of respondents (52.2 percent) are engaged in sales and services occupation. While about 40 percent are in agricultural-related

occupations, less than ten percent (8.4 percent) are employed in white collar jobs. While agricultural-related occupation predominates in the Southeast region (63.2 percent) majority of respondents in other regions are engaged in sales and services. As expected, given the level of education, respondents engaged in white collar jobs are highest in the Southwest region.

While majority (74.3 percent) of urban respondents are engaged in sales and services, half (50.1 percent) of rural respondents are engaged in agricultural-related occupations. As expected, compared to rural residents, a higher proportion of urban respondents are in white collar jobs. Similarly, almost one third of respondents with secondary and above education are employed in white collar jobs, compared to 2.3 and 9.8 percent observed for women with no education and primary education respectively.

3.12 HUSBAND'S CHARACTERISTICS: EDUCATION AND OCCUPATION

The husband's level of education and occupation is generally used as a proxy measure for the family's economic well-being, hence its importance in this study. Information on the level of education and occupation of the current or last husband was collected for all ever-married women. Table 3.11 presents the distribution of respondents according to their husband's educational attainment and occupation. The table shows that 57.2 percent of respondents have husband who have no education. While 24.6 percent of respondents have husbands with primary education, 18.2 percent have husbands with secondary and above education. Almost 60 percent of

respondents have husbands who are in agricultural-related occupations. While about a quarter (24.2 percent) have husbands who are in sales and services occupation, 10.5 percent have husbands who are involved in white collar occupations.

Table 3.11 Percentage distribution of respondents according to the their husband's education and occupation by selected characteristics.

CHARACT-ERISTICS	HUSBAND'S EDUCATION:			TOTAL	HUSBAND'S OCCUPATION:			TOTAL	NO OF
	No Educ.	Prim.	Sec+	%	Agric.	W/coll.	S & Ser.	%	WOMEN*
NIGERIA	57.2	46.6	18.1	100.0	59.6	14.9	24.2	100.0	7,217
REGION:									
Southeast	36.1	43.6	20.2	100.0	53.7	18.3	28.0	100.0	2,005
Southwest	22.6	36.5	40.9	100.0	33.0	36.4	30.6	100.0	1,364
Northwest	80.5	10.0	9.5	100.0	73.9	6.6	19.5	100.0	1,970
Northeast	80.4	11.0	8.5	100.0	72.8	5.6	21.7	100.0	1,878
RESIDENCE:									
Urban	30.3	31.2	38.5	100.0	13.6	37.7	48.7	100.0	1,559
Rural	64.6	22.8	12.6	100.0	73.0	9.0	18.0	100.0	5,658
EDUCATION:									
No Educ.	78.0	15.9	6.1	100.0	74.8	6.6	18.5	100.0	4,817
Primary	20.4	52.5	27.1	100.0	39.7	26.1	34.2	100.0	1,607
Sec+	5.7	21.0	73.3	100.0	12.2	45.7	42.1	100.0	793
OCCUPATION:									
Agric.	55.9	32.9	11.2	100.0	81.4	8.6	10.1	100.0	1,940
W/coll.	16.7	30.2	53.1	100.0	19.2	50.7	30.1	100.0	313
S & Ser.	52.8	25.7	21.5	100.0	44.0	19.2	36.8	100.0	2,607

NOTE:Agric.-Agriculture, forestry & fishing, Educ.-education, Prim.-primary
W/coll. -white collar, S & Ser. -sales & services, Sec+ -secondary+.
* -totals for some characteristics are less than the total sample because of missing values.
SOURCE: NDHS, 1990 Raw data file.

Almost three quarters of women in the North, rural areas and women with no formal education are married to men in agricultural related occupation. There is a general tendency for women to marry men in similarly occupations. This is particularly true for women in agricultural-related occupation (81.4 percent) and white collar jobs (50.7 percent).

3.13 ACCESS TO MASS MEDIA

The mass media can give women access to new ideas and information from the outside world. It can be used to entertain, enlighten and effect behavioural changes, convey information on topics ranging from health and nutrition to family planning. Table 3.12 presents the percentage distribution of respondents according to their access to mass media by selected background characteristics.

Table 3.12 Percentage distribution of respondents according to their Access to Mass Media by some selected background characteristics.

BACKGROUND CHARACTERISTICS	ACCESS TO MASS MEDIA:		TOTAL %	NO OF WOMEN*
	No Access	Have Access		
NIGERIA	44.9	55.1	100.0	8,780
AGE:				
15-24	40.8	59.2	100.0	3,287
25-34	43.9	56.1	100.0	3,079
35-49	51.8	48.2	100.0	2,414
EDUCATION:				
No Education	59.4	40.6	100.0	5,019
Primary	33.2	66.8	100.0	2,099
Secondary +	16.0	84.0	100.0	1,662
RESIDENCE:				
Urban	14.3	85.7	100.0	2,187
Rural	55.1	44.9	100.0	6,593
REGION:				
Southeast	43.9	56.1	100.0	2,768
Southwest	19.6	80.4	100.0	1,915
Northwest	55.5	48.5	100.0	2,098
Northeast	63.6	36.4	100.0	1,998

NOTE: * -totals for some characteristics are less than the total sample because of missing values.
SOURCE: NDHS, 1990 Raw data file.

In Nigeria, 44.9 percent of respondents had no access to mass media at all, that is, they do not listen to either radio or watch

TV at least once a week. About 55 percent of respondents have access, that is, they listen to radio or watch TV at least once a week.

Access to mass media is higher among younger women, urban residents, the more educated and residents of the Southwest region. About eighty percent of respondents in the Southwest have access to media (either listen to radio or watch TV at least once a week) compared to 56.1, 48.5 and 36.4 percent in the Southeast, Northwest and Northeast respectively. The case of Southwest region may partly be because the old Western Regional government whose area of jurisdiction covers more or less the present Southwest region first had its TV and radio station in Africa in 1960.

3.14 ENVIRONMENTAL CONDITIONS AND OWNERSHIP OF HOUSEHOLD FACILITIES

The ownership of some household facilities, sanitation facilities available and source of water supply can give an indication of the socioeconomic status of the household and the environmental conditions under which the respondents live. We are however considering source of drinking water, type of toilet facility available, availability of electricity and ownership of some household goods like radio, TV and refrigerator. Table 3.13 presents the distribution of respondents according to type of toilet facilities, source of drinking water and ownership of selected household facilities.

The table shows that pit latrines is the most common toilet facility (62.4 percent) in the country. More than a quarter of the

respondents have no toilet facilities in their homes. This pattern is also evident in the regions except in the Southwest where it is slightly below one quarter (21.8 percent). While almost 30 percent of respondents in the Southwest have flush systems, less than 10 percent of respondents in other regions have the facility. This is expected, considering the level of urbanization in the Southwest. Flush toilet is more common with urban residents and women with secondary and above education.

Table 3.13 Percentage distribution of respondents according to type of toilet facilities and source of drinking water and percentage owning some household facilities by selected characteristics.

CHARACT-ERISTICS	TOILET FACILITIES:				SOURCE OF DRINKING WATER:				HOUSEHOLD FACILITIES:				NO OF WOMEN
	Flush	Buckt	Pit	None	Pipe-b.	Well	River	Others	Electr	Radio	TV	Fridge	
NIGERIA	9.4	0.6	62.4	27.6	24.5	31.5	40.5	3.4	27.5	56.7	20.1	11.8	8,781
REGION:													
S/east	7.4	0.7	59.7	32.2	23.3	10.9	63.5	2.3	22.3	57.1	17.0	9.1	2,769
S/west	29.4	1.3	47.6	21.8	43.8	21.0	26.8	8.5	66.0	74.0	49.5	29.6	1,915
N/west	2.1	0.2	68.9	28.8	14.3	51.5	33.7	0.6	14.3	55.4	10.0	5.6	2,098
N/east	0.8	0.2	73.6	25.5	18.9	49.0	29.0	3.1	11.8	41.0	6.9	4.9	1,999
RESIDENCE:													
Urban	31.0	1.6	59.4	8.0	64.1	21.9	4.8	9.2	83.3	81.2	57.1	36.5	2,187
Rural	2.2	0.2	63.5	34.1	11.5	34.6	52.4	1.5	9.0	48.6	7.8	3.6	6,594
EDUCATION:													
No Educ.	1.8	0.4	65.3	32.5	14.2	41.7	42.0	2.1	11.9	45.9	7.2	3.6	5,020
Primary	9.4	0.5	62.7	27.4	28.0	19.9	48.1	4.0	33.9	64.9	26.1	13.4	2,099
Sec+	32.2	1.1	53.6	13.1	51.6	15.1	26.5	6.8	66.5	79.1	51.5	34.2	1,662

NOTE:S/east -southeast, S/west -southwest, N/west -northwest, N/east -northeast, Educ -education, Buckt -bucket, Pipe-b -pipe borne, Electr -electricity, River -rivers, springs, lakes etc, Sec+ -secondary+.
SOURCE: NDHS, 1990 Raw data file.

Rivers, springs and lakes are the most common source of drinking water in the country with over 40 percent of respondents getting their drinking water from such a source. Just about a quarter of respondents have access to pipe-borne water while more than one third get their drinking water from wells. Pipe-borne

water is a more common source of drinking water in the South, among urban residents and those with secondary and above education.

The table also shows that almost three quarters of respondents have no electricity in their homes. While almost 60 percent of respondents have radio in their homes, about 20 percent have TV sets. In all regions except Northeast, more than half of respondents have radio sets in their homes. Similarly, more than 80 percent of urban respondents have radio sets in their homes. About 11.8 percent of respondents have refrigerators. Ownership of radios, TV sets and refrigerators, are however higher for respondents from South, urban areas and those with secondary and above education.

3.15 SELECTED CHARACTERISTICS OF BIRTHS IN THE LAST FIVE YEARS

Table 3.14 presents the percentage distribution of births in the last five years according to their survival status, place of delivery and assistance at delivery by selected background characteristics of their mothers. The table shows that about 14 percent of births in the last five years were already dead before the interview. The proportions of births in the last five years that were already dead are slightly higher in the North than in the South, higher in the rural than in the urban areas, and negatively associated with the level of education of their mothers.

More than two thirds of births in the last five years were delivered at home. In the Northern regions, nine out of every ten births in the last five years were delivered at home. Births to

Southern mothers were more likely to be delivered at medical centres than births to their Northern counterparts. While home deliveries are more common with women with no formal education and rural residents, deliveries at medical centres are more common with women with secondary and above education and urban residents.

Table 3.14 Percentage distribution of births in the last five years according to their survival status, place of delivery and assistance at delivery by selected characteristics of their mothers.

SELECTED CHARACT-ERISTICS	SURVIVAL STATUS: Alive	Dead	Tot. %	ASSISTANCE AT DELIVERY: M/Pers.	TBA	Ot/None	Tot. %	PLACE OF DELIVERY: Home	M/cent.	O/pla.	Tot.%	NO OF CH/REN
NIGERIA	86.1	13.9	100.0	32.7	23.3	43.9	100.0	67.4	30.6	2.0	100.0	9,157
REGION:												
Southeast	89.1	10.9	100.0	49.4	28.1	22.5	100.0	50.8	46.0	3.2	100.0	2,719
Southwest	87.9	12.1	100.0	67.9	11.2	20.9	100.0	30.6	64.4	5.0	100.0	1,683
Northwest	82.3	17.7	100.0	10.3	23.8	65.9	100.0	90.1	9.6	0.3	100.0	2,568
Northeast	85.4	14.6	100.0	11.4	26.3	62.3	100.0	89.3	10.5	0.2	100.0	2,187
RESIDENCE:												
Urban	89.4	10.6	100.0	61.2	12.5	26.3	100.0	37.4	58.3	4.3	100.0	1,911
Rural	85.4	14.6	100.0	25.2	26.2	48.6	100.0	75.3	23.3	1.4	100.0	7,245
EDUCATION:												
No Educ.	84.5	15.5	100.0	17.2	25.9	56.9	100.0	83.4	15.7	0.9	100.0	5,828
Primary	87.7	12.3	100.0	51.0	23.0	25.9	100.0	48.7	47.4	3.8	100.0	2,269
Sec+	91.3	8.7	100.0	79.0	10.1	10.9	100.0	18.7	77.0	4.4	100.0	1,059

NOTE:Educ. -education, Tot.% -total percent, M/Pers.-medical personnel, Ot/None -others/no one, TBA -traditional birth attendants, M/cent. -medical centres, O/pla.-other places, Sec+ -secondary+.
SOURCE: NDHS, 1990 Raw data file.

About one third of births in the last five years were assisted at delivery by medical personnel. Births to urban women and the more educated were more likely to be assisted at delivery by medical personnel. Proportion of births assisted at delivery by medical personnel is positively associated with the level of education of their mothers.

CHAPTER IV

PATTERNS, PREVALENCE AND DURATION OF BREASTFEEDING

4.1 INTRODUCTION

Breastfeeding plays an influential role in child survival and birth spacing in most developing countries. Apart from being the best and safest way of feeding infants, it offers immunological protection to them against early morbidity and mortality. Breastfeeding is also capable of offering contraceptive protection to a mother against closely-spaced pregnancies. The effect is enhanced when the incidence of breastfeeding is high and the duration is prolonged. In other words, the mechanism through which the effect is accomplished depends on the incidence of breastfeeding, its duration, frequency of suckling and patterns of food supplementation (Rodriguez and Diaz, 1993; Huffman, 1984:170).

Socioeconomic and demographic factors are also known to influence breastfeeding practice. This section examines among other things the patterns of associations between these factors and breastfeeding practice: incidence, prevalence, frequency and duration and age at given food supplementation in the country.

4.2 INITIATION OF BREASTFEEDING

It is highly desirable that mothers should begin to breastfeed their babies as soon as possible after birth. Early initiation of breastfeeding will ensure the feeding of colostrum. Table 4.1 presents the percent distribution of last births ever breastfed according to how long after birth when they were first put to the

breast by selected background characteristics of their mothers.

Table 4.1 Percentage distribution of last births ever breastfed according to how long after birth they were put to the breast by selected background characteristics of their mothers.

SELECTED CHARACTERISTICS	TIME PUT TO THE BREAST:				
	IMMEDIA-TELY	WITHIN 1ST DAY	DAYS LATER	TOTAL %	NO OF BIRTHS*
NIGERIA	33.9	29.9	36.2	100.0	5,090
REGION:					
SouthEast	47.9	38.8	13.3	100.0	1,467
SouthWest	17.1	37.2	45.7	100.0	987
NorthWest	28.6	22.6	48.7	100.0	1,397
NorthEast	36.6	21.8	41.6	100.0	1,240
RESIDENCE:					
Urban	29.3	34.5	36.1	100.0	1,096
Rural	35.2	28.6	36.2	100.0	3,994
EDUCATION:					
No Education	34.7	24.7	40.6	100.0	3,252
Primary	34.5	37.3	28.2	100.0	1,226
Secondary+	28.8	42.5	28.7	100.0	613
SEX OF CHILD:					
Boy	33.8	29.8	36.4	100.0	2,543
Girl	34.0	29.9	36.0	100.0	2,547
SURVIVAL STATUS:					
Alive	34.5	30.1	35.5	100.0	4,735
Dead	26.4	27.7	45.9	100.0	355
ASSISTANCE AT DELIVERY:					
Medical Personnel	30.0	41.8	28.3	100.0	1,619
TBA	35.5	22.1	42.4	100.0	1,182
Others or No one	35.8	25.6	38.6	100.0	2,285
PLACE OF DELIVERY:					
Home	36.2	24.0	39.8	100.0	3,454
Medical centres	29.2	42.6	28.2	100.0	1,510
Other places	27.6	38.7	33.7	100.0	126

NOTE:* Totals for some of the characteristics are less than the total sample because of missing values.
Source: NDHS, 1990 Raw data file.

Table 4.1 shows that about one third (33.9 percent) of last births ever breastfed were put to breast immediately after delivery in the country, while about 29.9 percent were put to breast within the first day and 36.2 percent were put to breast days later.

Regional differential in first breastfeeding practice indicates that almost half (47.9 percent) of births in the Southeast were put to breast immediately after delivery compared to as low as 17.1 percent in the Southwest Region. The table also shows that over forty percent of births in the Southwest, Northwest and Northeast were put to breast days after delivery. This may be due to adherence to breastfeeding taboos. Women have been known to delay initiation of breastfeeding in many societies because they believe that colostrum is dirty and poisonous to the baby (Ezumezu, 1993). They deliberately delay nursing for longer periods and feed the new born infants with other liquids or food until the colostrum is completely drained. Almost 40 percent of last births in the Southwest and Southeast were put to the breast within the first day compared to about 20 percent in the Northwest and Northeast. Considering the comparatively high proportion of births delivered at medical centres in the Southern regions, this finding is possibly due to routine separation of newborns from their mothers immediately after delivery in hospitals or other health facilities.

Urban-rural differential in the first breastfeeding practice shows that rural births have a higher chance of being put to the breast immediately after birth than their counterparts in the urban areas. This, as earlier explained, may be due to routine practice of separating newborns from their mothers which may have affected more urban than rural births. Equal proportions of births (about 36 percent) in both the rural and urban areas were put to the breast days later.

Initiation of breastfeeding appears not to be influenced by the sex of the child. However, with respect to the survival status of the child, a very high proportion (45.9 percent) of dead children were put to the breast days later. This rather high proportion may also be suggestive of the increased morbidity and mortality risks to which infants put to breast days later are being exposed.

With respect to educational attainment, births to mothers with no education or primary education (about 34 percent) have a higher chance of being put to breast immediately after birth than those born to mothers with secondary and above education (28.8 percent).

Initiation of breastfeeding with respect to use of health care facilities (place of delivery and assistance at delivery) shows that hospital/medical facility deliveries have lower chance of being put to breast immediately after birth than home deliveries or deliveries in other places. This, as earlier mentioned, may be because women who deliver in health facilities have to contend with hospital routines, one of which is the practice of keeping the new baby in the nursery for some time. The person who assists a woman at delivery is a function of the place of delivery. It is therefore not surprising that births assisted at delivery by health personnel are less likely to be put to breast immediately after delivery than their counterparts assisted at delivery by traditional birth attendants. We have earlier established that more than three quarters of births to women with secondary and above education were delivered at health centres and almost 80 percent of births to them

were assisted at delivery by medical personnel. Subjection to hospital routines may in part explain why births to women with secondary and above education have a lower probability of being put to breast immediately compared to women with no education but a higher probability of being put to breast within the first day.

The timing of breastfeeding initiation determines whether or not an infant is fed colostrum. This is because the breasts secrete colostrum within the first few days after delivery. Consequently, those who put their babies to breast immediately or within the first day of delivery, have a higher chance of feeding colostrum compared to those who put their babies to breast days later. Colostrum which is yellow and thicker than later milk, is rich in antibodies, white blood cells and growth factors in addition to being a laxative (King, 1992:26). Women who ever breastfed their last child were asked whether or not they fed colostrum from the breast or waited until colostrum passed. Table 4.2 presents the percentage of women who ever breastfed their last born who fed colostrum according to selected characteristics.

In Nigeria, almost 60 percent of women who ever breastfed their last child fed colostrum. Colostrum feeding is highest in the Southeast (85.3 percent) and lowest in the Northwest (40.7 percent). In general, higher proportions of mothers fed colostrum in the South than in the North and more prevalent in the urban than in rural areas. This may likely be because of the waning influence of existing taboos on colostrum feeding owing to the influence of education and modernization in the South and urban areas.

Table 4.2 Percentage of women who ever breastfed their last child, born five years before the survey, who fed colostrum according to age of mother at birth and selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:				NO OF
	<25	25-34	35+	All ages	WOMEN*
NIGERIA	54.1	62.2	55.7	57.9	5,098
REGION:					
Southeast	85.3	87.1	81.2	85.3	1,466
Southwest	54.1	62.5	51.3	57.6	984
Northwest	37.1	45.7	36.0	40.7	1,407
Northeast	46.3	44.7	44.6	45.5	1,242
PLACE OF RESIDENCE:					
Urban	57.6	66.6	61.2	62.6	1,093
Rural	53.2	60.8	54.5	56.7	4,005
SEX OF CHILD:					
Boy	56.1	63.2	53.7	58.9	2,543
Girl	51.9	61.1	57.4	57.0	2,555
SURVIVAL STATUS:					
Alive	55.0	62.8	56.8	58.8	4,743
Dead	44.4	52.8	40.9	46.9	355
EDUCATION:					
No Education	43.5	56.3	52.3	51.1	3,262
Primary	67.0	72.2	71.7	69.9	1,225
Secondary+	69.3	73.7	59.8	70.8	611
LITERACY:					
Easily	70.6	74.2	69.2	72.1	944
With Difficulty	66.7	75.5	62.5	70.0	558
Not at all	45.9	57.0	53.5	52.3	3,595
PLACE OF DELIVERY:					
Home	48.9	54.7	53.7	52.1	3,465
Medical centres	67.4	75.8	61.0	70.5	1,508
Other places	73.9	71.6	(45.0)	68.1	125
ASSISTANCE AT DELIVERY:					
Medical Pers.	67.3	76.3	60.9	70.7	1,616
TBA	49.4	52.7	55.4	51.7	1,182
Others/No one	49.2	55.1	52.1	52.3	2,296

NOTE: Pers. -personnel,
* Totals for some of the characteristics do not add to the total sample because of missing values.
Source:NDHS, 1990 Raw data file.

Colostrum feeding practice is observed to be positively associated with the level of education and literacy. This is also generally observed to be true for all age groups of mothers. This is expected since educated or literate women are less likely to still hold fast to taboos on colostrum feeding practice than their counterparts with no education, less education or illiterates.

There appears to be a slight sex preference in colostrum feeding in favour of males. Feeding of colostrum and survival status of the child at the time of interview indicate that lower proportions of dead children were fed colostrum. This is quite logical as some of the children who died may have been too ill to suckle immediately after delivery. The mother may also be too ill to breastfeed the child immediately. This may in part be the reason why their survival chances were also impaired.

Colostrum feeding according to age of mother at birth indicates a positive association with respect to the first two age groups and a lower percentage in the last age group in the total sample. The age pattern of colostrum feeding with respect to other background characteristics appears not to be consistent.

Colostrum feeding practice is more prevalent with women who use modern health care facilities. Higher proportions of women who delivered at medical centres fed colostrum compared to those who delivered at home or other places. Similarly, higher proportions of women whose delivery were assisted by health professionals fed colostrum compared to those who were assisted at delivery by traditional birth attendants (TBAs). These health professionals,

who are more likely to know the importance of colostrum feeding, may have aided or encouraged many of the mothers to feed colostrum in conformity with the hospital practice. The fact that some mothers who delivered in medical centres or were assisted at delivery by medical personnel did not feed colostrum may either be due to their refusal to do so in line with the beliefs they held or that the child was to ill to suckle or that the mother was too ill to breastfeed.

While some mothers fed colostrum, others waited for colostrum to pass before initiating breastfeeding. Mothers who waited for colostrum to pass were asked what they fed their babies with while they waited. Table 4.3 presents information on types of liquids the children were fed with while mothers waited for the colostrum to pass.

The table shows that majority of mothers (61.6 percent) fed their babies with plain water. While 16.1 percent were fed on sugar/glucose water, 3.4, 17.5 and 1.4 percent were fed on baby formula, fresh milk and other liquids respectively. While about two thirds of births not fed colostrum in the Southeast, Northwest, and Northeast were fed on plain water, about the same proportion (64.5 percent) from the Southwest were fed with sugar/glucose water. Though using baby formula as a pre-lacteal feed is generally observed to be low in the country, it is higher in the South than in the North. Feeding on fresh milk is, however, more common in the North. While feeding on plain water is observed to be associated with births to rural residents, less educated, and births delivered

at home, feeding on sugar/glucose water and infant formula is associated with births to urban residents, the more educated, and to births delivered at medical centres or assisted at delivery by health professionals.

Table 4.3 Percentage distribution of ever breastfed last births, not fed colostrum and according to what was fed while waiting for colostrum to pass by selected characteristics.

SELECTED CHARACTER-ISTICS	WHAT WAS FED WHILE WAITING:						
	Plain water	Sug/Glu. water	Baby formula	Fresh milk	Other things	TOTAL %	NO OF BIRTHS*
NIGERIA	61.6	16.1	3.4	17.5	1.4	100.0	2,130
REGION:							
Southeast	68.3	19.5	9.0	0.5	2.7	100.0	210
Southwest	28.9	64.5	5.4	0.1	1.1	100.0	416
Northwest	72.9	2.9	1.5	21.5	1.2	100.0	826
Northeast	65.9	1.5	2.7	28.5	1.5	100.0	677
RESIDENCE:							
Urban	42.7	44.5	7.4	4.7	0.7	100.0	405
Rural	66.1	9.4	2.5	20.5	1.6	100.0	1,724
EDUCATION:							
No Education	65.1	8.9	2.6	22.2	1.2	100.0	1,591
Primary	57.5	30.4	5.3	4.9	2.0	100.0	363
Secondary+	38.9	51.7	6.8	0.6	2.0	100.0	175
ASSISTANCE AT DELIVERY:							
Medical Pers.	45.9	46.0	6.5	1.0	0.6	100.0	455
TBA	47.5	10.7	3.4	36.4	2.0	100.0	484
Others/No one	74.3	6.9	2.2	16.0	1.5	100.0	1,189
PLACE OF DELIVERY:							
Home	66.9	7.4	2.2	22.3	1.3	100.0	1,648
Medical centre	45.3	44.6	7.4	1.0	1.6	100.0	442
Other places	(24.0)	(61.9)	(10.1)	(0.0)	(3.9)	100.0	39

NOTE: Pers.-personnel, SUG/GLU.-sugar/glucose, ( )-less than 10 cases
* Totals for some of the characteristics are less than the total sample because of missing values.
Source: NDHS, 1990 Raw data file.

Feeding on fresh milk is observed to be more prevalent amongst rural residents, or those with no education. Items fed are most likely to be a function of what is readily available in each area. In the North, for example, where there are more Fulani or cattle rearers, feeding on fresh milk is prevalent. In the urban areas

sugar, glucose, and baby formula are likely to be more readily available and this may partly account for the higher incidence of usage as pre-lacteal feed among urban residents and the more educated.

4.3 PREVALENCE OF BREASTFEEDING

Although breastfeeding of infants is an almost universal characteristic of human society, some women do not wish to or are unable to breastfeed their children. The child may be ill or weak to suckle, or the mother may be ill at the time of delivery or soon after. There may also be nipple or breast problems. The proportion of children never breastfed is a manifestation of the importance of breastfeeding in a population. Table 4.4 presents the percentage of children born in the last five years who were never breastfed according to birth order and selected background characteristics of their mothers.

At the national level and for most of the selected background characteristics, an overwhelming proportion of the three most recent children born to each woman in the last five years were breastfed. Only 2.6 percent of all children born in the five years preceding the survey were never breastfed. This finding is very much in agreement with Trussell's analysis of 47 DHS surveys which found that the proportion of children ever breastfed in most African countries was above 95 percent. The analysis which also covered Ondo state, Nigeria DHS reported that 97.9 percent of

births in the last five years were breastfed (Trussell *et al.*,1992:296-297).

Table 4.4 Percentage of children born in the last five years who were never breastfed according to birth order and some selected characteristics of mother.

SELECTED CHARACTERISTICS	BIRTH ORDER: Last	Next-to-last	Second-to-last	All births	Births last 12 mths	TOTAL BIRTHS*
NIGERIA	1.9	3.5	2.8	2.6	2.4	9,157
REGION:						
Southeast	2.0	1.9	0.1	2.0	1.3	2,719
Southwest	2.3	4.1	2.0	2.8	4.2	1,683
Northwest	1.8	4.1	3.3	2.9	1.9	2,568
Northeast	1.5	4.3	7.2	2.8	2.7	2,187
RESIDENCE:						
Urban	1.6	4.2	2.6	2.6	2.8	1,911
Rural	2.0	3.3	2.9	2.6	2.3	7,245
EDUCATION:						
No Education	1.6	3.8	3.3	2.5	1.8	5,828
Primary	2.7	3.1	1.6	2.7	3.0	2,269
Secondary+	1.9	2.1	3.4	2.6	3.6	1,059
AGE OF MOTHER AT BIRTH:						
15-24	2.2	3.8	3.0	3.0	2.5	3,828
25-34	1.2	2.5	2.8	1.9	2.1	3,913
35+	2.9	6.0	2.0	3.6	2.9	1,276
SEX OF CHILD:						
Boy	2.1	4.2	2.9	3.0	2.9	4,562
Girl	1.7	2.8	2.7	2.2	1.9	4,595
SURVIVAL STATUS:						
Alive	0.6	0.8	1.4	0.7	0.6	7,795
Dead	16.9	15.0	6.7	14.6	25.2	1,224
PLACE OF DELIVERY:						
Home	1.5	2.9	3.3	2.2	1.8	6,071
Medical Centres	2.9	4.9	1.9	3.6	4.0	2,765
Other Places	1.1		(11.7)	1.2		182
ASSISTANCE AT DELIVERY:						
Medical Personnel	2.8	4.6	1.9	3.5	3.7	2,959
TBA	1.9	2.8	3.9	2.4	1.8	2,110
Others or No one	1.3	3.0	3.0	2.0	1.7	3,969

NOTE: * Totals for some of the characteristics are less than the total sample because of missing values,
Source:NDHS, 1990 Raw data file.

When birth order is considered, the proportion of children not breastfed is still found to be low and in most cases below 4 percent. With the selected characteristics, the table further

confirms the universality of breastfeeding behaviour in the country. However, proportion of children not breastfed is slightly higher for male than female children for all birth orders. This may be a manifestation of differential impact of infant mortality which may have been higher for the males than females. A child that died not long after delivery may have little chance of being breastfed. Even where the child who died early was ever breastfed, the mother may not be psychologically disposed to report on the child during interview, thus resulting in the child being coded as missing. This may have affected the computed proportions.

The proportion not breastfed is also observed to be higher for dead than for living children. This is expected, as it is most likely that many of them might have died soon after delivery thereby making breastfeeding impossible. The same explanation earlier given with respect to the psychological disposition of mothers to report on dead children may also apply. Even when analysis is restricted to births in the last 12 months, the percentage never breastfed still remained low.

4.4 BREASTFEEDING IN THE OPEN INTERVAL

Breastfeeding status in the open interval gives a snapshot of the breastfeeding situation in the country. Table 4.5 presents the percentage distribution of all women with surviving last birth by their breastfeeding status at the time of the survey and some selected background characteristics. As at the time of the survey, 42 percent of women with surviving last births, born in the five

years before the survey had stopped breastfeeding. About 58 percent of women still breastfeeding are made up of 46.6 percent breastfeeding with supplements (milk, solid/mushy foods etc), 10.9 percent breastfeeding with plain water and 0.5 percent exclusively breastfeeding.

Table 4.5 Percentage distribution of all women with surviving last birth according to their breastfeeding status at the time of survey by selected background characteristics.

SELECTED CHARACTERISTICS	BREASTFEEDING STATUS:				TOTAL %	NO OF* CH/DREN
	Not b/f	Excl. b/f	B/f with pl/water	B/f with supplements		
NIGERIA	42.0	0.5	10.9	46.6	100.0	4,745
REGION:						
Southeast	46.5	0.4	8.5	44.5	100.0	1,386
Southwest	52.6	0.2	5.2	42.0	100.0	928
Northwest	33.9	0.5	14.3	51.4	100.0	1,279
Northeast	37.2	0.8	14.5	47.4	100.0	1,152
RESIDENCE:						
Urban	53.4	0.5	6.4	39.7	100.0	1,029
Rural	38.9	0.5	12.1	48.5	100.0	3,716
EDUCATION:						
No Education	40.1	0.4	12.2	47.2	100.0	3,013
Primary	42.7	0.9	10.5	46.0	100.0	1,152
Secondary+	50.7	-	4.7	44.6	100.0	581
PLACE OF WORK:						
Not Working	36.8	6.8	16.0	46.4	100.0	1,514
Working at Home	44.1	0.2	10.3	45.4	100.0	1,114
Working away	44.4	0.4	7.4	47.7	100.0	2,074

NOTE: CH/DREN -children, B/f -breastfeeding, Exclu.-exclusively, pl/water -plain water, * Totals for some of the characteristics are less than the total sample because of missing values,
Source:NDHS, 1990 Raw data file.

Higher proportions of women in the Northern regions were either breastfeeding with plain water or exclusively breastfeeding or breastfeeding with supplements compared with their counterparts in the Southern regions. In the Southern regions about half of women

were no longer breastfeeding compared with less than 40 percent in the North.

A higher proportion of women in the rural area with surviving last births were either still breastfeeding with plain water or breastfeeding with supplements compared to women in urban area. While educational level appears to be positively associated with proportions no longer breastfeeding, it is negatively associated with proportion either breastfeeding with plain water or breastfeeding with supplements. With respect to women's place of work, the table shows as expected, that a higher proportions of women who work away from home are breastfeeding with supplements compared to their counterparts not working or working at home. This is suggestive of higher conflict, experienced by women working away from home, between work and breastfeeding. They consequently resort to supplementation.

One way to measure the extent of breastfeeding is by finding the percentage of women still breastfeeding their last child at the time of the survey. Though this measure is crude, it indicates very quickly and in overall terms how many women are currently involved in breastfeeding (Tawiah, 1994:235). This analysis is limited only to women who have had at least a child in the last five years. Table 4.6 shows the percentage of women still breastfeeding their last children according to age of mother at birth and selected characteristics.

Almost sixty percent (57.9 percent) of women were still breastfeeding their last child as at the time of interview.

Table 4.6 Percentage of women still breastfeeding their last child at the time of interview by age of mother at birth and some selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:				NO OF
	<25	25-34	35+	All ages	WOMEN*
NIGERIA	59.8	57.4	54.4	57.9	4,745
REGION:					
Southeast	59.2	52.8	44.9	53.4	1,386
Southwest	51.7	45.6	45.2	47.4	928
Northwest	63.4	66.2	74.1	66.1	1,279
Northeast	61.0	66.8	58.5	62.8	1,152
RESIDENCE:					
Urban	45.6	49.1	40.2	46.6	1,029
Rural	63.4	60.4	57.6	61.1	3,716
EDUCATION:					
No Education	60.1	60.9	57.2	59.8	3,013
Primary	64.0	54.5	43.3	57.3	1,152
Secondary+	52.3	46.8	34.0	49.3	581
PLACE OF DELIVERY:					
Home	61.9	63.3	61.1	62.3	3,188
Medical centres	52.8	48.1	40.0	48.3	1,436
Other places	73.4	45.8	48.1	55.8	121
ASSISTANCE AT DELIVERY:					
Medical Pers.	54.5	48.4	40.4	49.0	1,546
TBA	56.9	62.9	48.7	58.1	1,061
Others/No one	64.3	63.0	66.9	64.3	2,133
RELIGION:					
Christianity	57.5	51.4	50.3	53.3	2,060
Islam	61.2	64.0	59.8	62.2	2,434
Others	59.6	54.7	49.9	54.7	249
CHILDHOOD RESIDENCE:					
Urban	50.9	51.1	47.5	50.5	1,263
Rural	63.0	60.1	56.5	60.6	3,472
PLACE OF WORK:					
Not Working	63.1	63.7	61.7	63.2	1,514
Working at home	54.3	60.2	46.6	55.9	1,114
Working Away	59.1	53.8	53.9	55.5	2,074
WOMEN'S OCCUPATION:					
Agric/For/Fish.	63.6	54.9	52.7	57.3	1,290
White Collar	61.1	36.5	30.0	43.5	213
Sales & Services	52.1	58.2	53.9	55.5	1,721

NOTE: Pers.-personnel, Agric/For/Fish -Agriculture, Forestry and Fishing, * Totals for some of the characteristics are less than the total sample because of missing cases,
Source: NDHS, 1990 Raw data file.

The proportion of women still breastfeeding their last child is generally observed to decline with the age of mother at birth. Further investigation (not shown) however, revealed that distribution of surviving last births born five years preceding the survey by age of mother at birth indicates that births to older women were comparatively older, and therefore more likely to have been weaned at the time of the survey.

The proportion of women still breastfeeding ranges between 47.4 percent in the Southwest and 66.1 percent in the Northeast and is higher in the rural than in urban areas. This finding appears to give support to the observations already made that life-styles in urban areas are either somehow incompatible with breastfeeding or a subconscious attempt to move from traditional to modern culture (Raphael, 1979; Jelliffe and Jelliffe, 1978). Urban women are more likely to be well educated, employed in modern sector jobs and relatively isolated from extended family. On the other hand, in the rural areas, there are usually extended family members like in-laws, parents and other adult members living with the lactating mother. They can influence a woman's breastfeeding practice. Rural lactating mothers are also more likely to be exposed to other women breastfeeding openly in the community and can learn by observation the essential techniques of the practice. All these are more likely to be absent in urban areas. The above finding may also be suggestive of the influence that social support has on breastfeeding practice.

The proportions of women still breastfeeding generally declines with increased educational attainment of women. With respect to childhood place of residence, a higher proportion of women with rural childhood place of residence were still breastfeeding their last child at the time of the interview compared to those with urban childhood place.

Breastfeeding behaviour of women and place of work depict that higher proportion of women not currently working (at home or away), compared with their counterparts currently working, were still breastfeeding their last child as at the time of the interview. This is likely because women not currently working have more conducive conditions for breastfeeding their last child. They have more time for the child in addition to relative ease for both mother and child to be together for most of the time. These conditions are more likely to be absent for mothers currently working. On the other hand, a mother that is currently working may be economically capable and can readily afford breastmilk substitutes that the child can feed on while the mother is at work.

While information provided by any breastfeeding may give an overview of the general breastfeeding situation in the country or part of it, it is not detailed enough for policy and planning purposes. Nutritionists have generally recommended that infants should be exclusively breastfed until they are 4 to 6 months of age (Sharma and Rutstein, 1991:406).

In addition to exclusive breastfeeding, full breastfeeding also includes situations whereby water is given to the child in

addition to breastmilk. Table 4.7 presents the percentage of women who were still fully breastfeeding their last child at the time of interview according to age of mother at birth and some selected background characteristics. The table shows that about 11 percent of all women with surviving last births were still fully breastfeeding them at the time of the interview. The proportion of women still fully breastfeeding their last child according to age of mother at birth shows a positive association with the first two age groups and a decline in the last age group. The earlier mentioned explanation on the age distribution of last births for the different age groups of mothers may in part be responsible for this result. For selected characteristics, the proportion of women still fully breastfeeding according to age of mother at birth appears not to be consistent.

The percentage still fully breastfeeding is observed to be lowest in the Southwest (5.4 percent) and highest in the Northeast (15.4 percent). For all age groups of women the percentages still fully breastfeeding are higher in the rural than urban areas. Full breastfeeding practice is negatively associated with level of education. A much lower proportion of women currently working away from home were fully breastfeeding their last child at the time of interview compared to those not working or those working at home. This is expected since full breastfeeding is easier when the mother and child are together. As earlier explained, a woman who is currently working is more likely to find it difficult if not

impossible to have the child around her for most of the time to be able to practise full breastfeeding.

Table 4.7 Percentage of women still fully breastfeeding their last child at the time of interview by age of mother at birth and selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:				NO OF
	<25	25-34	35+	All ages	WOMEN*
NIGERIA	10.7	12.7	9.4	11.4	4,745
REGION:					
Southeast	9.2	9.9	5.9	8.9	1,386
Southwest	2.6	7.6	4.1	5.4	878
Northwest	12.3	17.4	13.7	14.8	1,090
Northeast	14.4	16.4	15.8	15.4	975
RESIDENCE:					
Urban	5.1	8.4	5.9	6.9	1,029
Rural	12.1	14.1	10.1	12.6	3,716
EDUCATION:					
No Education	12.4	14.0	10.3	12.7	3,013
Primary	11.0	12.9	6.2	11.4	1,152
Secondary+	4.4	(5.3)	-	4.7	581
RELIGION:					
Christianity	7.9	9.7	7.2	8.6	2,060
Islam	12.7	15.7	11.1	13.7	2,434
Others	(6.6)	12.9	(13.1)	11.4	249
PLACE OF WORK:					
Not Working	14.6	19.5	18.3	16.8	1,514
Working at home	6.9	13.6	8.8	10.5	1,114
Working away	8.2	8.8	5.1	7.9	2,074
WOMEN'S OCCUPATION:					
Agric/For/Fish.	8.1	11.5	5.7	9.0	1,290
White Collar	(4.7)	(5.5)	(5.7)	5.3	213
Sales & Services	7.8	10.3	7.6	9.0	1,721
PLACE OF DELIVERY:					
Home	12.1	15.3	10.9	13.3	3,188
Medical centres	6.5	8.3	6.2	7.4	1,436
Other places	(12.2)	(7.3)	(6.9)	8.9	121
ASSISTANCE AT DELIVERY:					
Medical Personnel	7.1	8.5	6.2	7.7	1,546
TBA	9.4	17.7	10.1	12.9	1,061
Others or No one	13.3	13.9	11.3	13.2	2,133

NOTE: Agric/For/Fish -Agriculture, Forestry and Fishing,
* Totals for some of the characteristics are less than the total sample because of missing values, ( ) -less than 10 cases
Source: NDHS, 1990 Raw data file.

Women who delivered their babies at home or were assisted at delivery by TBA are more likely to be fully breastfeeding compared to those who delivered their babies in medical centres or were assisted at delivery by medical personnel. This may be due to lack of influences of modern health care services like influences of health professionals, promotional activities of infant formula industries in hospitals which may not be very supportive to full breastfeeding.

Higher proportions of Muslims are still fully breastfeeding their babies compared to their Christian counterparts. Women employed in white collar jobs are less likely to fully breastfeed compared to their counterparts in agriculture-related and sales and services occupations. Those in agricultural-related occupations and those in sales and services have the same percentage still fully breastfeeding their last child at the time of interview.

4.5 BREASTFEEDING AT SELECTED AGES AFTER BIRTH

Information on the proportion of all surviving children who are still being breastfed at selected ages after birth gives an overall pattern of breastfeeding in a country. Table 4.8 presents the percentage of children born less than 36 months before the survey who are still being breastfed at selected ages after birth by selected background characteristics of their mothers.

The table shows that the country exhibits a traditional pattern of breastfeeding where on the average about 99.6 percent of all children were being breastfed at 3 months of age with the

percentage virtually remaining unchanged at six months. The percentage drops only slightly to about 89.2 percent at 12 months. Even at 18 months over 60 percent were still being breastfed while at 24 months slightly less than 30 percent of the children were still being breastfed (Sharma and Rutstein, 1991:405).

Table 4.8 Percentage of surviving children born 36 months preceding the interview who were still being breastfed at selected ages after birth by selected background characteristics of their mothers.

CHARACTER-ISTICS	SELECTED AGES AFTER BIRTH (MONTHS)							ALL
	3	6	12	18	24	30	36	(0-36)
NIGERIA	99.6	98.8	89.2	62.1	28.5	6.0	2.7	70.2
REGION:								
Southeast	98.4	100.0	91.7	58.0	35.4	15.4	8.7	67.2
Southwest	100.0	95.8	83.4	54.7	9.9	-	-	59.7
Northwest	100.0	100.0	86.7	45.4	30.8	5.2	-	77.7
Northeast	100.0	98.4	95.4	89.2	30.3	4.7	-	74.0
RESIDENCE:								
Urban	100.0	96.6	83.4	27.1	12.8	-	-	59.2
Rural	99.5	99.4	91.1	71.3	32.0	7.7	3.8	73.2
EDUCATION:								
No Education	99.4	99.2	89.8	73.2	35.3	5.8	4.0	73.3
Primary	100.0	99.1	94.4	63.5	12.4	3.8	-	68.8
Secondary+	100.0	96.3	68.5	26.5	23.5	20.9	-	58.3
PLACE OF DELIVERY:								
Home	99.4	100.0	91.7	71.5	38.2	5.7	-	74.7
Medical cent.	100.0	96.0	80.2	32.4	3.5	7.1	7.8	60.5
ASSISTANCE AT DELIVERY:								
Medical Pers.	100.0	96.7	82.5	35.2	3.4	7.1	7.4	61.5
TBA	100.0	100.0	91.4	66.3	41.5	3.3	-	69.0
Others/No one	99.3	100.0	91.7	77.2	37.0	6.6	-	77.3
HUSBAND'S OCCUPATION:								
Agr/For/fish.	99.4	99.2	93.7	74.3	37.9	8.6	-	74.0
White collar	100.0	95.8	77.3	18.9	8.7	8.0	-	66.4
Sales & Serv.	100.0	99.2	85.5	48.0	16.7	-	-	64.6

Note: Pers.-personnel, Cent.-centres, Serv.-services, Agr/For/fish.-agric, forestry and fishing,
Source: NDHS, 1990 Raw data file.

With respect to most of the background characteristics of their mothers, there are not much variations in percentage still being breastfed in the first six months. There is a general tendency by Southwest mothers to stop breastfeeding earlier. This

is shown by the proportion still being breastfed at selected ages after birth observed to decline more steeply in the Southwest than in the other regions. Similarly, for urban residents the percentage still being breastfed declines steeply after 12 months. It drops to about 83.4 percent at 12 months and to 56.2 percent at 15 months. At eighteen months, about 27.1 percent of children were still being breastfed compared to 71.3 percent observed for rural residents.

While 32 percent of children born to rural residents and aged 24 months were still being breastfed, only 12.8 percent of those born to urban residents were doing so. Steeper decline in percent still being breastfed at selected ages after birth is observed for children born to women with secondary and above education, children delivered at medical centres or assisted at delivery by medical personnel. Steeper declines are also observed for children born to women whose husbands are in white collar occupation. In contrast, a more gradual decline of proportion still being breastfed at selected ages is observed for children born to women with no education, children delivered at home or assisted at delivery by traditional birth attendants, and those born to women whose husbands are either in sales and services or agricultural-related occupations.

Table 4.9 also presents the percentage of women still fully breastfeeding their last child at selected ages after birth by selected background characteristics. In the country, about 24 percent of women whose last births are aged between 0 and 15 months were still fully breastfed at the time of interview. At age 0

months 76.4 percent were being fully breastfeeding. The percentage drops to less than 50 percent at age 2 months and to 25 percent at 6 months. By 12 months less than 6 percent were still fully breastfeeding.

Table 4.9 Percentage of women who were fully breastfeeding at selected ages of child by selected background characteristics.

CHARACTERISTICS	SELECTED AGES OF CHILD (MONTHS):							ALL
	0	2	4	6	9	12	15	(0-15)
NIGERIA	76.4	48.3	31.7	25.0	7.8	5.5	2.1	24.0
REGION:								
Southeast	81.7	47.0	12.5	12.5	-	-	0.3	19.8
Southwest	76.9	6.9	-	2.3	6.0	2.8	12.3	12.0
Northwest	74.1	69.9	61.0	37.5	13.0	8.8	-	28.6
Northeast	72.8	60.1	45.0	42.2	9.8	6.7	1.8	33.6
RESIDENCE:								
Urban	75.9	35.2	16.0	16.6	11.0	2.0	-	15.7
Rural	76.6	51.4	36.0	27.3	7.1	6.6	2.6	26.2
EDUCATION:								
No Education	74.4	53.4	42.7	34.9	11.3	6.2	2.3	27.9
Primary	96.5	49.7	22.8	14.4	2.6	5.6	-	23.2
Secondary+	41.6	25.8	7.0	-	-	-	3.5	9.1
PLACE OF WORK:								
Not Working	75.2	57.5	40.0	37.2	11.3	9.8	1.5	32.1
Working at Home	82.4	46.4	47.2	17.1	13.7	5.6	6.1	21.6
Working Away	73.4	34.5	14.0	16.3	2.2	1.0	-	18.2
PLACE OF DELIVERY:								
Home	78.1	56.0	43.6	30.1	9.4	4.5	2.9	27.6
Medical centres	74.1	33.4	7.9	11.8	1.8	8.5	-	16.5
ASSISTANCE AT DELIVERY:								
Medical Pers.	76.1	37.1	9.4	9.7	1.8	7.5	-	16.9
TBA	73.1	53.1	40.9	33.2	4.9	1.0	-	26.8
Others/No one	81.7	52.4	45.5	33.6	11.9	7.2	4.7	27.7
LITERACY:								
Easily	78.4	33.9	10.1	2.9	-	1.1	2.9	13.9
With Difficulty	55.5	46.4	44.2	-	8.0	-	-	25.1
Not at all	78.0	55.3	35.9	34.9	10.2	7.2	2.2	27.0

Note: Pers.-personnel,
Source: NDHS, 1990 Raw data file.

For the regions, table 4.9 reveals a general tendency by Southern mothers to terminate breastfeeding earlier than their Northern counterparts with the percentage of women still fully breastfeeding at the time of interview declining more steeply in

the South than in the North. In the South, the decline is even steeper for Southwest women where full breastfeeding virtually ends before children are two months of age. The percentage of women still breastfeeding in the Southwest region at age 15 months (12.3) appears abnormal and needs to be interpreted with a lot of caution as it is based on less than five observations.

The proportion of women still fully breastfeeding declines more steeply in the urban than in the rural areas indicating the general tendency for women in urban areas to terminate breastfeeding early as compared to rural women. This may be due to the fact that the life-styles of urban mothers may have made full breastfeeding more difficult. As indicated earlier on, social support for full breastfeeding may also be absent in the urban areas (Deang *et al.*,1988:38; Smith and Ferry, 1984). In contrast rural residents are more likely to be influenced by role models, as earlier suggested, to fully breastfeed their infants.

Steeper declines in proportions of women still fully breastfeeding their last children at interview are also observed for women with secondary and above education, literates and women currently working away from home. Use of health care facilities appears to be associated with steeper declines in percentage of women still fully breastfeeding. This is shown in the case of those who either delivered in health facilities or were assisted at delivery by health professionals.

4.6 BREASTFEEDING AND SUPPLEMENTATION

Infant food supplementation is the process by which foods other than breastmilk are introduced. Patterns of food supplementation are known to vary widely in different cultures. Introduction of food supplements at too early age could be detrimental to the child's nutritional status which in turn increases its risk of dying. Breastmilk is the ideal source of adequate nourishment a baby needs until about 6 months of age. It has been suggested that even when the mother's milk is ample, supplementation should start not later than six months as this has been observed to be associated with child's poor nutritional status (King, 1992:106; Sharma and Rutstein, 1991:403; Huffman, 1984:172; McCann *et al.*,1981:530). For one reason or the other mothers introduce these supplements at varied ages.

Women still breastfeeding their last child were asked if they had given various types of liquids, including plain water, sugar water, juice, herbal tea, baby formula, fresh milk, soya milk and solid/mushy foods to the child in the last 24 hours. Table 4.10 presents the percentage of children who were currently breastfed and aged 0-24 months and were given various types of liquids or foods, by age of child.

The table shows that plain water was almost universally provided to children currently being breastfed regardless of how young the child is. Thus, even among children aged between 0 and 3 months, over 96 percent were given plain water in the 24 hours prior to the interview. For older children, the proportion given

plain water is only slightly higher (97.4 percent). Though water has no nutritional value, its provision is of interest because it is a potential source of contaminants especially among women who have no access to safe drinking water or those who do not perceive the importance of cleanliness or the need to sterilize the feeding bottles or other feeding utensils being used.

Table 4.10 Percentage of children still being breastfed who are given various types of liquids or solid/mushy foods according to age of child.

SUPPLEMENTS	AGE OF CHILD IN MONTHS:						ALL AGES
	0-3	4-7	8-11	12-15	16-19	20-24	
PLAIN WATER	96.6	95.6	97.4	97.4	97.1	96.8	96.7
SUGAR WATER	8.5	5.3	6.8	4.3	3.8	2.6	5.7
JUICE	4.8	8.3	8.7	10.7	5.2	6.2	7.6
HERBAL TEA	14.2	17.3	13.7	14.6	10.9	15.0	14.6
BABY FORMULA	21.8	20.2	13.9	11.8	5.5	1.7	14.9
FRESH MILK	9.2	10.0	14.1	9.6	11.1	10.0	10.6
SOYA MILK	2.1	3.9	1.8	3.6	6.0	1.3	3.2
S/MUSHY FOOD	7.8	41.3	64.1	71.1	70.3	79.9	49.9
FOOD/LIQUIDS OTHER THAN WATER	49.1	67.6	80.2	81.0	83.0	88.7	71.7

NOTE: S/MUSHY -solid/mushy
Source: NDHS, 1990 Raw data file.

The other liquids or foods have some nutritional value and are therefore likely to have greater effect on the duration and intensity of breastfeeding and consequently affect the extent to which breastfeeding delays the return of fertility in lactating mothers. About half (49.1 percent) of even the youngest age group were provided with at least some food or liquid and approximately seven out of ten breastfed infants age 4-7 months were provided

with some supplemental food. Moreover, solid/mushy foods were introduced rather early. About 8 percent of children 0-3 months of age were given solid/mushy foods in addition to breastmilk. For babies born to under-privileged mothers who have no access to a clean water supply and no proper waste disposal facilities and thus surrounded by very poor and deplorable hygienic conditions, the risks are even higher.

Table 4.11 also presents the mean age at which formula or milk and water and other liquids are given for all children born in the last five years. The table shows that in Nigeria, the mean age at which formula or milk is given to children is less than 2 months (1.8 months). It is lowest in the Southwest (0.9 months) and highest in the Northwest (2.8 months). Urban mothers introduce formula or milk earlier (1.2 months), than their rural counterparts (2.1 months). This pattern also prevails for all age groups of mother. Educational attainment of mother is negatively associated with mean age at introduction of formula or milk. Mothers with secondary and above education introduce formula or milk on the average at 1.2 months, compared to 1.6 and 2.2 months observed for women with primary education and no education respectively.

Table 4.11 Mean age (in months) at which formula or milk and water or other liquids are given by age of mother at birth and some selected characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:				NO OF CHILDREN
	<25	25-34	35+	ALL AGES	
FORMULA OR MILK					
NIGERIA	1.9	1.7	2.0	1.8	3,860
REGION:					
Southeast	1.9	2.0	2.5	2.0	1,261
Southwest	0.7	1.0	1.2	0.9	1,300
Northwest	3.3	2.5	2.0	2.8	590
Northeast	2.2	2.1	3.1	2.3	709
RESIDENCE:					
Urban	1.3	1.1	1.1	1.2	1,260
Rural	2.2	2.0	2.3	2.1	2,600
EDUCATION:					
No Education	2.3	2.1	2.4	2.2	1,826
Primary	2.0	1.5	1.2	1.6	1,209
Secondary+	1.2	1.3	0.7	1.2	825
WATER OR OTHER LIQUIDS					
NIGERIA	0.2	0.2	0.2	0.2	8,499
REGION:					
Southeast	0.1	0.2	0.1	0.1	2,546
Southwest	0.3	0.1	0.3	0.2	1,599
Northwest	0.4	0.3	0.2	0.3	2,370
Northeast	0.2	0.3	0.4	0.3	1,984
RESIDENCE:					
Urban	0.4	0.3	0.6	0.4	1,785
Rural	0.2	0.2	0.2	0.2	6,714
EDUCATION:					
No Education	0.3	0.2	0.2	0.2	5,381
Primary	0.2	0.2	0.4	0.3	2,109
Secondary+	0.2	0.2	0.2	0.2	1,009

Source: NDHS, 1990 Raw data file.

Introduction of water or other liquids in Nigeria takes place before the child is one month and is also observed for the all the selected background characteristics.

Table 4.12 also presents the mean age at which solid or mushy foods are given by age of mother at birth and selected background characteristics.

Table 4.12 Mean age (in months) at which solid or mushy foods are given by age of mother at birth and selected characteristics of mothers.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:				
	<25	25-34	35+	ALL AGES	NO OF CHILDREN*
NIGERIA	5.8	5.6	5.6	5.7	7,359
REGION:					
Southeast	4.8	4.7	4.7	4.7	2,228
Southwest	7.0	7.1	7.5	7.1	1,383
Northwest	5.7	5.3	4.5	5.4	2,058
Northeast	6.3	5.8	6.1	6.1	1,689
RESIDENCE:					
Urban	6.2	6.3	7.2	6.4	1,563
Rural	5.7	5.3	5.3	5.5	5,796
EDUCATION:					
No Education	6.0	5.6	5.4	5.7	4.672
Primary	5.5	5.2	6.3	5.4	1,809
Secondary+	5.8	6.0	6.2	5.9	878

NOTE: * Totals for some of the characteristics are less than the total sample because of missing values,
Source: NDHS, 1990 Raw data file.

The table shows that solid/mushy foods are introduced on the average before the child is 6 months old. Regional differential shows that children of Southeast mothers are given solid/mushy food earliest (4.7 months) while children to Southwest mothers are given solid/mushy food latest (7.1 months).

Rural mothers supplement with solid/mushy food earlier (5.5 months) than their urban counterparts (6.4 months). This pattern also prevails in all age groups. Children born to women with primary education are given solid/mushy foods earlier than their counterparts born to mothers with either no formal education or secondary and above education.

4.7 USE OF FEEDING BOTTLES WITH NIPPLES

Some mothers, who for one reason or the other find it difficult to adequately breastfeed their babies or even after weaning, use feeding bottles with nipples to feed their babies. The use of feeding bottles is one of the western cultures that has already taken a grip on Africa. This practice has often been regarded by many mothers as modern, sophisticated and highly desirable. However, the level of sanitation prevailing in most African societies can make the practice of bottle feeding unsanitary, apart from indicating an early or inappropriate weaning. In addition, feeding bottles are difficult to clean and need to be boiled after every feed. Failure to do this can result in the artificial feeds in feeding bottles being contaminated with bacteria that cause diarrhoea and other infections (King, 1992:28).

Table 4.13 presents the percentage of women with surviving last birth in the last five years preceding the survey who are currently feeding their children from bottles by age of mother at birth and selected background characteristics. At the national level, about 14 percent of women with surviving last birth are currently feeding them from bottles with nipples. Use of feeding bottles is more prevalent among younger (17.1 percent) than older women (10.3 percent).

This pattern is generally observed for most of the selected background characteristics. Use of feeding bottles is more common in the South than in the North and it is most common in the

Southwest (27.4 percent) and least common in the Northwest (6.9 percent).

Table 4.13 Percentage of women with surviving last child who are currently feeding them from bottles according to age of mother at birth and selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER: <25	25-34	35+	ALL WOMEN	NO OF WOMEN*
NIGERIA	17.1	14.5	10.3	14.2	4,721
REGION:					
Southeast	27.1	19.1	6.5	17.7	1,375
Southwest	39.8	26.3	20.5	27.4	923
Northwest	8.6	6.2	6.3	6.9	1,280
Northeast	6.3	8.5	7.9	7.6	1,143
RESIDENCE:					
Urban	29.0	25.6	15.6	24.2	1,015
Rural	14.1	11.2	8.9	11.4	3,707
MOTHER'S EDUCATION:					
No Education	6.5	7.9	8.3	7.7	3,001
Primary	26.0	23.1	14.1	22.6	1,148
Secondary+	32.7	30.3	31.2	31.4	573
PLACE OF WORK:					
Not Working	18.4	12.7	8.0	14.1	1,503
Working at home	11.9	13.2	6.5	11.1	1,111
Working away	18.6	16.4	13.0	16.1	2,066
WOMEN'S OCCUPATION:					
Agric/For/Fish.	7.5	10.6	10.5	9.9	2,711
White collar	38.4	32.0	13.4	28.5	726
Sales & Services	19.8	16.4	10.9	15.8	1,172
PLACE OF DELIVERY:					
Home	10.9	9.5	7.7	9.5	3,172
Medical centres	32.0	24.9	14.6	24.0	1,428
Other places	40.9	13.6	21.2	22.9	122
ASSISTANCE AT DELIVERY:					
Medical Pers.	31.4	25.1	15.7	24.2	1,538
TBA	15.1	12.1	3.0	11.0	1,048
Others/No one	9.6	7.5	9.4	8.6	2,131
HUSBAND'S EDUCATION:					
No Education	7.0	6.6	7.3	6.9	2,518
Primary	19.4	18.7	13.9	17.8	1,250
Secondary+	33.4	30.3	19.3	29.9	882

Note:Agric/For.-agric, forestry and fishing, Pers.-personnel,
* Totals for some of the characteristics do not add to the total sample because of missing values,

Source: NDHS, 1990 Raw data file.

The contrast between North and South in the use of feeding bottles may be partly due to the penetration of Western education and life styles which is more in the South than in the North.

The table also shows that use of feeding bottles is positively associated with the level of education. This finding is expected as women with some education are more likely to see the use of feeding bottles as modern, more fashionable and therefore, desirable. They are also more likely to be employed in public sector jobs which may not be very compatible with full breastfeeding, hence the need for early supplementation and use of feeding bottles. Women with no or less education on the other hand, may not see the need for it because they have more time to breastfeed their children.

A higher proportion of women in white collar jobs are observed to be using feeding bottles compared to those in Agriculture or Sales and services occupations. Similarly, a higher proportion, women married to men with secondary and above education are using feeding bottles compared to those married to men with primary or no education. As earlier observed with characteristics of survey respondents, there is tendency for women to marry husbands in the same educational or occupational group. It follows that most of the women married to men with secondary and above education also have secondary and above education. On the other hand, husbands can also exert some influence on the wife. Use of feeding bottles is more common with women who delivered in medical centres (24 percent) compared to those who delivered at home (9.5 percent) or other places (22.9 percent). It is also more common with births assisted

at delivery by medical personnel (24 percent) than those assisted at delivery by traditional birth attendants (12.6 percent) or others or no one (8.3 percent). This finding is consistent with the results obtained using 22 DHS conducted from 1986-1989 to determine the prevalence of bottle feeding (Boerma ***et al.***,1991). The positive association between use of feeding bottles and use of modern health care facilities may also be a manifestation of influences of the marketing of infant formulas and other infant products through health services in the past. Sales representatives from commercial firms made the rounds at maternity clinics advertising breastmilk substitutes. Free milk samples were also commonly distributed in hospitals to postpartum women (Huffman, 1984:178; Berg, 1978:273). These may have left their marks by making the use of breastmilk substitute and consequently feeding bottles more appealing to postpartum women. The country only took a concrete action geared towards implementing the international code of marketing breastmilk substitutes, which was adopted by the 34th World Health Assembly in May 1981, by promulgating a decree in December 1990 (UNFPA, 1990:545-548; Federal Republic Of Nigeria, 1990:A623-6). Major provisions of the decree relates to the import, sale, promotion and labelling and advertising of breast milk substitutes. The decree also stated that public and private institutions engaged in health care delivery have a duty to promote and protect breastfeeding.

Use of feeding bottles is more common in the urban (24.2 percent) than rural areas (11.4 percent). This may be due to the availability of these breastmilk substitutes which are likely to be

higher in urban than rural areas. Urban women are more likely to have comparatively better access to information on availability of the alternatives to breastfeeding especially through the mass media in the urban areas.

The health risks of bottle feeding compared to breastfeeding have been found to be greatest among the urban and rural poor in developing countries, who may not use breastmilk substitutes preparations correctly. This may be as a result of ignorance or inability to afford an adequate supply (McCann ***et al***.,1981). Use of feeding bottles can also result in the infant rejecting the mother's breastmilk especially if it finds it easier to suck and adequately more filling.

4.8 FREQUENCY OF BREASTFEEDING

The frequency of breastfeeding plays a significant role in the maintenance of postpartum amenorrhea (Sharma and Rutstein, 1991:403; Huffman, 1984:170; McCann et al.,1981:530). Frequent suckling apart from stimulating the production of prolactin which helps the production of breastmilk is also known to be associated with higher probability of continuation of breastfeeding and lower probability of return of fertility (King, 1992:100; Khan, 1990:80). The frequency of breastfeeding in the past 24 hours can measure the degree of breastfeeding practice and indicates to what extent breastfeeding is being supplemented.

Table 4.14 gives the percentage distribution of currently breastfeeding women according to frequency of feeds in the last 24

hours for births six months and below. About eight percent of women with babies aged 6 months and below breastfed six times or below per day compared to about 92 percent who breastfed seven times or more per day. The mean number of feeds for the country is 12.6. In the regions, a higher proportion of currently breastfeeding women breastfeed six times or below in the Southwest compared to the other three regions. Mean number of feeds, is however, highest in the Southeast (14.8 times) and lowest in the Northwest (10.7 times). Proportion of currently breastfeeding women who breastfeed six times and below per day is positively associated with the level of education and literacy and slightly higher in the urban (9.2 percent) than in the rural area (8.1 percent). Mean number of feeds is lowest for those with secondary and above education and highest for women with primary education. The mean number of feeds is also observed to be negatively associated with the level of literacy. Rural women breastfed on the average more frequently than their urban counterparts. This is expected as educated or urban women are more likely to practise scheduled breastfeeding rather than demand feeding (McCann ***et al.***,1981:533, 542-543).

The proportion of women breastfeeding six times and below a day is slightly higher for women currently working away from home compared to their counterparts either working at home or not working. Proportion of women breastfeeding 6 times and below per day is also higher for women who had delivered in medical centres or who were assisted at delivery by medical personnel. The mean

number of feeds for births delivered at home is higher than for those delivered at medical centres.

Table 4.14 The percentage distribution of currently breastfeeding women according to number of feeds in the last 24 hours and selected background characteristics (for births six months and below).

SELECTED CHARACTERISTICS	TOTAL FEEDS: <=6 feeds	>6 feeds	TOTAL PERCENT	MEAN NO OF FEEDS	NO OF BIRTHS
NIGERIA	8.3	91.7	100.0	12.6	866
REGION:					
Southeast	7.1	92.9	100.0	14.8	277
Southwest	12.9	87.1	100.0	11.5	165
Northwest	6.8	93.2	100.0	10.7	192
Northeast	7.8	92.2	100.0	12.2	232
RESIDENCE:					
Urban	9.2	90.8	100.0	12.2	187
Rural	8.1	91.9	100.0	12.6	679
EDUCATION:					
No Education	6.8	93.2	100.0	12.4	494
Primary	9.8	90.2	100.0	13.2	256
Secondary+	11.4	88.6	100.0	11.5	116
LITERACY:					
Easily	11.8	88.2	100.0	12.0	192
With Difficulty	10.9	89.1	100.0	12.0	130
Not at all	6.5	93.5	100.0	12.9	543
PLACE OF WORK:					
Not Working	7.4	92.6	100.0	11.7	352
Working at Home	8.0	92.0	100.0	12.5	191
Working Away	9.6	90.4	100.0	13.6	319
OCCUPATION:					
Agric/For/Fish.	9.4	90.6	100.0	13.6	198
White Collar	8.0	92.0	100.0	12.8	40
Sales & Service	8.8	91.2	100.0	12.8	275
PLACE OF DELIVERY:					
Home	7.1	92.9	100.0	12.4	556
Medical centre	10.9	89.1	100.0	12.9	280
Other places	7.2	92.8	100.0	13.6	29
ASSISTANCE AT DELIVERY:					
Medical Pers.	11.4	88.6	100.0	12.8	310
TBA	6.2	93.8	100.0	13.5	208
Others/No one	6.9	93.1	100.0	11.9	346

NOTE: Agric/For/Fish.-agriculture, forestry and fishing, Pers.-personnel, * Totals for some of the characteristics are less than the total sample because of missing values,
Source: NDHS, 1990 Raw data file.

Similarly, it is also observed to be higher for births assisted at deliveries by traditional birth attendants (TBA) and others/no one.

Table 4.15 presents the percentage distribution of currently breastfeeding women according to their daylight and nighttime frequency of breastfeeding (based on births 6 months and below). About 36 percent of women breastfeed 3 times and below at nighttime, compared to about 9 percent breastfeeding 3 times and below during the day. This pattern of reduced number of women frequently breastfeeding at nighttime is evident for all the selected background characteristics. The table also shows generally, the intensity of nighttime breastfeeding is lower in the North than in the South, lower in the rural than urban. The proportion of women breastfeeding more than 3 times in the night increases with the level of education. The proportion of women breastfeeding more than 3 times in the night are higher for women who delivered their babies in the medical centres or are assisted at delivery by medical personnel compared to their counterparts who delivered at home or are assisted by TBAs. When viewed alongside daylight feeds, the table tends to suggest that some women possibly make up for reduced breastfeeding in the daylight possibly due to work commitments. For example, women who currently work away from home tended to breastfeed more in the night with about 77 percent of them breastfeeding their babies more than 3 times in the night as opposed to their daylight breastfeeding behaviour which indicates that a lower proportion of them breastfeed more than three times.

Table 4.15 Percentage distribution of women currently breastfeeding babies aged six months and below according to the frequency of nighttime and daylight feeds and selected background characteristics.

SELECTED CHARACTERISTICS	DAYLIGHT FEEDS: NUMBER OF FEEDS:		TOTAL PERCENT	MEAN	NO OF BIRTHS*	NIGHTTIME FEEDS: NUMBER OF FEEDS:		TOTAL PERCENT	MEAN	NO OF BIRTHS*
	<=3	>3				<=3	>3			
NIGERIA	9.0	91.0	100.0	7.4	936	35.7	64.3	100.0	5.1	936
REGION:										
Southeast	9.3	90.7	100.0	8.4	277	27.4	72.6	100.0	6.3	277
Southwest	15.1	84.9	100.0	6.5	165	31.4	68.6	100.0	5.0	165
Northwest	3.8	96.2	100.0	6.8	262	40.6	59.4	100.0	3.9	262
Northeast	10.3	89.7	100.0	7.3	232	43.0	57.0	100.0	4.9	232
RESIDENCE:										
Urban	14.9	85.1	100.0	6.9	191	30.7	69.3	100.0	5.4	191
Rural	7.5	92.5	100.0	7.6	679	36.9	63.1	100.0	5.0	746
EDUCATION:										
No Education	6.6	93.4	100.0	7.5	556	37.0	63.0	100.0	4.9	556
Primary	10.8	89.2	100.0	7.7	262	34.8	65.2	100.0	5.6	262
Secondary+	16.5	83.5	100.0	6.4	98	31.3	68.7	100.0	5.1	118
LITERACY:										
Easily	14.5	85.5	100.0	6.8	196	32.6	67.4	100.0	5.3	196
With Difficulty	13.1	86.9	100.0	7.2	133	42.8	57.2	100.0	4.8	133
Not at all	6.4	93.6	100.0	7.7	606	35.2	64.8	100.0	5.1	606
PLACE OF WORK:										
Not Working	8.4	91.6	100.0	7.0	361	47.2	52.8	100.0	4.7	361
Working at Home	7.8	92.2	100.0	7.4	199	37.7	62.3	100.0	5.1	199
Working Away	10.4	89.6	100.0	7.9	372	23.1	76.9	100.0	5.7	372
OCCUPATION:										
Agric/For/Fish.	9.8	90.2	100.0	8.1	210	27.6	72.4	100.0	5.5	210
White Collar	15.1	84.9	100.0	7.0	40	29.4	70.6	100.0	5.8	40
Sales & Service	8.5	91.5	100.0	7.5	324	28.5	71.5	100.0	5.3	324
PLACE OF DELIVERY:										
Home	6.8	93.2	100.0	7.5	556	38.3	61.7	100.0	4.9	618
Medical centre	13.7	86.3	100.0	7.3	280	29.4	70.6	100.0	5.6	289
Other places	10.1	89.9	100.0	7.7	29	43.1	56.9	100.0	4.2	29
ASSISTANCE AT DELIVERY:										
Medical Pers.	13.5	86.5	100.0	7.3	310	30.8	69.2	100.0	5.4	319
TBA	5.9	94.1	100.0	8.1	208	40.1	59.9	100.0	5.4	208
Others/No one	7.2	92.8	100.0	7.1	346	36.9	63.1	100.0	4.6	408

NOTE:Agric/For/Fish.-agriculture, forestry and fishing, Pers.-personnel, * Totals for some of the characteristics do not add up to the total sample because of missing values,
Source: NDHS, 1990 Raw data file.

As expected, the mean number of feeds at nighttime is less than at daylight. Mothers and their babies are likely to be sleeping, and may only wake up occasionally when the baby is crying or when it is scheduled time to breastfeed it.

Night-time and daylight mean number of feeds are highest in the Southeast region. While mean nighttime feeds is lowest in the Northwest, mean daylight feeds is lowest in the Southwest region. The mean number of daylight feeds is generally observed to be higher in the rural than urban areas and approximately decreases with increase in the level of education. As earlier mentioned, this may be a result of the practice of scheduled feeding likely to be more common with the more educated and urban residents as opposed to demand feeding which is more likely to be practised by rural residents and the less educated.

Place of work appears not to show the expected effect on the frequency of breastfeeding as women who work away from home generally breastfed most frequently both at daylight and nighttime. The younger births used in the analysis may partly account for the unexpected result. For a significant part of the period, even women who are in public sector jobs, who are expected to experience some conflict between work and breastfeeding, are most likely to be on leave. However, women engaged in white collar jobs breastfed less frequently at daylight and more frequently at nighttime compared to their counterparts in sales and services and agricultural-related occupations.

4.9 ESTIMATION OF DURATION OF ANY AND FULL BREASTFEEDING

To estimate the mean duration of breastfeeding for the country and various subgroups, the prevalence/incidence method already described in chapter 2 is used. The underlying assumption for this

method, as earlier mentioned, is that the average number of births per month has been constant throughout the fixed period preceding the survey. The average number of births are estimated by summing the number of births over the period 1-36 months preceding the survey. This is done to overcome problems of seasonality, possible reference period errors and to minimize effects of transfer of births across chosen boundary due to birth date misreporting and birth displacement (Boerma and Sommerfelt, 1994:113).

4.9.1 Mean Duration of Any Breastfeeding

Table 4.16 presents the mean duration of any breastfeeding by age of mother at birth and selected background characteristics. Though these background characteristics do not seem to have significant impact on the proportion of children ever or never breastfed, however the duration of breastfeeding varies markedly by various categories of these characteristics.

The table shows that in Nigeria, breastfeeding is both nearly universal and prolonged. The near universal practice of breastfeeding is possibly because most parents and communities perceive breastfeeding as good for the welfare of the child. In some societies, breastfed babies are also believed to develop certain sentiments towards their mothers. In later years, the sentiments could be so strong that they are often translated into physical and financial rewards for the mother (Orubuloye, 1987:336).

Table 4.16 Prevalence/Incidence estimates of mean duration of any breastfeeding (in months) according to age of mother at birth and selected background characteristics.

CHARACTER-ISTICS	AGE OF MOTHER AT THE BIRTH:				PERCENT	TOTAL
	<25	25-34	35+	ALL WOMEN	B/FED	BIRTHS
NIGERIA	18.5	21.1	24.3	20.4	97.4	9,157
REGION:						
SouthEast	17.1	18.6	20.2	18.3	98.0	2,719
SouthWest	17.4	17.1	20.3	17.8	97.2	1,683
NorthWest	19.4	25.7	34.4	23.6	97.1	2,568
NorthEast	19.5	23.5	24.4	21.5	97.2	2,187
RESIDENCE:						
Urban	14.9	18.3	17.4	16.8	97.4	1,911
Rural	19.4	22.0	25.9	21.4	97.4	7,245
WOMEN'S EDUCATION:						
No Education	19.2	22.2	26.0	21.7	97.5	5,828
Primary	18.3	20.6	18.3	19.3	97.3	2,269
Secondary+	16.8	16.5	(12.6)	16.5	97.4	1,059
ACCESS TO MEDIA:						
No Access	20.6	22.5	27.7	22.4	97.7	4,206
Have Access	16.8	20.0	20.7	18.7	97.2	4,947
RELIGION:						
Christianity	17.3	18.5	22.5	18.6	97.8	3,986
Islam	19.4	24.1	27.0	22.1	97.1	4,681
Others	17.5	18.7	20.6	18.9	97.0	486
USE OF CONTRACEPTION:						
Never used	19.4	22.2	25.9	21.4	97.5	7,863
Ever used	12.1	15.2	15.5	14.1	96.7	1,293
SEX OF CHILD:						
Boy	19.1	21.8	23.6	20.8	97.0	4,562
Girl	17.9	20.4	24.9	20.0	97.8	4,595
ASSISTANCE AT DELIVERY:						
Med.Personnel	16.8	18.1	18.3	17.6	96.6	2,959
TBA	16.5	22.9	21.1	19.5	97.5	2,110
Others/No one	21.8	22.9	30.3	23.0	97.9	3,969
PLACE OF WORK:						
Not working	19.7	22.8	27.8	21.6	97.6	2,864
Work at home	16.1	21.0	17.8	18.7	96.6	2,232
Work away	18.5	20.6	26.5	20.7	97.7	3,986
OCCUPATION:						
Agr/For/Fish	19.8	21.8	23.9	21.3	97.8	2,507
White collar	20.4	15.7	(13.0)	17.3	97.1	382
S & Services	15.7	20.2	23.6	19.0	97.0	3,391

NOTE: Agric/For/Fish.-agriculture, forestry and fishing, Med.-medical, B/FED-breastfed, S -sales,
* Totals for some of the characteristics are less than the total sample because of missing values, .
Source: NDHS, 1990 Raw data file.

About 97.4 percent of all children born in the five years preceding the survey were breastfed; the mean duration of any breastfeeding was 20.4 months. Children born to women below 25 years were breastfed about 5 months less on the average than children born to women aged 35-49. In the regions, the mean duration ranges between 17.8 months in the Southwest and 23.6 months in the Northwest. Children born to Northern respondents were on the average breastfed longer than their Southern counterparts. The mean durations of breastfeeding in the Northern regions are very close to 24 months which is known to be favoured by Islam, the religion that predominates in the North (Koran Sura, 31:14, 2:233). The higher mean duration of breastfeeding in the North may therefore be as a result of the adherence to the teachings of Islam on breastfeeding by the Muslims. On the other hand, the urban/rural distributions of respondents in the regions also indicate higher proportions of rural respondents in the Northern regions (over 80 percent). The higher breastfeeding duration observed in the Northern regions may also be a result of higher proportion of rural respondents. Rural residents are known to have traditional pattern of prolonged breastfeeding.

Though equal percentage of children born to rural and urban women (97.4 percent) are breastfed, however the mean duration of any breastfeeding for children of rural residents (21.4 months) is over 5 months longer than that of their urban counterparts (16.8 months). In all age groups, the average duration of breastfeeding is systematically shorter by at least 3 months among children born

to urban women. The mean duration of breastfeeding is also observed to be negatively associated with level of education. These findings agree with those reported in similar studies in Pakistan and in the recent analysis of 47 Demographic and Health Surveys (Trussell *et al.*,1992:300-303; Page *et al.*,1982:33-34). The differential may be because cultural norms that support prolonged breastfeeding are still very strong in the rural areas. Urban women may also lack the social enforceability of these norms. In addition, in urban areas, there is availability of breastmilk substitutes. There is also the question of convenience of breastfeeding for mothers in urban centres, who are more likely to be employed in modern sector occupations. Moreover, urban residents are more educated and acquisition of western education may have made them to view breastfeeding as old fashioned, backward custom or a vulgar peasant practice. This finding appears to lend credence to the claim that decline in breastfeeding is probably due to the encroaching influences of urbanization and modernization and new social values. It has even been suggested that failure of breastfeeding practice may be one of the responses to the stresses of modernization (Berg, 1978:272).

Births to women with no access to media (who did not listen to radio or watch a TV at least once a week) are breastfed for longer durations (22.4 months) than those who have access to mass media (18.7 months). This may likely be because access to mass media may have exposed women to alternatives to breastfeeding or availability of breastmilk substitutes. On the other hand, women with no access

to mass media may not readily know the available alternatives to breastfeeding. Consequently they are more likely to still hold fast to the traditional practice of prolonged breastfeeding.

The muslims on the average breastfed their children longer (22.1 months) than Christians (18.6 months). This pattern is also true for all age groups with the difference in means ranging between 2 and 5 months. As earlier explained, the longer durations of breastfeeding observed among Muslims may be in obedience to the teachings of the holy Koran. Women who had ever used contraception breastfed for shorter duration (14.1 months) than those who had never used any method (21.4 months) showing that the variable ever use is associated with sharply reduced breastfeeding. However since the ever used, by its definition, made no reference to the period of use, this may likely blur the expectations about the directions of influence between contraception and breastfeeding.

The average duration of breastfeeding for male children, though very close, is longer (20.8 months) than for females (20.0 months) and is also observed for categories of age groups of mother at birth except for 35-49 age group where girls are also breastfed longer than boys. Assistance at delivery differentials in mean duration of breastfeeding indicate that births that were assisted at delivery by medical personnel (Doctors, Nurses, Midwives, Auxiliary midwife, or village health worker) are breastfed on the average for about 17.6 months compared to (19.5 months) observed for those assisted by traditional birth attendants (TBAs). Women assisted by health professionals were possibly exposed to their

beliefs and practices. Health professionals who consider infant formula to be as good as, if not better than breastmilk, could have influenced mothers' views of the adequacy of their breastmilk for the children's health. The activities of health professionals may also be influenced by both inadequate training and promotional activities of infant formula industries (Huffman, 1984:175; WHO, 1981).

Women who were not currently working breastfed their children for 21.6 months compared to 18.7 and 20.7 months observed respectively for women currently working at home and currently working away from home. This finding may be because those not currently working have more time to breastfeed, hence the longer duration. On the other hand, women who were currently working are more likely, because of work commitments, to find breastfeeding practice less appealing or conducive, hence the shorter duration. They are also likely to be economically in a position to buy breastmilk substitutes to feed their children.

Breastfeeding is expected to be less conducive for women working away from home than those working at home or not working. The table however revealed that women working away breastfeed for about 2 months longer than those working at home. It is, however, possible that the difficulty in breastfeeding for those who work away may have been resolved by higher level of supplementation while still maintaining long durations. On the other hand, work away from home includes many types of occupations, some of which may readily allow the mother and child to be together.

Duration of breastfeeding according to women's occupation indicates that women in agricultural-related occupations breastfed for between 2 to 4 month longer than the other occupations. They are largely rural women who are still traditional in their ways of life. Agricultural employment is usually the role for women in most traditional societies. Breastfeeding is convenient for them because the activities they perform allow frequent and intense breastfeeding (Orubuloye, 1987:336). Women in agricultural-related occupations are therefore more likely to find breastfeeding more convenient while at work than their counterparts in white collar jobs. As expected, those in white collar occupations breastfed shortest.

4.9.2 Mean Duration of Full Breastfeeding

Table 4.17 presents the mean duration of full breastfeeding according to age of mother at birth and selected background characteristics. The duration of full breastfeeding for the country is about 4.0 months and is observed to approximately increase with age of mother at the birth. While Northern mothers fully breastfed for about 5.0 months, Southwest and Southeast mothers fully breastfed for about 2.0 and 3.0 months respectively. Just as observed for any breastfeeding, mean duration of full breastfeeding is higher in the rural than urban areas in the country. The table also shows that duration of full breastfeeding is negatively associated with women's level of education.

Table 4.17 Prevalence/Incidence estimates of mean duration of full breastfeeding (in months) according to age of mother at birth and selected background characteristics.

CHARACTER-ISTICS	AGE OF MOTHER AT BIRTH:			All Women	PERCENT B/FED	TOTAL BIRTH*
	<25	25-34	35+			
NIGERIA	3.3	4.7	4.2	4.0	97.4	9,157
REGION:						
SouthEast	2.7	3.5	2.7	3.0	98.0	2,719
SouthWest	0.8	2.8	1.9	2.0	97.2	1,683
NorthWest	4.9	6.8	6.4	5.3	97.1	2,568
NorthEast	4.6	5.8	6.6	5.3	97.2	2,187
RESIDENCE:						
Urban	1.7	3.2	2.7	2.5	97.4	1,911
Rural	3.7	5.1	4.7	4.4	97.4	7,245
WOMEN'S EDUCATION:						
No Education	4.0	5.1	4.7	4.6	97.5	5,828
Primary	3.1	4.8	2.7	3.8	97.3	2,269
Secondary+	1.5	1.8	-	1.6	97.4	1,059
ACCESS TO MEDIA:						
No Access	3.5	5.4	4.8	4.5	97.7	4,206
Have Access	3.1	4.0	3.5	3.6	97.2	4,947
RELIGION:						
Christianity	2.4	3.5	3.3	3.0	97.8	3,986
Islam	4.0	5.9	5.0	4.9	97.1	4,681
Others	1.9	4.5	5.1	3.9	97.0	486
USE OF CONTRACEPTION:						
Never used	4.1	5.2	4.4	4.4	97.5	7,863
Ever used	1.6	1.5	2.9	1.7	96.7	1,293
SEX OF CHILD:						
Boy	3.5	5.5	4.3	4.4	97.0	4,562
Girl	3.1	3.9	4.1	3.6	97.8	4,595
ASSISTANCE AT DELIVERY:						
Med.Personnel	2.2	3.2	2.8	2.8	96.6	2,959
TBA	2.7	6.4	4.4	4.3	97.5	2,110
Others/No one	4.3	5.1	5.2	4.7	97.9	3,969
PLACE OF WORK:						
Not working	4.5	7.0	8.2	5.8	97.6	2,864
Work at Home	2.1	4.8	3.4	3.5	96.6	2,232
Work Away	2.5	3.4	2.5	2.9	97.7	3,986
OCCUPATION:						
Agr/For/Fish	2.5	4.5	2.7	3.4	97.5	2,507
White collar	1.5	2.3	(2.9)	2.1	95.5	382
S & Services	2.3	3.6	3.4	3.1	97.4	3,391

NOTE: Agric/For/Fish.-agriculture, forestry and fishing, B/FED-breastfed, Med.-medical, S -sales,
* Totals for some of the characteristics are less than the total sample because of missing values,
Source: NDHS, 1990 Raw data file.

Women with access to mass media fully breastfed for shorter durations than their counterparts who have no access to mass media. Duration of full breastfeeding is generally observed to be longer for Muslims than Christians in all age groups. Duration of full breastfeeding by sex of the child indicates that male children were breastfed slightly longer than females in the country for all categories of age of mother at the birth.

The table also indicates that those who were assisted at delivery by TBAs fully breastfed longer than those who were assisted by health professionals. This pattern is consistent in all age categories of mother at birth.

Full breastfeeding practice and place of work results appear to have really shown the expected effect of work on breastfeeding. Currently working women (working at home or working away) fully breastfed their children for shorter durations than their counterparts not working in the country and for all age groups of mothers. Even with respect to place of work, the data show that women who work at home fully breastfed their children longer than those working away from home for all women and for all age groups of mothers except those below 25 years, where, though very close, women working away fully breastfed longer than those working at home. This result may either be due to sampling fluctuations or that many of those working away were able to have their children nearby to do full breastfeeding. Even women employed in public sector jobs outside the home are also granted maternity leave that

gives some room for full breastfeeding at least during the period of leave which in most cases may last for about three months.

When women's occupation is considered, the table indicates that those in white collar jobs fully breastfed shorter than those in agricultural-related occupations. This pattern is generally true for all the age categories of mother. As observed in the case of any breastfeeding, women in agricultural occupations fully breastfed longest.

4.9.3 Duration of Breastfeeding based on all surviving children.

As earlier found, a high proportion of children who were never breastfed were dead children. Even for some dead children that were ever breastfed, breastfeeding was also truncated as a result of infant deaths. Indeed some of them were actually breastfed until death. Table 4.18 gives estimates of mean duration of any and full breastfeeding for children who survived to the survey according to age of mother at the birth and selected background characteristics.

About 99.3 percent of all surviving children were breastfed and the average mean duration was 23.0 months. The mean duration of any breastfeeding is positively associated with age of mother at birth. Mean duration of breastfeeding in the regions ranged between 19.5 months in the Southwest and 27.7 months in the Northwest. Like in the case of all children, mean duration of any breastfeeding is higher in the rural than urban area for surviving children. Duration of any breastfeeding for surviving children is negatively associated with level of education. Women who were not currently

working breastfed longer than those currently working at home or away from home. Full breastfeeding practice for surviving children shows the same pattern like any breastfeeding. The durations are however progressively longer than estimates obtained for all children.

Table 4.18 Prevalence/Incidence estimates of mean duration of breastfeeding according to age of mother at birth and selected background characteristics (all surviving births 36 months before the survey).

SELECTED CHARACTERISTICS	ANY BREASTFEEDING: AGE OF MOTHER AT BIRTH: <25	25-34	35+	ALL WOMEN	FULL BREASTFEEDING: AGE OF MOTHER AT BIRTH: <25	25-34	35+	ALL WOMEN	PERCENT B/FED	TOTAL BIRTHS*
NIGERIA	21.1	23.4	28.1	23.0	3.8	5.2	4.9	4.5	99.3	7,881
REGION:										
Southeast	18.6	20.5	23.5	20.2	2.9	3.8	3.1	3.4	99.5	2,422
Southwest	18.9	18.5	23.2	19.5	0.9	3.1	2.1	2.2	99.7	1,479
Northwest	23.4	29.1	41.4	27.7	4.5	7.6	7.6	6.2	99.3	2,113
Northeast	22.2	26.2	27.7	24.4	5.3	6.4	7.5	6.0	98.7	1,867
RESIDENCE:										
Urban	16.6	20.0	19.5	18.6	1.9	3.5	3.0	2.8	99.5	1,710
Rural	22.2	24.5	30.2	24.2	4.2	5.7	5.3	5.0	99.2	6.171
EDUCATION:										
No Education	22.4	25.0	29.5	24.8	4.6	5.7	5.3	5.2	99.2	4,923
Primary	20.6	22.4	22.8	21.6	3.5	5.3	3.3	4.3	99.4	1,990
Secondary+	18.1	17.6	16.8	17.8	1.6	1.8		1.7	99.7	967
PLACE OF WORK:										
Not Working	22.3	25.5	31.5	24.3	5.1	7.8	9.3	6.5	99.2	2,456
Working at home	19.1	23.8	21.4	21.7	2.4	5.4	4.1	4.1	99.0	1,857
Working away	20.7	22.4	30.0	22.9	2.8	3.7	2.9	3.2	99.5	3,506

NOTE: * Totals for some of the characteristics are less than the total sample because of missing values.
Source: NDHS, 1990 Raw data file.

4.10 SUMMARY

Despite the effects of urbanization and modernization and changes in life styles in the past decades, the analyses in this chapter have shown that women in the country maintained a high rate of initiation of breastfeeding. An overwhelming proportion (97.4 percent) of children born five years before the survey were

breastfed irrespective of the socio-economic and demographic characteristics of their mothers.

The analysis has also shown that about one third of last births ever breastfed were put to the breast immediately after delivery, while almost 40 percent were put to the breast days later. In general, rural and less educated women and those assisted at delivery by traditional birth attendants were more likely to put their children to the breast immediately after delivery compared with the urban, the more educated and women who were assisted at delivery by medical personnel. The analysis also shows that there is no noticeable sex differential in the timing of initiation of breastfeeding. However, a very high proportion of dead children were put to the breast days later.

Analysis of colostrum feeding practice indicates that almost 60 percent of last births ever breastfed were fed colostrum. Colostrum feeding is highest in the Southeast and lowest in the Northwest, higher in urban than rural area and positively associated with level of education and literacy. Women assisted at delivery by medical personnel were more likely to feed colostrum than their counterparts assisted at delivery by traditional birth attendants.

About 60 percent of women who deliberately waited for colostrum to pass fed their babies with plain water. Other items fed while waiting for colostrum to pass include sugar/glucose water, fresh milk and baby formula. Feeding of fresh milk is more common in rural areas, among less educated and Northern mothers.

Data on breastfeeding in the open interval show that about 58 percent of women with surviving last birth were still breastfeeding at the time of the survey. This proportion is made up of 46.6 percent breastfeeding with supplements, 10.9 percent breastfeeding with plain water only and 0.5 percent exclusively breastfeeding. Urban, more educated, currently working women and christians are less likely to be currently breastfeeding compared to rural, less educated, not currently working and muslims. Breastfeeding at selected ages indicate steeper declines for higher education, urban women and those who deliver at medical centres compared with their counterparts with less education, rural and those who delivered at home.

Breastfeeding is supplemented very early in the country. Thus the observed long durations of breastfeeding reported by mothers typically include substantial periods of mixed feeding. Even more intriguing are the items fed which include herbal tea, which was fed to about 14 percent of last births, aged less than 3 months. Solid and mushy food is also observed to be introduced very early. The mean age at introduction of formula or milk is less than 2 months in the country. While the mean age at introducing water is less than one month, for solid/mushy food, it is about 6 months. The mean ages of supplementation for various background characteristics vary very slightly in the country.

About 14.2 percent of all surviving last births were being fed using feeding bottles with nipples. Use of feeding bottles is more common in the South than in the North. Proportion using feeding

bottles is positively associated with women's education, husband's education, use of modern health care and urban residence. The mean number of feeds in the last 24 hours in country is about 12. While mean number of daylight feeds is about 7, for nighttime it is about 6. The frequency of feeds varies very slightly in the regions. It is inversely associated with women's level of education.

The mean duration of any breastfeeding is 20.4 months and it is positively associated with age of mother at birth of the child. Regional differentials in breastfeeding patterns are also evident and reveal that children are breastfed for shortest durations in the Southwest (17.8 months) and for longest durations in the Northwest (23.6 months). Mean duration of any or full breastfeeding is negatively associated with women's education, urban residence, use of contraception and access to mass media. While there is no significant sex differential in mean duration of breastfeeding, lower mean duration of breastfeeding is associated with use of modern health care facilities.

While women not currently working breastfed slightly longer than those currently working, the data indicated that women working away from home breastfed longer than their counterparts working at home. Full breastfeeding practice however gave the expected pattern of shorter duration of breastfeeding for those currently working away from home as compared to their counterparts not currently working or working at home respectively. Women in agricultural-related professions breastfed longer than their counterparts in white collar or sales and services jobs.

CHAPTER V

CORRELATES OF BREASTFEEDING INCIDENCE AND BEHAVIOUR

5.1 INTRODUCTION

From the analysis in the last chapter, it is obvious that a woman's decision to initiate and continue breastfeeding and the duration of breastfeeding is influenced by many socio-demographic factors. It is also known that many of these factors are themselves related. It is therefore necessary while looking at one factor, to take others into account. This requires a multivariate statistical technique. Another difficulty is identifying and accounting for a large number of factors that possibly influence breastfeeding behaviour. This is not possible considering the nature and content of the available data and limitations of the various techniques of analysis.

With this in view, the effects of some of the already identified factors on incidence and continuation of breastfeeding, duration, frequency of breastfeeding, age at given supplements and use of feeding bottles are examined using multivariate analysis techniques.

5.2 CORRELATES OF ANY AND FULL BREASTFEEDING INCIDENCE AND CONTINUATION.

Analysis in this section is based principally on the breastfeeding current status information gathered from the respondents at the time of the interview, such as whether or not a respondent was still breastfeeding their last births. The decision

here is to model the probability that a mother was still breastfeeding the last child at the time of interview. This gives rise to a dichotomous variable that would cause problems for the classic ordinary least squares form of regression, but are appropriately incorporated in the logistic regression model (Halli and Rao, 1992:101; Norusis, 1992:1).

A major advantage of the logistic regression technique is that it requires fewer number of assumptions. It directly estimates the probability of an event occurring. The parameters of the model are estimated using the maximum-likelihood method. More information on logistic regression technique is given elsewhere and in chapter 2 of this thesis (Halli and Rao, 1992:101-112; Potter *et al.*,1987:311-313).

The fitted logistic regression models used incidence of full and any breastfeeding as the dependent variables. The choice of explanatory variables is based on the results obtained in the cross-tabulations carried out in the last chapter. They include maternal age, education, region and current place of residence, place of work, age of child, desire for more children, assistance at delivery and current use of contraception. Age of child and its square were used as controls. The model was fitted on two samples of births (births 24 months and below and births 12 months and below).

One limitation of the model is that it is the experience of women whose children are aged between 0 and 24 months, resulting in the possibility of our regression being affected by the selectivity

inherent in such a sample of open intervals. In addition, modelling current breastfeeding status of women at disparate durations with the same set of covariates, some salient differences between the covariates of early and late weaning may be missed.

The decision to use two samples of births is premised on both methodological and substantive reasons to explore the correlates of breastfeeding continuation in the first year of life.

5.2.1 Correlates of Any Breastfeeding Continuation

The probability that a mother was still breastfeeding her last child at the time of interview was examined first among births 24 months and below. The method used is the backward step logistic regression model, where all the explanatory variables are present at the beginning of the procedure. Insignificant variables are progressively dropped until when only the significant variables are left. The analysis included only women whose last births survived to the time of interview in order to remove the effects of mortality.

Table 5.1 presents the parameter estimates for the logistic regression model on variables explaining the probability of still breastfeeding. In the model, all variables except 'wants more children' were retained. The variables included in the model gave an overall prediction of 90 percent. The global test for the significance of the model is 949.811 with 15 degrees of freedom, and is significant at $p < 0.00001$. Thus, at least one of the predictors is non-zero in the population. The Wald statistics and

their significance for all variables except age of mother indicate that all coefficients are significantly different from 0, using a significance level of 0.05. The inability of the variable "age" to attain predictive significance may be because age is a proxy measure for some other variables included in the model.

Table 5.1 Parameter estimates for logistic regression model on variables explaining the probability of still breastfeeding (based on births aged 24 months and below).

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
EDUCATION:			21.1841	2	.0000	.0858	
No Education (Ref)	0.0000						1.0000
Primary	-.2723	.1895	2.0656	1	.1507	-.0053	.7616
Secondary+	-1.0174	.2258	20.2942	1	.0000	-.0885	.3615
RESIDENCE:							
Urban	-.5907	.1745	11.4535	1	.0007	-.0636	.5540
Rural (Ref)	0.0000						1.0000
USE OF CONTRACEPTION:							
Using	-1.0782	.2631	16.7947	1	.0000	-.0796	.3402
Not Using (Ref)	0.0000						1.0000
PLACE OF WORK:			17.4189	2	.0002	.0758	
Not Working (Ref)	0.0000						1.0000
Working at Home	-.1980	.1854	1.1401	1	.2856	.0000	.8204
Working Away	.5530	.1866	8.7829	1	.0030	.0539	1.7384
AGE OF MOTHER:			6.2696	2	.0435	.0312	
15-24	-.2069	.2363	.7667	1	.3812	.0000	.8131
25-34	-.4624	.2051	5.0805	1	.0242	-.0363	.6298
35+ (Ref)	0.0000						1.0000
ASSISTANCE AT DELIVERY:			14.6137	2	.0007	.0674	
Medical Personnel	-.2253	.2037	1.2233	1	.2687	.0000	.7983
TBA (Ref)	0.0000						1.0000
Others or No one	.4871	.1918	6.4491	1	.0111	.0436	1.6276
REGION:			16.6855	3	.0008	.0676	
Southeast	-.7509	.2360	10.1253	1	.0015	-.0590	.4719
Southwest	-.9942	.2569	14.9805	1	.0001	-.0745	.3700
Northwest	-.2448	.2193	1.2461	1	.2643	.0000	.7828
Northeast (Ref)	0.0000						1.0000

Model Chi-Square: 949.811 **Significance:** .0000
Overall Prediction: 90.08%
Number of cases included in the analysis: 2,707

NOTE: Ref -reference category, B -log odds, Wald -Wald statistics, DK -don't know, Sig -significance, Exp(B) -odds, S.E -standard error, df -degree of freedom, R -partial correlation,
Source: NDHS, 1990 Raw data file.

This finding is consistent with the result of a similar study done using DHS data for 25 countries where maternal age was found to be significant in only two of the countries (Sharma and Rutstein, 1991:412). The contribution of individual variables in the model, given by R statistics (Partial correlation), shows that age of mother has the least partial contribution to the model. The log odds (B) of the reference categories of all explanatory variables included in the model are 0.0000 and corresponding odds (Exp(B)) of 1.0000. Exp(B) for other categories are the multiplicative change required to move from one odd to the next.

As expected, maternal education is negatively associated with breastfeeding continuation in the country. Increase in women's educational attainment decreases the odds of still breastfeeding, suggesting a decrease likelihood of still breastfeeding. The odds for primary education suggests that compared to women with no education, primary education reduces the odds of still breastfeeding by a factor 0.76. Similarly, secondary and above education reduces the odds of still breastfeeding by a factor of 0.36 when compared with women with no formal education (reference category). Being an urban resident decreases the odds of still breastfeeding a child that is 24 months or below by a factor of 0.55.

The regression results also indicate that women working away from home compared to those not currently working are more likely to still breastfeed, while women working at home are less likely to be doing so. As earlier explained this unexpected effect of place

of work on any breastfeeding continuation is possibly because a woman working away from home may decide to practise scheduled breastfeeding whereby the child is breastfed shortly before she leaves for work and later in the day when she returns. The child is therefore fed on substitutes while the mother is at work. This can be practised for as long as she wished to continue breastfeeding the child.This finding is consistent with the results obtained in earlier bivariate cross-tabulations. Utilization of modern health care has a negative impact on breastfeeding continuation. Mothers who were assisted at delivery by medical personnel are less likely to continue breastfeeding than those assisted by traditional birth attendants.

Current use of contraception decreases the odds of still breastfeeding, therefore women who were currently using any method of contraception are less likely to be breastfeeding still. Current use of contraception reduces the odds of still breastfeeding by a factor of 0.34 when compared with women not currently breastfeeding (reference category). The odds for region of residence categories indicate that Southern residence reduces the odds of still breastfeeding when compared to North Eastern residence. This reinforces the finding in the last chapter which shows that Northern women are more likely to still be breastfeeding at the time of interview.

As earlier mentioned, the variable "Wants more children" is observed not to have a significant explanatory power in the model. Though contrary to expectation, it may either be that the variable

did not adequately measure the women's intentions to use breastfeeding for contraceptive purposes or that the women did not take breastfeeding to be a reliable contraceptive method (Sharma and Rutstein, 1991:414).

Table 5.2 also presents the parameter estimates for the logistic regression model on variables explaining the probability of still breastfeeding based on births aged 12 months and below.

Table 5.2 Parameter estimates for logistic regression model on variables explaining the probability of still breastfeeding (based on births aged 12 months and below).

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
EDUCATION:			23.4338	2	.0000	.2096	
No Education (Ref)	0.0000						1.0000
Primary	.2010	.5219	.1483	1	.7001	.0000	1.2226
Secondary+	-1.8274	.4754	14.7750	1	.0001	.1699	.1608
PLACE OF WORK:			9.9512	2	.0069	.1160	
Not Working (Ref)	0.0000						1.0000
Working at Home	.1167	.3667	.1013	1	.7503	.0000	.8898
Working Away	1.1712	.4399	7.0878	1	.0078	.1072	3.2259
ASSISTANCE AT DELIVERY:			5.3352	2	.0694	.0549	
Medical Personnel	.5251	.4246	1.5295	1	.2162	.0000	1.6907
TBA (Ref)	0.0000						1.0000
Others or No one	.9387	.4088	5.2722	1	.0217	.0860	2.5567
REGION:			14.6283	3	.0022	.1396	
Southeast	.7398	.7079	1.0922	1	.2960	.0000	2.0955
Southwest	-1.1817	.5873	4.0488	1	.0442	-.0680	.3067
Northwest	-.3656	.4976	.5399	1	.4625	.0000	.6937
Northeast (Ref)	0.0000						1.0000

Model Chi-Square: 95.991 **Significance:** .0000
Overall Prediction: 96.89%
Number of cases included in the analysis: 1,593

NOTE:Ref -reference category, B -log odds, Wald -Wald statistics, DK -don't know, Sig -significance, Exp(B) -odds, S.E -standard error, df -degree of freedom, R -partial correlation,
Source: NDHS, 1990 Raw data file.

With births 12 months and below, fewer number of variables compared to the result earlier obtained in respect of births 24 months and below, attained predictive significance. This is expected since

most women breastfeed beyond 12 months after birth. This finding is supported by the result earlier obtained with respect to breastfeeding at selected ages (section 4.5 in chapter 4), which shows that even at twelve months of age, as high as 89.2 percent of children were still being breastfed. Nevertheless, education, place of work, region of residence and assistance at delivery showed predictive significance. Age of mother is also found to exert insignificant effect on the probability that a woman is still breastfeeding a child 12 months and below. Secondary and above education decreases the odds of still breastfeeding a child that is 12 months and below.

Though place of work variable is significant, it indicates that compared to women not working, working away from home increases the odds of still breastfeeding by a factor of 3.23, suggesting an increased likelihood of still breastfeeding children 12 months and below. The explanations earlier offered in respect of results obtained with the sample of births 24 months and below also apply. Similarly, assistance at delivery attained predictive significance in the model but indicates that women assisted at delivery by medical personnel are more likely to be breastfeeding in the second sample of births. These differences may be due to specific attributes of the health care institutions or to confounding with other attributes of the women likely to be assisted at delivery by medical personnel.

Region of residence effects also indicates that compared to women in the Northeast, Southwest and Northwest mothers are less

likely to still breastfeed their babies 12 months and below, while Southeast residence increased the odds of still breastfeeding.

5.2.2 Correlates of Full Breastfeeding continuation

A model similar to the one on any breastfeeding was fitted using incidence of full breastfeeding as the dependent variable. Child's age and its square were also used as controls. Table 5.3 presents the parameter estimates of the logistic regression model on variables explaining full breastfeeding continuation based on all births 12 months and below. These children can be considered to be on the average six months of age at the time of survey.

The result of the analysis reveals that all variables fitted in the model except age of mother, assistance at delivery and current use of contraception proved to be significant predictors of full breastfeeding continuation. Compared to women with no education, women with secondary and above education are less likely to fully breastfeed their babies aged 12 months and below in the country. Though primary educational level increased the odds of still fully breastfeeding, the value of R-statistics is 0.0000 which indicates that the category has no partial contribution to the model and is also not significant. Urban residence, in contrast to rural living, has strong negative influence on the probability of full breastfeeding in the country as suggested by the reduced odds (0.62) observed for urban women compared to rural women (reference category).

Though place of work variable in an earlier analysis shows an

unexpected impact on any breastfeeding, it shows the expected effect on full breastfeeding practice. It shows a significant explanatory power in the model in addition to indicating that women working away compared to those not working are less likely to still be fully breastfeeding as shown by the decreased odds (0.63) for working away category.

Table 5.3 Parameter estimates for logistic regression model on variables explaining the probability of still fully breastfeeding based on births aged 12 months and below.

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
EDUCATION:			10.1871	2	.0061	.0560	
No Education (Ref)	0.0000						1.0000
Primary	.1287	.1729	.5547	1	.4564	.0000	1.1374
Secondary+	.7230	.2709	7.1201	1	.0076	-.0509	.4853
RESIDENCE:							
Urban	-.4726	.1914	6.0978	1	.0135	-.0456	.6234
Rural (Ref)	0.0000						1.0000
PLACE OF WORK:			11.0408	2	.0040	.0597	
Not Working (Ref)	0.0000						1.0000
Working at Home	-.4438	.1670	7.0629	1	.0079	-.0506	.6416
Working Away	-.4597	.1619	8.0610	1	.0045	-.0554	.6315
WANTS MORE CHILDREN:			5.9539	2	.0509	.0315	
Wants More (Ref)	0.0000						1.0000
No More	.5025	.2113	5.6563	1	.0174	.0430	1.6529
Undecided/Dk	.1646	.1973	.6966	1	.4039	.0000	1.1790
REGION:			28.7599	3	.0000	.1074	
Southeast	-.8823	.2068	18.2070	1	.0000	-.0906	.4138
Southwest	-1.1628	.2585	20.2372	1	.0000	-.0961	.3126
Northwest	-.1453	.1668	.7588	1	.3837	.0000	.8647
Northeast (Ref)	0.0000						1.0000

Model Chi-Square: 485.155 **Significance:** .0000
Overall Prediction: 79.93%
Number of cases included in the analysis: 1,593

NOTE: Ref -reference category, B -log odds, Wald -Wald statistics, DK -don't know, Sig -significance, Exp(B) -odds, S.E -standard error, df -degree of freedom, R -partial correlation,
Source: NDHS, 1990 Raw data file.

Similarly, women working at home compared to those not working are less likely to be fully breastfeeding at the time of the survey. This is expected since full breastfeeding requires mother and child

to be together most of the time, a situation that may be very inconvenient or difficult when a mother works away from home. This finding also reinforces the earlier finding in the last chapter which shows that comparatively lower proportion of women working away from home were still breastfeeding at the time of interview. The analysis also reveals that Southern residence reduces the likelihood of still fully breastfeeding.

The desire for more children variable exerted a significant explanatory power in the model. This is contrary to an earlier observation with respect to any breastfeeding. Women who want no more children or are undecided or don't know are more likely to still be fully breastfeeding compared to their counterparts who want more. It is possible that those who want more children deliberately start supplementation early in readiness for another baby desired.

5.3 INFLUENCE OF SOCIO-DEMOGRAPHIC FACTORS ON REPORTED DURATION OF BREASTFEEDING.

To study the influence of socio-economic and demographic factors on reported durations of any breastfeeding, two demographic variables were selected, namely age of women and duration of postpartum sexual abstinence following the birth, along with six socio-economic variables, namely education, place of residence, region of residence, place of work, husband's occupation and assistance at delivery. The statistical technique used for the analysis is MCA. More information on this method had already been given in chapter 2.

The analysis here is based on reported durations of breastfeeding in the last-closed-birth interval for all ever-married women who had at least two live births in the five years preceding the survey. Retrospectively reported durations as shown under the evaluation of data are subject to a lot of biases. In addition, restriction of analysis to only the last-closed-birth interval has limitations (Page ***et al.***,1982:11-23). The decision to make use of the information in the last closed birth interval is however influenced by the analytical facilities available. An attempt will be made here to examine and describe the correlates of reported duration of breastfeeding using some of the variables already identified in earlier cross-tabulations. With the limitations stated earlier on, there is need to exercise some caution in the interpretation of the results.

5.3.1 Influence of Age and Parity on duration of Breastfeeding

The relationship between maternal age and duration of breastfeeding has been shown to be inconsistent by a number of scholars (Sharma and Rutstein, 1991:410; Smith and Ferry, 1984; Akin ***et al.***,1981; Jain and Bongaarts 1981:86-87; WHO, 1981). If breastfeeding is deliberately used to limit family size, then it is expected that breastfeeding should be affected by the number of children a woman already had (Jain and Bongaarts, 1981:86). To examine this we fitted a multiple regression model using the reported duration of breastfeeding in the last closed birth interval as the dependent variable, while making age and parity as

the independent variables. The model was fitted first for all women and then for women who had never used contraception in the country and in each of the health regions. The summary of regression results is presented in table 5.4.

Table 5.4 Summary of multiple regression analysis using reported duration of breastfeeding in the last closed birth interval as the dependent variable for all women and for women who had never used contraception.

DEMOGRAPHIC CHARACTERISTICS	REGION OF RESIDENCE:				
	NIGERIA	Southeast	Southwest	Northwest	Northeast
FOR ALL WOMEN:					
CORRELATION COEFFICIENT					
Age	.013	.124	.192	-.082	.002
Parity	.018	.098	.185	-.135	.021
PARTIAL REGRESSION COEFFICIENT					
Intercept	16.852	11.825	10.175	20.253	19.058
Age	.000	.094**	.127	.025	.027
Parity	.043	.038	.270	-.345*	.098
R-squared	.000	.016	.041	.019	.001
FOR WOMEN WHO HAD NEVER USED CONTRACEPTION:					
CORRELATION COEFFICIENT					
Age	.004	.125	.189	-.094	.000
Parity	-.008	.096	.136	-.150	.024
PARTIAL REGRESSION COEFFICIENT					
Intercept	17.342	12.240	10.322	20.541	19.153
Age	.017	.096**	.195*	.022	-.027
Parity	-.052	.033	.001	-.370*	.102
R-squared	.000	.016	.036	.023	.001

Note: * significant at 1 percent level
** significant at 5 percent level.
Source: NDHS, 1990 Raw data file.

Table 5.4 shows that there is hardly any correlation between demographic variables, age and parity and the duration of breastfeeding, although some of the partial regression coefficients indicate that the net effects of age and parity are statistically

significant. The value of R^2 indicates that a woman's age and parity explain less than 5 percent of the variation in the duration of breastfeeding in the country and the four regions. The partial regression coefficients indicate that the net effect of mother's age on duration of breastfeeding, among those who have never used contraception, is not statistically significant for the country, Southeast and Northeast regions. In the Northeast the net effect of age is negative as opposed to other regions and even the entire sample. In summary, the net effect of age is small. In the Southwest region for example, about 10 years' increase in mother's age will add about one month to the duration of breastfeeding. Similarly, in the Northwest, 5 years' increase in age adds about one month to the duration of breastfeeding.

The net effect of parity is only significant in the Northwest for women who had never used contraception. While the effect is negative in the Northwest and the total sample, in other regions it is positive. These results are consistent with those obtained by Jain and Bongaarts in their analysis of 8 developing countries using WFS data (Jain and Bongaarts, 1981:87).

The results of the multiple classification analysis on the effects of age and parity on reported duration of breastfeeding after controlling for the effects of other socio-economic factors of education, region and place of residence, place of work and husband's occupation is presented in table 5.5. The analyses of variance for the models are also presented in appendix 5.1 and 5.2.

They show that parity does not have a significant independent effect on duration of breastfeeding in the two models.

Table 5.5 Adjusted and unadjusted deviations from the grand mean obtained by MCA of the effects of age and parity on reported duration of breastfeeding in the last closed birth interval for all women, and for women who had never used contraception after controlling for the effect of other factors.

VARIABLE + CATEGORY	NO OF CASES	UNADJUSTED Dev'n	Eta	ADJUSTED FOR INDEPENDENTS Dev'n	Beta
FOR ALL WOMEN:					
GRAND MEAN: 17.059					
AGE:					
15-19	80	-.75		-1.29	
20-24	482	.39		.18	
25-29	737	.35		-.22	
30-34	641	.31		.26	
35-39	308	.57		.82	
40-44	156	1.18		.97	
45-49	62	.54		-1.02	
			.09		.09
PARITY:					
2-3	930	-.05		.30	
4-6	975	.00		.09	
7+	561	.07		-.66	
			.01		.07
FOR WOMEN WHO HAD NEVER USED CONTRACEPTION:					
GRAND MEAN: 17.629					
AGE:					
15-19	78	-1.00		-1.24	
20-24	416	.47		.18	
25-29	626	-.24		-.28	
30-34	561	.36		-.25	
35-39	258	.54		.94	
40-44	130	1.12		1.14	
45-49	53	-.89		-1.02	
			.09		.10
PARITY:					
2-3	804	.06		.29	
4-6	832	.01		.13	
7+	486	-.12		.72	
			.01		.07

Source: NDHS, 1990 Raw data file.

The magnitude of adjusted deviations which indicate net effects are observed to be very small, with the maximum difference between any two age categories for women who had never used contraception amounting to about two months. The adjusted deviations in respect of the categories of parity also indicate that breastfeeding is virtually not influenced by parity. This finding suggests that breastfeeding is not used deliberately to limit family size in the country (Jain and Bongaarts, 1981:88).

It has been observed that age and parity are highly correlated. Using both simultaneously in a multivariate model could yield unstable regression coefficients. It has therefore been suggested that either of the two can serve as a measure of age-parity differences in breastfeeding duration (Sharma and Rutstein 1991). Consequently, only age is used in subsequent analysis.

5.3.2 Influence of Socio-economic factors on reported duration of breastfeeding

The socio-economic factors included in the model are education, place and region of residence, place of work, use of contraception, husband's occupation and assistance at delivery. Age of mother and duration of postpartum abstinence following the birth are used as covariates. The analysis of variance of the fitted model on the effects of socio-economic factors on duration of breastfeeding is included in appendix 5.3. It shows that the effects of all variables in the model and covariates are statistically significant.

Table 5.6 presents the adjusted and unadjusted effects of the socio-economic factors included in the model. The eta coefficients show region of residence as having the strongest explanatory power. It is followed closely by the educational attainment.

Table 5.6 Adjusted and unadjusted deviations from the grand mean obtained by multiple classification analysis of the effects of socio-economic factors on reported duration of breastfeeding in the last closed birth interval.

GRAND MEAN = 17.091				ADJUSTED FOR INDEPENDENTS + COVARIATES	
VARIABLE + CATEGORY	NUMBER OF CASES	UNADJUSTED Dev'n	Eta	Dev'n	Beta
EDUCATION:					
No Education	1,499	1.51		.60	
Primary	599	-1.90		-.84	
Secondary+	260	-4.30		-1.54	
			.37		.15
RESIDENCE:					
Urban	477	-2.16		-.61	
Rural	1,881	.55		.15	
			.19		.05
HUSBAND'S OCCUPATION:					
Agr.,forest,fish	1,369	1.34		.49	
White collar	383	-2.61		-.65	
Sales and services	606	-1.38		-.69	
			.29		.10
PLACE OF WORK:					
Not working	722	.62		-.25	
Working at home	579	.69		.29	
Working away	1,058	.80		.01	
			.13		.04
USE OF CONTRACEPTION:					
Never used	2,024	.55		.11	
Ever used	334	-3.34		-.65	
			.24		.05
REGION:					
Southeast	742	-2.31		-1.75	
Southwest	420	-1.86		-1.28	
Northwest	632	2.39		1.89	
Northeast	564	1.74		1.14	
			.38		.28
ASSISTANCE AT DELIVERY:					
Medical Personnel	792	-2.23		.18	
TBA	555	.26		.44	
Others or No one	1,011	1.60		.10	
			.30		.04
Multiple R Squared: .337					
Multiple R: .581					

NOTE: Agr., forest, fish agriculture, forestry and fishing.
Source: NDHS, 1990 Raw data file.

Even after controlling for the effects of other predictors included in the model, the strengths of region of residence and education are still evident. This is shown by their corresponding beta values.

Education is associated with shorter durations of breastfeeding. The hypothesis which states that women with higher education breastfeed for longer durations compared to those with lower education is sustained by the results of the MCA. This finding is consistent with the results obtained with the earlier estimation of mean duration of breastfeeding by education and also agrees with the findings from similar studies in some developing countries (Jain and Bongaarts, 1981:88). The adjusted deviations in the table show that the difference in the average duration of breastfeeding between women with no education and those with secondary and above education is about 2 months.

Urban residence is also associated with shorter durations of breastfeeding with the adjusted deviations showing a difference of about 0.7 months. Our hypothesis which states that women in rural areas breastfeed for longer durations than their urban counterparts is also sustained by the finding. This is also in agreement with similar studies elsewhere (Trussell ***et al.***,1992:300-304; Jain and Bongaarts, 1981:88). Contraceptive prevalence in Nigeria is very low. Effect of use of contraception on duration of breastfeeding was however examined by incorporating the variable ever use of contraception into the model. A major limitation with the variable is that it does not strictly refer to the period covered by the

last-closed-birth interval. Nevertheless the result from the analysis shows that ever use of contraception is significantly associated with shorter durations of breastfeeding in the country. Unadjusted effects of the variable show a difference of almost 4 months between those who had ever used and those who had never used. However, after adjusting for the effect of other factors in the model, the effects of contraception was almost removed giving a difference of less than one month between those who had ever used and those who had never used contraception. The average duration of breastfeeding for those who had ever used contraception is however lower than for their counterparts who had never used.

The variable measuring place of work was classified into three categories, namely not working, working at home and working away. The limitation in using this variable is that it refers to place of work as at the time of interview and not at the birth of the child. Unless a woman had been in that particular state for sometime before the survey, it may not effectively capture the effect of place of work on breastfeeding behaviour in the last closed interval. Logically, a woman's place of work is expected to exert some influence on her breastfeeding practice. Just as in the case of education and place of residence, one expects that women who work away from home should also have shorter durations of breastfeeding when compared to those not working. The MCA results show that in the country, women not currently working breastfed least while those working at home have longest duration of breastfeeding. The difference in the adjusted deviations of place

of work categories is less than a month. The result obtained with respect to place of work is likely to have been affected by the limitation already mentioned.

Husband's occupation has three groupings namely agriculture, forestry and fishing, white collar and sales and services. The unadjusted deviations show that the observed differences between women whose husband's are in agricultural-related occupation and those in the other two categories are as high as four months. However, the adjusted deviations are much smaller, showing a difference of about one month. Nevertheless, husband's occupation appears to have a consistent independent effect on women's breastfeeding behaviour. Women whose husbands are in agricultural-related occupations breastfed longer than those whose husbands were in sales and services or white collar occupations.

A number of studies in developing countries have reported associations between the use of modern health care services and breastfeeding. Results have generally been that women who either delivered in hospitals/medical centres or were assisted by health professionals breastfed their children less than their counterparts who delivered at home or were assisted by traditional birth attendants (Anderson ***et al.***,1983; Knodel and Debavalya, 1980; WHO, 1981). Our model included only assistance at delivery variable in order not to give room for redundancy or interactions between variables. The unadjusted deviations shows a difference of about 4 months between women who were assisted at delivery by medical personnel and those assisted by others or no one. After adjusting

for the effect of other factors in the model women assisted at delivery by medical personnel have lower average duration of breastfeeding, while those assisted by TBA breastfed longest in the country. The difference is however less than one month.

Region of residence variable shows the greatest effect on reported duration of breastfeeding. The unadjusted deviations indicate a difference of about 5 months. After adjusting for the effects of other factors included in the model the difference reduced to about 3.5 months. The results are also consistent with the earlier results which show that Northern mothers breastfed longer than their Southern counterparts.

5.3.3 Multiple regression analysis on the effects of socio-demographic factors on reported duration of breastfeeding.

The effects of socio-demographic factors on the duration of breastfeeding are summarized in Table 5.7. The effects are obtained by using multiple regression analysis which is based on a simple additive model with no interaction terms. Two multiple regression models were fitted: one for all women and the other for women who had never used contraception. Mother age is included as a continuous variable of single years. Other variables were introduced as dummy variables. (Education is assigned value 0 for no education and 1 for some education, survival status was assigned value 0 for dead children and 1 for living children. Living in the urban areas is assigned a value one, and living in rural areas is assigned the value zero. The male child takes the value of one and the female takes the value zero. Work status take the value 1 for

currently working and 0 for not working. Women who never breastfed their child were assigned the value zero for duration of breastfeeding).

Table 5.7 Summary of multiple regression analysis using the reported duration of breastfeeding (months) in the last closed birth interval as the dependent variable for all women and for women who had never used contraceptive.

INDEPENDENT VARIABLES	REGION OF RESIDENCE:				
	Southeast	Southwest	Northwest	Northeast	Nigeria
PARTIAL REGRESSION COEFFICIENT					
I. ALL WOMEN					
Intercept	8.22	7.45	10.51	12.21	11.29
Age	.032	.084	-.048	.016	-.016
Infant Death	6.444*	9.260*	10.386*	6.572*	8.011*
Education	-1.737*	-3.563*	-1.298*	-2.758*	-3.682*
Residence	-1.702*	-3.285*	-2.149***	-.825	-1.908*
Sex of child	-.081	.781	-.364	-.397	-.176
Work Status	.575	-.146	1.189*	-.054	.115
R2	.170	.312	.391	.152	.251
II. WOMEN WHO HAD NEVER USED CONTRACEPTION					
Intercept	8.23	5.30	10.71	12.14	11.10
Age	.043	.109	-.055	.021	-.013
Infant Death	6.549*	10.275*	10.340*	6.605*	8.175*
Education	-1.582*	-2.461*	-.831	-2.703*	-3.227*
Residence	-1.780***	-2.989*	-2.181*	-1.019	-1.696*
Sex of Child	-.342	1.223	-.305	-.205	-.120
Work Status	.411	-.240	1.248**	-.040	.094
R2	.171	.311	.385	.152	.241

NOTE: * Significant at p< .001, ** significant at p< .01
*** significant at p< .05
Source: NDHS, 1990 Raw data file.

The percentage of variations in the duration of breastfeeding explained by the predictors is about 24 percent. This percentage of explained variation also ranges between 15 percent in the Northeast and 39 percent in the Northwest. The table shows that education, place of residence and survival status as having consistent significant effects on duration of breastfeeding in the last-

closed-birth interval. Age of mother did not attain predictive significance in all the samples.

In the total sample and all the regions, the duration of breastfeeding is shortened by the death of a child. This is shown by the positive partial regression coefficient, which indicates that living children are breastfed longer than dead children. The negative partial regression coefficient for education and residence also indicates that women with some education or those who live in urban areas breastfed their children for shorter durations than others.

The table also shows that sex of child exerted no significant effect on duration of breastfeeding in the last closed birth interval. The partial regression coefficients for sex of child variable indicate that the differences in breastfeeding between male and female children are less than one month in the country and all regions except Northwest and are not statistically significant. Our hypothesis which states that male children are more likely to be breastfed longer than female children is therefore not sustained. Whether or not a mother is currently working does not show a significant effect on duration of breastfeeding except only in the Northwest region sample.

5.4 EFFECTS OF SOCIO-DEMOGRAPHIC FACTORS ON FREQUENCY OF BREASTFEEDING

The effects of socio-demographic factors on frequency of breastfeeding was examined for women still breastfeeding their last child as at the time of interview using multiple classification

analysis. Predictors included in the analysis were education, place and region of residence, occupation. Age of child and age of mother were used as covariates. The analysis of variance for the model is included in appendix 5.4. It shows that all variables included in the model attained predictive significance except the place of residence. Table 5.8 presents the unadjusted and adjusted effects of selected predictors on the daily frequency of breastfeeding

The beta values for the predictors show region of residence as exerting the strongest effect on frequency of breastfeeding. It is closely followed by education and bottle-feeding practice. The effect of place of residence however vanished after controlling for the other predictors included in the model as indicated by its beta value.

The table shows that after controlling for the effects of other factors included in the model, Southern mothers breastfed more frequently than their Northern counterparts. Southwest region has the highest frequency while Northwest has the lowest frequency. The table also shows that frequency of breastfeeding is negatively associated with the mother's level of education even after controlling for the effects of other factors included in the model. Bottle feeding is associated with lower frequency of breastfeeding. The adjusted effects of occupation indicates that women in white collar jobs are more likely to breastfeed less frequently compared to women in other occupational groups.

Table 5.8 Unadjusted and adjusted effects of selected factors on frequency of breastfeeding in the last 24 hours preceding the survey.

GRAND MEAN = 12.28				ADJUSTED FOR INDEPENDENTS + COVARIATES	
VARIABLE + CATEGORY	NUMBER OF CASES	UNADJUSTED Dev'n	Eta	Dev'n	Beta
REGION:*					
Southeast	700	1.08		1.35	
Southwest	412	.48		1.44	
Northwest	601	-1.65		-2.19	
Northeast	651	.06		-.34	
			.16		.23
EDUCATION:*					
No Education	1491	.09		.46	
Primary	605	.37		-.25	
Secondary+	268	-1.33		-1.97	
			.08		.12
RESIDENCE:					
Urban	429	-.40		-.02	
Rural	1936	.09		.00	
			.03		.00
BOTTLE FEEDING:*					
Yes	524	-.98		-1.38	
No	1841	.28		.39	
			.08		.12
OCCUPATION:***					
Not working	880	-.59		-.33	
Agric-related	827	.87		.49	
White collar	260	-.64		-.49	
Sales & Services	398	-.08		.02	
			.10		.06
Multiple R Squared:	.061				
Multiple R:	.247				

* Significant at p <.00001, *** Significant at p <.05
Source: NDHS, 1990 Raw data file.

The model was separately fitted using the number of daylight and nighttime feedings as dependent variables. The analysis of variance for the effects of socio-demographic factors on nighttime and daylight feedings are also included in the appendix 5.5 and 5.6. Tables 5.9 and 5.10 present the unadjusted and adjusted

effects of socio-demographic factors on frequency of nighttime and daylight feedings.

Table 5.9 Unadjusted and adjusted effects of selected factors on frequency of nighttime feedings in the last 24 hours preceding the survey.

GRAND MEAN = 5.15				ADJUSTED FOR INDEPENDENTS + COVARIATES	
VARIABLE + CATEGORY	NUMBER OF CASES	UNADJUSTED Dev'n	Eta	Dev'n	Beta
REGION:*					
Southeast	700	.98		1.10	
Southwest	412	.29		.59	
Northwest	601	-1.29		-1.49	
Northeast	651	-.04		-.18	
			.24		.28
EDUCATION:*					
No Education	1491	-.11		.13	
Primary	605	.39		-.03	
Secondary+	268	-.26		-.67	
			.07		.07
RESIDENCE:					
Urban	429	-.02		.24	
Rural	1936	.01		-.05	
			.00		.03
BOTTLE FEEDING:*					
Yes	524	-.45		-.76	
No	1841	.13		.22	
			.07		.11
OCCUPATION:					
Not working	880	-.40		-.16	
Agric-related	827	.41		.23	
White collar	260	.10		.03	
Sales & Services	398	-.03		-.13	
			.10		.05
Multiple R Squared:	.079				
Multiple R:	.282				

* Significant at p <.00001.
Source: NDHS, 1990 Raw data file.

The adjusted deviations for the regions still show that Southern women breastfeed more frequently at night than their Northern counterparts. Frequency of nighttime feedings is observed

to be negatively associated with level of education and bottle feeding is associated with lower frequency of nighttime feedings.

Table 5.10 Unadjusted and adjusted effects of selected factors on frequency of daylight feedings in the last 24 hours preceding the survey.

GRAND MEAN = 7.13				**ADJUSTED FOR INDEPENDENTS + COVARIATES**	
VARIABLE + CATEGORY	**NUMBER OF CASES**	**UNADJUSTED** Dev'n	Eta	Dev'n	Beta
REGION:					
Southeast	700	.10		.25	
Southwest	412	.19		.85	
Northwest	601	-.36		-.70	
Northeast	651	.10		-.16	
			.05		.13
EDUCATION:*					
No Education	1491	.20		.32	
Primary	605	.02		-.22	
Secondary+	268	-1.07		-1.30	
			.10		.13
RESIDENCE:***					
Urban	429	-.38		.26	
Rural	1936	.08		.06	
			.05		.03
BOTTLE FEEDING:*					
Yes	524	-.53		-.63	
No	1841	.15		.18	
			.07		.09
OCCUPATION:***					
Not working	880	.19		-.16	
Agric-related	827	.46		.27	
White collar	260	-.74		.52	
Sales & Services	398	-.04		.15	
			.10		.07
Multiple R Squared:	.041				
Multiple R:	.203				

* Significant at p <.00001, *** Significant at p <.05
Source: NDHS, 1990 Raw data file.

Residence and Occupation however did not attain predictive significance. Similarly, for daylight feedings, education, bottle feeding, occupation and place of residence attained predictive

significance. The deviations also indicate the negative association of education with the frequency of daylight feedings, the lower frequency of daylight feedings with women using feeding bottles and the reduced frequency for women in white collar occupations.

5.5 EFFECTS OF SOCIO-DEMOGRAPHIC FACTORS ON USE OF FEEDING BOTTLES.

In order to evaluate the individual effect of some selected background variables on use of feeding bottles while controlling for the effects of other predictors, logistic regression analysis on the probability of using feeding bottles was carried out. The analysis was done using two samples of births just like in the case of any breastfeeding. Age of child and its square were used as controls in the models. The models were fitted with a full set of predictors which includes education, place and region of residence, age of mother, place of work and assistance at delivery. Table 5.11 presents the parameter estimates for the logistic regression model on variables explaining the probability of using feeding bottles based on all births aged 24 months and below. All fitted variables except age of mother exerted significant effects on the probability of using feeding bottles with the first sample for the entire country.

Higher education, assistance at delivery by medical personnel and urban residence are significantly associated with higher likelihood of using feeding bottles. This finding is consistent with a constellation of factors identified in the last chapter to be associated with use of feeding bottles.

Table 5.11 Parameter estimates for logistic regression model on variables explaining the probability of using feeding bottles with nipples based on births aged 24 months and below.

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
EDUCATION:			44.9250	2	.0000	.1181	
No Education (Ref)	0.0000						1.0000
Primary	.8004	.1308	37.4233	1	.0000	.1099	2.2264
Secondary+	.8728	.1590	30.1255	1	.0000	.0979	2.3935
RESIDENCE:							
Urban	.4925	.1310	14.1310	1	.0002	.0643	1.6364
Rural (Ref)	0.0000						1.0000
PLACE OF WORK:			10.2391	2	.0060	.0461	
Not Working (Ref)	0.0000						1.0000
Working at Home	-.4598	.1511	9.2599	1	.0023	-.0498	.6314
Working Away	-.2955	.1282	5.3105	1	.0212	-.0336	.7442
ASSISTANCE AT DELIVERY:			17.7415	2	.0001	.0684	
Medical Personnel	.6219	.1516	16.8313	1	.0000	.0711	1.8625
TBA (Ref)	0.0000						1.0000
Others or No one	.2688	.1550	3.0078	1	.0829	.0185	1.3084
REGION:			62.1643	3	.0000	.1384	
Southeast	.6997	.1782	15.4214	1	.0001	.0676	2.0132
Southwest	1.2516	.1893	43.7012	1	.0000	.1192	3.4958
Northwest	-.0642	.1823	.1239	1	.7249	.0000	.9379
Northeast (Ref)	0.0000						1.0000

Number of cases included in the analysis: 2,813
Overall Prediction: 82.58%
Model Chi-Square: 562.503 **Significance:** .0000

NOTE:Ref -reference category, B -log odds, Exp(B) -odds, S.E -standard error, df -degree of freedom, Sig -significance, R -partial correlation, Wald -Wald statistics.
Source: NDHS, 1990 Raw data file.

The findings also reflect the variability among classes of women and groups. For instance, women with less education, residing in the rural areas and assisted at delivery by TBA may still be traditional in their behaviour and perceptions regarding breastfeeding or use of feeding bottles (Castle et al.,1988). The place of work effects however indicate that women who currently work away from home are less likely to be using feeding bottles compared with women not working. Similarly, women who work at home

are also less likely to be using feeding bottles compared to their counterparts not working.

Southern regional residence increased the odds of using feeding bottles by a factor of between 2 to 3.5, that is, women residing in the Southern regions are more likely to be using feeding bottles when compared to North Eastern women. This is quite consistent with the results of the earlier bivariate cross-tabulations shown in the previous chapter.

Table 5.12 also presents the parameter estimates for the logistic regression model on variables explaining the probability of using feeding bottles with nipples based on births aged 12 months and below. All variables except age of mothers attained predictive significance with the parameter estimates showing a similar pattern as earlier observed with births 24 months and below.

Urban residence increased the odds of using feeding bottles to feed children aged 12 months and below by a factor of 2, compared to rural residence. As earlier observed with the first sample of births, women with primary or secondary and above education are two times more likely to use feeding bottles compared to women with no formal education. The place of work variable effect shows that, compared to women who were not currently working, women working away from home or working at home are less likely to use feeding bottles. This is consistent with the results of earlier cross-tabulations.

Table 5.12 Parameter estimates for logistic regression model on variables explaining the probability of using feeding bottles with nipples based on births aged 12 months and below.

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
EDUCATION:			33.0161	2	.0000	.1213	
No Education (Ref)	0.0000						1.0000
Primary	.8649	.1582	29.9063	1	.0000	.1189	2.3748
Secondary+	.8275	.1973	17.5824	1	.0000	.0889	2.2875
RESIDENCE:							
Urban	7181	.1603	20.0755	1	.0000	.0957	2.0505
Rural (Ref)	0.0000						1.0000
PLACE OF WORK:			9.9656	2	.0069	.0550	
Not Working (Ref)	0.0000						1.0000
Working at Home	-.5594	.1861	9.0387	1	.0026	-.0597	.5716
Working Away	-.3493	.1564	4.9872	1	.0255	-.0389	.7052
ASSISTANCE AT DELIVERY:			26.0953	2	.0000	.1058	
Medical Personnel	.9326	.1835	25.8435	1	.0000	.1099	2.5411
TBA (Ref)	0.0000						1.0000
Others or No one	.5125	.1879	7.4386	1	.0064	.0525	1.6695
REGION:			65.1325	3	.0000	.1731	
Southeast	.7932	.2149	13.6165	1	.0002	.0767	2.2104
Southwest	1.5903	.2305	47.6191	1	.0000	.1520	4.9054
Northwest	.0134	.2173	.0038	1	.9509	.0000	1.0135
Northeast (Ref)	0.0000						1.0000

Number of cases included in the analysis: 1,343
Overall Prediction: 78.63%
Model Chi-Square: 421.578 **Significance**: .0000

NOTE: Ref -reference category B -log odds, Exp(B) -odds, S.E -standard error, df -degree of freedom, Sig -significance, R -partial correlation, Wald -Wald statistics.
Source: NDHS, Raw 1990 data file.

Use of modern health care facilities which is measured by assistance at delivery indicates that women assisted at delivery by medical personnel (increase odds by a factor of 2.5) are more likely to be using feeding bottles compared to those assisted by traditional birth attendants. Southern region residence, as observed with the first sample of births, increased the odds of using feeding bottles. Southwest region residence particularly increased the odds of using feeding bottles by a factor of 4.9 when compared with Northeast region (reference category).

5.6 EFFECTS OF SOCIO-DEMOGRAPHIC FACTORS ON AGE AT GIVING SUPPLEMENTATION.

Multivariate analysis to identify correlates of age at given supplements was performed using multiple classification analysis techniques. Like in the case of duration of breastfeeding analysis, it is restricted to the last-closed-birth interval for each woman that had at least two births in the five years preceding the survey. Two separate models were fitted on age at given formula or milk and solid/mushy foods.

5.6.1 Age at given formula or milk.

The fitted model used age at given formula or milk as the dependent variable. The predictors include education, region and current place of residence, place of work and assistance at delivery. Age of mother and duration of postpartum sexual abstinence following each birth were used as covariates. The analysis of variance result for the model is included in appendix 5.7. All the selected predictors except level of education have highly significant independent effects on the age at given formula or milk.

Table 5.13 presents the results of the MCA of the effects of the selected predictors on age at given formula or milk in the last closed interval for women aged 15-49 years. It reveals that Northwest women gave formula or milk latest, while Southwest mothers gave formula or milk earliest, after the effects of other factors included in the model are controlled.

Table 5.13 Unadjusted and adjusted effects of selected socio-demographic factors on age at given formula or milk in the last closed birth interval.

GRAND MEAN = 2.046					
		UNADJUSTED		**ADJUSTED FOR INDEPENDENTS + COVARIATES**	
VARIABLE + CATEGORY	**N**	Dev'n	Eta	Dev'n	Beta
REGION:*					
Southeast	419	.18		.25	
Southwest	381	-1.08		.92	
Northwest	188	1.45		1.35	
Northeast	217	.30		-.04	
			.34		.30
EDUCATION:					
No Education	577	.46		.03	
Primary	390	-.30		-.05	
Secondary+	238	-.62		.01	
			.18		.01
RESIDENCE:*					
Urban	366	.82		-.34	
Rural	839	.36		.15	
			.21		.09
PLACE OF WORK:*					
Not Working	326	.76		.48	
Working at home	263	-.32		.44	
Working away	615	-.27		.06	
			.18		.13
ASSISTANCE AT DELIVERY:**					
Medical Personnel	611	-.40		-.09	
TBA	254	-.11		.31	
Others or No one	340	.79		.40	
			.20		.10
Multiple R Squared:	.168				
Multiple R:	.409				

NOTE: * significant at p <.0000, ** significant at p <.001
Source: NDHS, 1990 Raw data file.

Urban residents gave formula or milk earlier than their rural counterparts. Work status effect shows that women not working introduced formula or milk almost a month later than their counterparts who were working at home. Women assisted by traditional birth attendants also gave formula or milk slightly

earlier than those assisted by medical personnel. Those assisted by others or no one introduced formula or milk about half a month later. The fitted model explained about 16.8 percent of the variations.

5.6.2 Age at given solid/mushy foods

Multiple Classification Analysis on the effects of selected socio-demographic factors on age at given solid/mushy foods was examined using education, place of work, region and current place of residence as predictor variables. Age of mother and duration of postpartum sexual abstinence were used as covariates. The analysis of variance for the model is included in appendix 5.8. All the predictors except place of residence have significant independent effects on age at given solid/mushy foods. Table 5.14 presents the unadjusted and adjusted effects of selected socio-demographic factors on age at given solid/mushy foods.

Region of residence exerted the most dominant effect before and after adjusting for the effect of other factors. Women residing in the Southwest region gave solid/mushy foods later compared to the other regions. Even after controlling for the effect of other factors the pattern remains virtually unchanged. The effect of education indicates, though very small, that women with primary education gave solid/mushy foods earlier than their counterparts with no formal education or with secondary and above education. Women working away from home gave solid/mushy food about one month earlier than those not working or working at home.

Table 5.14 Unadjusted and adjusted effects of selected socio-demographic factors on age at given solid/mushy foods in the last closed birth interval.

GRAND MEAN = 2.046				ADJUSTED FOR INDEPENDENTS + COVARIATES	
		UNADJUSTED			
VARIABLE + CATEGORY	N	Dev'n	Eta	Dev'n	Beta
REGION:*					
Southeast	751	-.93		-.54	
Southwest	440	1.47		1.63	
Northwest	665	-.15		-.34	
Northeast	578	.26		.15	
			.26		.25
EDUCATION:**					
No Education	1542	.05		.10	
Primary	619	-.26		.29	
Secondary+	272	.32		.09	
			.05		.05
RESIDENCE:					
Urban	495	.60		.05	
Rural	1937	.15		.01	
			.10		.01
PLACE OF WORK:*					
Not Working	735	.38		.53	
Working at home	602	.50		.52	
Working away	1095	.52		-.64	
			.15		.18
Multiple R Squared:	.109				
Multiple R:	.330				

NOTE: * significant at p <.0000, *** significant at p <.05
Source: NDHS, 1990 Raw data file.

5.7 SUMMARY

Logistic regression analysis of current status on any breastfeeding shows a range of influences associated with breastfeeding continuation. The pattern of effect and significance of factors vary considerably. The factors that show prominence in their explanatory power in the country include region, education, place of residence, place of work, age of mother, contraceptive use and assistance at delivery. Maternal education has significant

negative impact on any breastfeeding continuation while urban residence is negatively associated with any breastfeeding continuation. Contraceptive use significantly reduces the chances of continuing breastfeeding. Place of maternal work effect on any breastfeeding continuation shows that comparatively women who work away from home have a higher chance of breastfeeding continuation than those not working. Women working at home are less likely to continue breastfeeding than those not working.

The analysis also revealed that women who received assistance at delivery from medical personnel have reduced chance of continuing breastfeeding than those assisted by traditional birth attendants. Northern mothers are more likely to be breastfeeding compared to their Southern counterparts.

When the same model was applied on the sample of births aged 12 months and below, many of the variables could not attain predictive significance. Nevertheless, education, region of residence, mother's place of work, contraception and assistance at delivery still show significant impact.

The analysis of full breastfeeding continuation showed education, region and place of residence, place of work, wants more children as statistically significant correlates. Northern mothers are more likely to fully breastfeed compared to their Southern counterparts. Maternal education and place of work have the expected negative impact on full breastfeeding continuation. The place of work relationship supports the earlier comment as to the need for the mother and child to be close to make full

breastfeeding easy. Women working away from home have reduced chance of continuing full breastfeeding compared to those not working or those working at home.

Analysis of correlates of reported breastfeeding duration showed that women's education, region and place of residence, husband's occupation, assistance at delivery, place of work and use of contraception as the correlates of breastfeeding. The pattern of effects indicates that women with higher education, or those residing in urban areas breastfed their children for shorter durations compared to those who have lower education or who live in rural areas. Age of mother showed no consistent result on reported duration of breastfeeding.

Women whose husbands are in agricultural-related occupations breastfed for longer duration than wives of men in white collar and sales and services occupations. Use of modern health care facilities showed negative influence on breastfeeding. Women assisted at delivery by medical personnel breastfed for shorter durations than those assisted by TBAs.

Logistic regression on use of feeding bottles revealed that education, region and place of residence, place of work and assistance at delivery are all significant predictors that affect the chance of using feeding bottles.

Examining the factors affecting the age at introduction of supplements, our results show education, region and place of residence, work status and assistance at delivery as important explanatory variables.

CHAPTER VI

THE IMPACT OF BREASTFEEDING ON FERTILITY

6.1 INTRODUCTION

The effect of breastfeeding practice on the chance of conception is well documented in the literature. Because of the link that exists between breastfeeding and fertility, any substantial shortening of the average duration of breastfeeding will lead to higher fertility unless contraceptive use increases fast enough to counteract the effect. In societies where contraceptive use is low or non-existent long periods of breastfeeding may be the sole control exercised on the level of fertility. Evidence from many studies indicate that shorter breastfeeding durations mean shorter birth intervals between births and thus a large completed family size (Jain and Bongaarts, 1981:96-98; Chen *et al.*,1974; Cantrelle and Leridon, 1971). Breastfeeding effects on birth interval operate primarily by delaying the resumption of ovulation after birth.

The evaluation of the impact of breastfeeding on fertility is complex. This is because of the problem of reciprocal causality. Breastfeeding practice influences the time that will elapse before a woman becomes susceptible again to conception. On the other hand, the advent of a new pregnancy also influences breastfeeding because many women wean their babies completely only when they become pregnant again (Page *et al.*,1982:49). In this section, an attempt is made to examine the effect of breastfeeding on postpartum variables of amenorrhea, abstinence and contraception and also to

assess the protection from pregnancy offered by lactational amenorrhea. Bongaarts model is also employed to evaluate the relative importance of proximate variables with special reference to postpartum infecundability, amenorrhea and abstinence on the level of fertility.

6.2 BREASTFEEDING AND POSTPARTUM AMENORRHEA

Postpartum amenorrhea which is the time lag between the termination of pregnancy and resumption of ovulation and consequently menstruation is a period during which most women are infecund. Its duration, therefore, has a direct bearing on fertility. Many studies have reported an association between supplementation of the child's diet and shortened durations of postpartum amenorrhea (Prema and Ravindranath, 1982; Chen *et al.*,1974). Table 6.1 presents the prevalence/incidence mean duration of postpartum amenorrhea by selected background characteristics controlling for the age of mother at birth. The mean duration of postpartum amenorrhea for the total sample is 17.3 months. The age pattern of amenorrhea suggests that older women have longer mean duration. This could be explained by the possibility of decreasing fecundity with increasing age in addition to related physiological changes in reproductive organs as well as other biological factors such as nutritional and health status of women. Noteworthy, however, is the positive association between postpartum amenorrhea and duration of breastfeeding, already documented by many studies (Lee, 1988).

Table 6.1 Prevalence/Incidence mean duration of Amenorrhea (in months) according to age of mother at birth and selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER:			ALL WOMEN	TOTAL BIRTHS*
	<25	25-34	35-49		
NIGERIA	15.3	17.6	22.6	17.3	9,157
REGION:					
Southeast	11.9	14.4	17.0	13.8	2,719
Southwest	13.0	14.9	19.2	15.3	1,683
Northwest	17.7	21.1	33.1	20.7	2,568
Northeast	16.4	21.5	24.2	19.2	2,187
RESIDENCE:					
Urban	11.1	15.0	17.7	13.8	1,911
Rural	16.3	18.6	23.7	18.2	7,245
EDUCATION:					
No Education	17.4	19.0	24.4	19.3	5,828
Primary	13.6	17.0	16.0	15.2	2,269
Secondary+	11.8	12.1	(10.8)	11.9	1,059
SEX OF CHILD:					
Boy	15.4	18.4	22.3	17.5	4,562
Girl	15.2	16.9	22.8	17.0	4,595
PLACE OF WORK:					
Not working	16.4	21.6	25.2	19.0	2,864
Working at home	15.0	18.3	20.0	17.3	2,232
Working Away	14.3	15.2	23.0	16.0	3,986
ASSISTANCE AT DELIVERY:					
Med. Personnel	12.1	13.8	15.2	13.3	2,959
TBA	14.3	21.9	19.0	17.8	2,110
Others or No one	18.0	18.8	29.7	19.9	3,969

NOTE: Med. -medical, ( ) based on less than 10 cases.
* -totals for some characteristics are less than the overall sample because of missing values.
Source: NDHS, 1990 Raw data file.

It is therefore not surprising that older women earlier observed to have longer duration of breastfeeding also experience longer duration of amenorrhea. In other words, the pattern of differential earlier on observed with respect to mean duration of breastfeeding is more or less replicated by pattern of amenorrhea. An important feature of the amenorrhea pattern is that there appears to be

stronger relationship between duration of full breastfeeding and amenorrhea compared to any breastfeeding.

Mean duration of amenorrhea is lowest in the Southeast (13.8 months) and highest in the Northwest (20.7 months). The North/South differential indicates longer mean duration of amenorrhea in the North compared to the South, a situation quite consistent with earlier estimates of mean durations of any and full breastfeeding which are also longer in the Northern regions. Rural women have longer duration of amenorrhea than their urban counterparts. Duration of amenorrhea is negatively associated with the level of education. This is expected since urban or more educated women have been found to have shorter mean duration of breastfeeding. The proportion of women feeding on schedule rather than on demand are also more likely to be higher for urban and the more educated than for their rural and uneducated counterparts respectively. This may have influenced the return of fertility of these women (McCann *et al.*,1981:533,542-543). Women who work away from home have shorter duration of amenorrhea (16.0 months) compared to those not working (19.3 months) or those working at home (17.3 months). As earlier observed, women working away from home are more likely to experience conflict between work and breastfeeding. This possibly could have made them stop breastfeeding very early or increase the level of supplementation while still breastfeeding, resulting in reduced frequency of suckling and consequently in early resumption of menstruation. Studies have documented that women who breastfeed

less frequently stand the risk of early return of fertility (Rutstein, 1991:900-901; Lee, 1988:209).

Women assisted at delivery by medical personnel have shorter duration of amenorrhea compared to their counterparts assisted by TBA or others or no one. This is expected considering the fact that women assisted at delivery by medical personnel have also been found to have shorter mean duration of breastfeeding compared to their counterparts assisted at delivery by TBA.

Many studies have demonstrated that populations with longer duration of breastfeeding have longer durations of postpartum amenorrhea (Tawiah, 1994:241; Rutstein, 1991; Lee, 1988; Bongaarts and Potter, 1983; Jain and Bongaarts, 1981; Ferry, 1981:9: Saxena, 1977:45-51). Since the fertility impact of breastfeeding operates mainly through amenorrhea, there is the need to examine the relationship between breastfeeding and amenorrhea in the present study. Table 6.2 presents the mean duration of full and any breastfeeding and postpartum amenorrhea by some selected background characteristics of respondents.The strong positive association between durations of breastfeeding and amenorrhea is evident from the table. For example the Northern regions with longer mean duration of full and any breastfeeding correspondingly have longer mean duration of amenorrhea. Similar pattern is observed in respect of other background characteristics.

Table 6.2 Prevalence/Incidence mean durations of full and any breastfeeding and postpartum amenorrhea (in months) by some selected background characteristics.

SELECTED CHARACTERISTICS	MEAN DURATION (IN MONTHS):			
	Any B/feeding	Full B/feeding	Postpartum Amenorrhea	TOTAL BIRTHS*
NIGERIA	20.4	4.0	17.3	9,157
REGION:				
Southeast	18.3	3.0	13.8	2,719
Southwest	17.8	2.0	15.3	1,683
Northwest	23.6	5.3	20.7	2,568
Northeast	21.5	5.3	19.2	2,187
RESIDENCE:				
Urban	16.4	2.5	13.8	1,911
Rural	21.4	4.4	18.2	7,245
EDUCATION:				
No Education	21.7	4.6	19.3	5,828
Primary	19.3	3.8	15.2	2,269
Secondary+	16.5	1.6	11.9	1,059
AGE OF WOMEN:				
15-24	18.5	3.3	15.3	2,347
25-34	21.1	4.7	17.6	4,728
35+	24.3	4.2	22.6	2,082
SEX OF CHILD:				
Boy	20.8	4.4	17.5	4,562
Girl	20.0	3.6	17.0	4,595
PLACE OF WORK:				
Not working	21.6	5.8	19.0	2,864
Working at home	18.7	3.5	17.3	2,232
Working away	20.7	2.9	16.0	3,986
ASSISTANCE AT DELIVERY:				
Med. Personnel	17.6	2.8	13.3	2,959
TBA	19.5	4.3	17.8	2,110
Others/No One	23.0	4.7	19.9	3,969

NOTE: Med.-medical, * -totals for some characteristics are less than the overall sample because of missing values.
Source: NDHS, 1990 Raw data file.

Even with the analysis restricted to women who had already weaned their children at the time of the survey, that is, in the last closed birth interval, mean duration of amenorrhea was estimated for each of the known breastfeeding durations. Table 6.3 presents the mean duration of amenorrhea by known durations of breastfeeding

in the last closed interval according to place of residence. The table also revealed in unmistakable terms the pattern of positive relationship between breastfeeding and amenorrhea: women who breastfed longer had longer duration of amenorrhea.

Table 6.3 Mean duration of amenorrhea in the last closed birth interval according to place of residence by reported duration of breastfeeding.

Duration of Breastfeeding (months)	DURATION OF AMENORRHEA (MONTHS): PLACE OF RESIDENCE: Urban	Rural	ALL WOMEN	NUMBER OF WOMEN
0	1.0	4.5	3.1	4
1	3.0	9.7	8.4	8
2	2.6	11.2	9.4	11
3	2.2	6.5	4.2	11
4-5	5.8	8.4	7.5	23
6	5.1	5.3	5.2	24
7-8	6.2	7.3	6.9	61
9-11	6.7	7.2	7.0	132
12	8.7	8.6	8.6	352
13-17	8.9	9.3	9.2	528
18	11.2	12.2	11.9	451
19-23	14.2	12.4	12.8	336
24	15.4	13.7	13.9	381
25-29		15.5	15.4	61
30-36	9.4	18.1	17.9	18
All	9.8	11.1	10.8	2,401

Source: NDHS, 1990 Raw data file.

It is also interesting to note that for a given duration of breastfeeding the durations of amenorrhea vary widely according to the categories of place of residence. This is probably due to differences in the type of breastfeeding practices engaged in by different mothers. It has been widely hypothesized and studies have even shown that the link between breastfeeding and postpartum amenorrhea is the frequency and intensity of breastfeeding (Lee,

1988:209; WHO, 1981; McCann *et al.*,1981:533). Some studies have even suggested that during the first six months of unsupplemented breastfeeding, stimulus produced by the suckling process is sufficient to postpone recovery of fertility (Kennedy, 1990). If indeed the frequency of breastfeeding plays some role in determining the duration of amenorrhea, it follows that a higher proportion of women should remain amenorrheic among women with higher frequency of breastfeeding.

Women still breastfeeding their last child were divided into two groups: those breastfeeding six times or less per day and those breastfeeding seven times or more per day. The proportion of women still amenorrheic was estimated for the two categories and for different durations postpartum. Table 6.4 presents the percentage of currently breastfeeding women still amenorrheic according to frequency of breastfeeding for various durations postpartum.

Table 6.4 Percentage of currently breastfeeding women remaining amenorrheic according to frequency of breastfeeding per day and various durations postpartum.

DURATION POSTPARTUM	DAILY FREQUENCY OF BREASTFEEDING: 0-6 times	7 or more times	All	NO OF WOMEN
0 1	93.6	94.5	94.4	234
2 - 3	89.7	92.8	92.5	238
4 - 5	88.0	88.1	88.1	246
6 9	70.9	79.3	78.5	566
10-13	62.2	70.3	68.9	419
14-18	60.0	61.9	61.6	418
19-24	42.2	57.0	56.9	176
All	67.5	76.9	76.2	2,297

Source: NDHS, 1990 Raw data file.

At the same time postpartum women who breastfeed 0-6 times per day are less likely to be amenorrheic than women breastfeeding 7 times and more per day. This lends support to the theory that frequency of nipple stimulation is a major factor in delaying the onset of postpartum ovulation (Lee, 1988:211; McCann *et al.*,1981:526). It is however noteworthy that while intensive suckling may extend the postpartum infecundity, it apparently does not do so indefinitely. Whatever the frequency of suckling fecundity returns gradually with time (McCann *et al.*,1981:542).

The pattern of supplementation also appears to affect the onset of menses. The more a child receives supplementation, the less the frequency and intensity of breastfeeding. Three patterns of breastfeeding/supplementation identified in this regard are: not breastfeeding, fully breastfeeding, breastfeeding with food and milk supplements. The proportion of women remaining amenorrheic among these groups at different durations postpartum is presented in table 6.5. Figure 6.1 also shows the proportion of women remaining amenorrheic at each postpartum month for the "not breastfeeding", "full breastfeeding" and "breastfeeding with supplements" groups. The table and the figure show that for each of the groups, the proportion remaining amenorrheic decreases with increasing duration postpartum. This confirms the existence of a biological mechanism responsible for increasing the probability of return of fertility with increasing duration postpartum (Lee, 1988:209-213). In general, at the same time postpartum, and for most of the selected characteristics, women who are fully

breastfeeding are less likely to be menstruating than women breastfeeding with supplements. In turn, women breastfeeding with supplements are less likely to be menstruating than women not breastfeeding at all. This finding is consistent with those of similar studies elsewhere (Huffman *et al.*,1978:251-260; Chen *et al.*,1974:277-297).

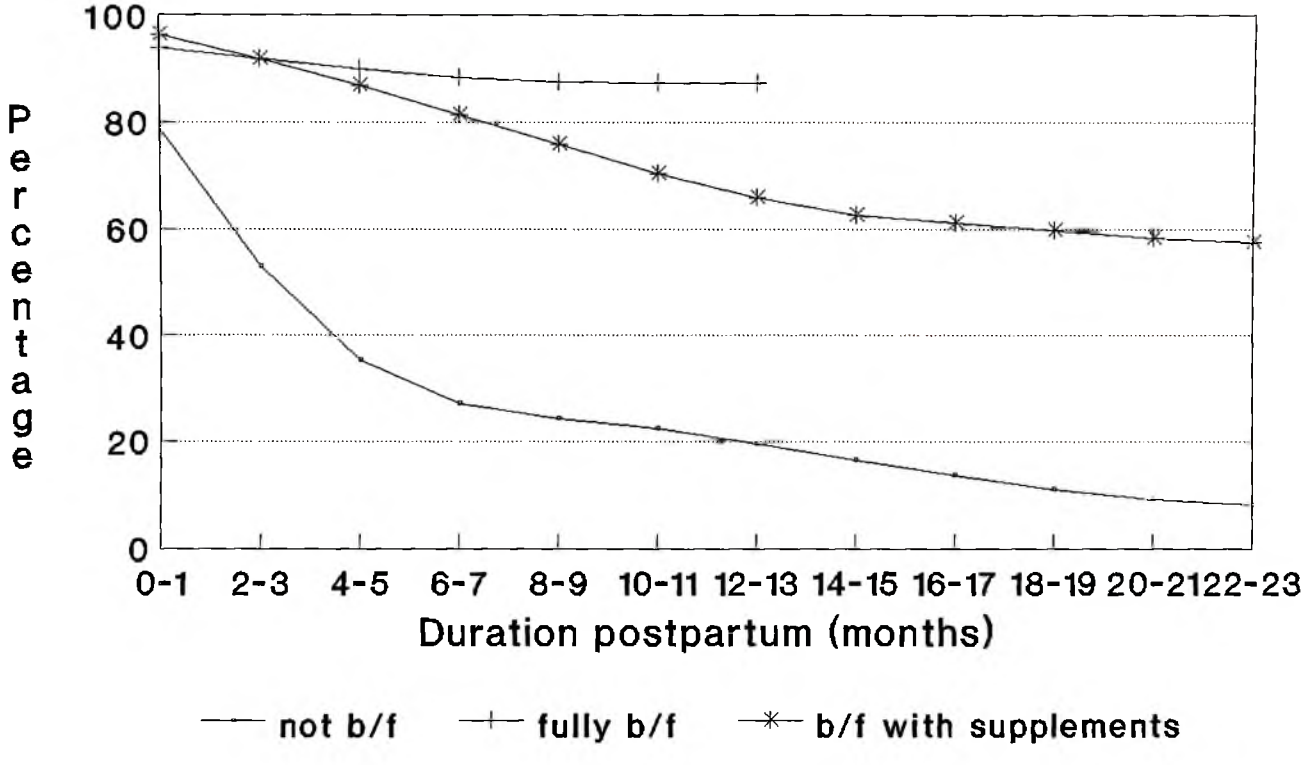
Table 6.5 Percentage of women remaining amenorrheic by type of breastfeeding behaviour and duration postpartum by selected characteristics.

SELECTED CHARACT-ERISTICS	DURATION POSTPARTUM (MONTHS): 0 4 Not B/F	0 4 Full	0 4 Supp.	5 8 Not B/F	5 8 Full	5 8 Supp.	9 15 Not B/F	9 15 Full	9 15 Supp.	ALL(0-15) Not B/F	ALL(0-15) Full	ALL(0-15) Supp.	NO OF WOMEN*
NIGERIA	53.0	93.1	91.7	26.6	87.6	81.7	18.7	68.1	65.5	26.0	89.6	76.0	2,253
REGION:													
Southeast	(52.9)	91.8	89.6		76.9	77.4	(15.3)	(52.4)	54.0	19.2	87.2	69.1	642
Southwest	(40.7)	96.6	93.9	(18.0)	94.5	78.0	(18.0)	89.3	72.5	21.3	94.6	80.3	442
Northwest	(68.4)	93.8	98.0	(33.3)	89.4	92.2	(24.7)	83.6	72.6	34.4	91.7	82.8	644
Northeast	(50.8)	92.8	83.4	(40.5)	87.4	79.0	(17.8)	41.9	66.2	30.5	87.7	73.0	524
RESIDENCE:													
Urban	(33.9)	89.2	88.0	(22.3)	80.8	70.2	(12.0)	(81.5)	63.2	16.7	87.3	72.0	474
Rural	57.9	93.8	93.2	28.3	88.2	85.3	21.6	66.4	66.1	29.7	90.0	77.1	1,779
EDUCATION:													
No Educ.	57.2	92.5	93.0	(37.0)	91.1	88.7	21.8	56.7	70.1	32.0	89.0	80.1	1,347
Primary	(68.7)	93.7	90.3	(26.5)	66.8	79.0	(15.8)	100.0	64.4	25.2	89.8	74.6	592
Sec.+	(14.9)	96.8	90.7	(7.1)	(97.2)	62.9	(15.2)	(100.0)	45.0	(13.4)	96.9	63.1	314
SEX OF CHILD:													
Boy	48.2	93.3	92.7	(19.6)	91.1	81.8	16.4	70.7	62.9	23.1	90.7	75.1	1,139
Girl	59.5	92.8	90.6	(33.7)	84.4	81.7	20.7	63.9	68.2	28.9	88.4	76.9	1,114
PLACE OF WORK:													
Not wkg.	54.8	91.7	92.1	(22.6)	87.9	82.9	28.9	67.0	66.3	32.5	88.8	76.8	793
Work home	(53.8)	88.6	94.5	(27.3)	90.7	84.6	(13.4)	76.4	70.0	21.1	88.1	79.0	559
Work away	(50.0)	98.5	90.4	(30.8)	85.0	78.7	(11.6)	(61.2)	61.8	20.2	91.8	73.5	884

NOTE: Not B/F -not breastfeeding, Full -fully breastfeeding, Supp -breastfeeding with supplements, Wkg -working, Educ -education, Sec+ -secondary and above, ( ) -based on less than 10 cases.
* -totals for some characteristics are less than the overall sample because of missing values.
Source: NDHS, 1990 Raw data file.

Although those not breastfeeding are few in most of categories, the proportion amenorrheic are much lower than for the two other categories.

Figure 6.1 Percent amenorrheic according to breastfeeding status and duration postpartum.



SOURCE: NDHS, 1990 RAW DATA FILE.

The effect of breastfeeding on postpartum amenorrhea was further examined using logistic regression procedure. The current status information on breastfeeding and amenorrhea and last 24 hours information on food supplements form the basis for the analysis. As earlier mentioned, limiting the analysis to the current status information (that is, in the open interval) has a major limitation of biasing the results in favour of women with low fertility and long birth interval. To overcome this limitation, we decided to restrict the analysis to births in a specific time period (18 months) before the survey. This has however made the analysis interval-based rather than woman-based, a situation that may require some form of weighting scheme to adjust it to woman basis. Rutstein (1991) in his analysis of 23 DHS data sets has however suggested that the adjustment may not change the results significantly.

Information on dead children was also used because the death of a child leads to truncation of breastfeeding and early resumption of menstruation. Omitting them may result in under-representation of certain subgroups eg. women who lost their babies due to premature weaning or short duration of breastfeeding (Rutstein, 1991:898).

Although current theory and our earlier analysis have shown that durations of amenorrhea solely depends on breastfeeding behaviour, a number of other variables are also included in the regression model to see if they have additional explanatory power. The variables added include time since birth, mother's age, birth

order, region and place of residence and mother's level of education. The analysis was restricted to all mothers who had births in the 18 months preceding the interview, whether or not the child was alive at the time of the interview.

In order to investigate the impact of breastfeeding behaviour on amenorrhea, frequency of breastfeeding and introduction of various types of supplements were selected. Breastfeeding frequency as used here refers to the number of feeds given in the 24 hours preceding the survey. These frequencies were categorized into 0 (not breastfeeding), 1 to 3 feeds, 4 to 6 feeds and 7 or more feeds.

On type of supplementation, plain water, juice, powdered milk and any other liquids or solids/mushy foods given anytime in the previous day or last night were used. The responses were grouped into plain water, any milk, other liquids and solid/mushy foods. Children not currently breastfeeding were grouped as having received food in each of the categories. Table 6.6 presents the parameter estimates for the logistic regression model on variables explaining the probability of remaining postpartum amenorrheic. The overall prediction of 78.46 percent given by the model shows that the variables included in the analysis predicted amenorrhea relatively well. Similarly the highly significant model chi-square shows that at least one of the coefficient estimates for the regression is non-zero. Amenorrhea is significantly affected by time since birth (duration postpartum), frequency of breastfeeding and supplementation with solid foods in the country.

Table 6.6 Parameter estimates for logistic regression model on variables explaining the probability of remaining amenorrheic since the birth of a child delivered in the 18 months preceding the survey.

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
TIME SINCE BIRTH:			120.2951	6	.0000	.1838	
0-1 (Ref)	0.0000						1.0000
2-3	-.7271	.3105	5.4835	1	.0192	.0330	.4833
4-6	-1.0768	.2818	14.6011	1	.0001	-.0627	.3407
7-9	-1.5271	.2787	30.0309	1	.0000	-.0935	.2172
10-12	-1.7605	.2854	38.0551	1	.0000	.1060	.1720
13-15	-2.2949	.2808	66.7964	1	.0000	-.1421	.1008
16-18	-2.1945	.2849	59.3180	1	.0000	-.1337	.1114
FREQUENCY OF BREASTFEEDING:			259.7621	3	.0000	.2813	
0	-2.6013	.1621	257.5106	1	.0000	.2823	.0742
1-3	.0938	.3466	.0732	1	.7867	.0000	1.0983
4-6	-.2231	.1754	1.6188	1	.2033	.0000	.8000
7 and above (Ref)	0.0000						1.0000
SOLID FOODS:							
No (Ref)	0.0000						1.0000
Yes	-.3692	.1247	8.7625	1	.0031	.0459	.6913
BIRTH ORDER:			9.5986	3	.0223	.0335	
1-2 (Ref)	0.0000						1.0000
3-4	.2159	.1310	2.7187	1	.0992	.0150	1.2410
5-6	.4643	.1550	8.9734	1	.0027	.0466	1.5908
7+	.1101	.1575	.4888	1	.4845	.0000	1.1164
REGION:			39.6091	3	.0000	.1024	
Southeast	-.0914	.1535	.3545	1	.5516	.0000	.9126
Southwest	.7082	.1819	15.1601	1	.0001	.0641	2.0304
Northwest	.6145	.1538	15.9634	1	.0001	.0660	1.8487
Northeast (Ref)	0.0000						1.0000
EDUCATION:			14.4695	2	.0007	.0571	
No Education (Ref)	0.0000						1.0000
Primary	-.1857	.1391	1.7825	1	.1818	.0000	.8305
Secondary+	.6805	.1803	14.2493	1	.0002	-.0618	.5064
RESIDENCE:							
Urban	.6604	.1382	22.8360	1	.0000	-.0806	.5167
Rural (Ref)	0.0000						1.0000

Number of cases included in the analysis: 2,553
Overall Prediction: 78.46%
Model Chi-Square: 851.677 **Significance:** .0000

NOTE: Ref -reference category B -log odds, Exp(B) -odds, S.E -standard error, df -degree of freedom, Sig -significance, R -partial correlation, Wald -Wald statistics.
Source: NDHS, 1990 Raw data file.

The odds (Exp(B)) and the corresponding R-statistics for the categories of variable 'time since birth' show that with increase in duration postpartum the odds of remaining amenorrheic are decreased.

Increase in frequency of breastfeeding increases the odds of remaining amenorrheic. The coefficient estimates for frequency of breastfeeding suggest that breastfeeding 4 to 6 times in a day reduces the odds of remaining amenorrheic by a factor of 0.8 compared to breastfeeding seven or more times a day. Not breastfeeding reduces the odds of remaining amenorrheic by a factor of 0.07 when compared with breastfeeding 7 times or more and it is highly significant. Though the table indicates that breastfeeding 1 to 3 times a day increases the odds by a factor of 1.1, the corresponding Wald statistic is however not statistically significant. Introduction of solid/mushy foods decreases the odds of remaining amenorrheic. Amenorrhea is significantly predicted by birth order, region and place of residence and mother's level of education.

The regression results show that the more children a woman has born, the greater is her chance of being amenorrheic, after controlling for the effects of other factors. Having had 5 or 6 children increases the odds of being amenorrheic by a factor of 1.6 compared to birth order 1 or 2 (reference category). The reason for this finding is unclear. It has however been suggested that it may be due to biological or non-volitional fecundity impairments that increase with parity (Rutstein, 1991:901; Page ***et al.***,1982:57).

As expected, education reduces the odds of remaining amenorrheic. Compared to no formal education, secondary and above education reduces the odds remaining amenorrheic by a factor of 0.5, while primary education reduces the odds by a factor of 0.8.

Urban residence also reduces the odds of remaining amenorrheic compared with rural residence. Region of residence effects on amenorrhea indicates women from Southeast region compared with their Northeastern counterparts are less likely to remain amenorrheic. Southwest and Northwest mothers are more likely to remain amenorrheic compared with their Northeast counterparts.

6.3 BREASTFEEDING AND POSTPARTUM SEXUAL ABSTINENCE

Abstaining from sexual relations for some time after childbirth is a common phenomenon in many societies. Apart from the physiological condition of a woman that has just delivered which may not be conducive for sexual activity, sexual abstinence is often reinforced by cultural sanctions or taboos as earlier reviewed. Table 6.7 presents the prevalence/incidence mean duration of postpartum sexual abstinence according to age of mother at birth and selected background characteristics.

Younger women have shorter duration of postpartum sexual abstinence than their older counterparts. This may be due to differences in socio-economic characteristics of the birth cohorts such as education, place of work, urban residence and use of contraception which are all different faces of modernization. For example, younger women have earlier been observed to be more educated than older women. A more educated woman is less likely to still respect the traditional postpartum sex taboos. She is also more likely to be using modern contraceptives to avoid early pregnancy after child birth. All these attributes are more likely

to make postpartum sexual abstinence unnecessary. The finding is also consistent with the results of similar studies done in Southwest Nigeria (Orubuloye, 1981).

Table 6.7 Prevalence/Incidence mean duration of Abstinence (months) according to age of mother at birth of the child and selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:			ALL WOMEN	TOTAL BIRTHS
	15-24	25-34	35-49		
NIGERIA	12.7	15.9	23.5	15.5	9,157
REGION:					
Southeast	11.5	14.8	22.7	14.6	2,719
Southwest	15.5	17.2	25.5	18.0	1,683
Northwest	12.6	16.8	25.4	15.6	2,568
Northeast	12.4	15.3	21.0	14.6	2,187
RESIDENCE:					
Urban	8.3	16.3	23.3	15.0	1,911
Rural	13.1	15.7	23.6	15.6	7,245
EDUCATION:					
No Education	12.4	15.7	24.3	16.0	5,828
Primary	13.3	18.0	20.8	15.8	2,269
Secondary+	12.7	12.6	18.0	12.8	1,059
SEX OF CHILD:					
Boy	13.4	17.5	23.0	16.3	4,562
Girl	12.0	14.3	24.0	14.7	4,595

NOTE: * -totals for some characteristics are less than the overall sample because of missing values.
Source: NDHS, 1990 Raw data file.

Southwest region has the highest mean duration of postpartum sexual abstinence (18.0 months). Though this is at variance with the shortest mean duration of full and any breastfeeding observed for the region, the finding appears to be in consonance with the very long traditionally prescribed duration of abstinence among the Yorubas which used to be 30 to 36 months (Orubuloye, 1979). Longer durations of sexual abstinence that sometimes exceeded the period of weaning have been reported in a number studies carried out in

the Southwestern part of the country (National Population Bureau, 1984; Orubuloye, 1981; Orubuloye, 1979; Caldwell and Caldwell, 1977).

The difference in the mean duration of abstinence between the urban and rural areas in the country is less than one month. This is rather surprising when one considers the longer mean duration of breastfeeding earlier observed for rural respondents and the fact that rural women are more likely to still respect postpartum sex taboos. This may however suggest an apparent erosion of the general respect of the traditional norms that reinforce abstinence even in the rural area. It may also be due to suspect reporting of abstinence status by respondents.

Education is observed to be negatively associated with mean duration of postpartum sexual abstinence. This finding is expected. Apart from widening women's horizon, education facilitates the development of more rational views about situations and phenomena. The finding with respect to education therefore reinforces the expectation that more educated women who are more likely to realize that the belief system underlying postpartum sexual taboos has no rational base, will be less likely to adhere to traditional postpartum sex taboos (Feyisetan, 1990:125). The mean duration of abstinence following a female birth is almost two months shorter than for a male birth. This may be a reflection of the desire to have male children. Couples may have decided to shorten their abstinence duration in order to provide an opportunity to have a male baby sooner. On the other hand, they simply may have given

more care to the infant of preferred sex, in this case male child, by prolonging duration of breastfeeding and sufficiently abstaining to ensure that early engagement in sexual relations does not impair the health status and survival chances of the child (Jain and Bongaarts, 1980:313).

Table 6.8 also presents the mean duration of postpartum sexual abstinence in the last closed birth interval by reported duration of breastfeeding. A positive association is also observed between duration of breastfeeding and sexual abstinence.

Table 6.8 Mean duration of postpartum sexual abstinence in the last closed birth interval for all ever married women by reported duration of breastfeeding.

Duration of Breastfeeding (months)	Mean Duration of Abstinence (months)	Number of Cases
0	5.5	6
1	5.7	8
2	4.7	11
3	7.5	11
4-5	6.5	23
6	8.2	22
7-8	7.4	56
9-11	7.2	133
12	9.0	352
13-17	9.7	517
18	11.5	454
19-23	10.6	347
24	14.2	385
25-29	18.7	58
30-36	21.4	28
All	10.9	2,411

Source: NDHS, 1990 Raw data file.

It is important to note that for most breastfeeding durations up to 8 months, the mean duration of abstinence is longer than the

duration of breastfeeding. This is in conformity with the common belief that engagement in sexual relations during breastfeeding is detrimental to the health and survival of the babies (van de Walle, 1987). It is very likely that other pressures made the women disregard this belief for periods over 8 months after child birth (National Population Bureau, 1984).

Table 6.9 presents the percentage of women abstaining by type of breastfeeding according to duration postpartum and background characteristics.

Table 6.9 Percentage of women abstaining by type of breastfeeding behaviour and duration postpartum by selected characteristics.

	DURATION POSTPARTUM (MONTHS):												
	0 4			5 8			9 15			ALL(0 15)			
	Not B/F	Full	Supp.	Not B/F	Full	Supp.	Not B/F	Full	Supp.	Not B/F	Full	Supp.	NO OF WOMEN*
NIGERIA	58.6	94.1	90.3	37.3	69.4	65.7	14.9	56.0	51.8	26.6	84.5	63.9	2,252
REGION:													
Southeast	(52.9)	100.0	92.6	(9.0)	68.2	73.3	(10.3)	(52.4)	50.4	(15.9)	92.3	66.7	640
Southwest	(58.8)	100.0	96.7	(50.2)	98.9	76.0	21.2	(79.6)	65.3	33.3	96.3	77.7	443
Northwest	(64.1)	93.6	80.6	(45.7)	58.2	52.6	(9.7)	53.5	44.6	28.3	80.7	52.9	644
Northeast	(57.1)	87.8	87.2	(14.2)	69.5	59.5	(18.6)	(44.5)	53.0	26.7	79.4	60.4	524
RESIDENCE:													
Urban	(38.5)	97.3	89.5	(30.7)	93.1	69.1	(11.3)	(100.0)	60.1	18.5	96.8	70.7	475
Rural	63.7	93.4	90.6	40.0	67.1	64.6	16.5	50.4	49.9	29.9	82.6	62.0	1,777
EDUCATION:													
No Educ.	59.6	90.9	85.5	41.1	70.6	65.7	14.1	52.5	48.8	28.5	81.6	60.6	1,347
Primary	(68.7)	99.8	96.2	(10.9)	54.3	67.4	(12.8)	(63.8)	59.2	20.2	89.6	70.0	590
Sec.+	(41.1)	100.0	93.3	(52.9)	(97.2)	63.0	18.7	(100.0)	50.5	28.8	99.3	65.8	314
SEX OF CHILD:													
Boy	56.4	95.4	92.4	43.6	75.6	67.7	16.8	47.9	54.9	29.7	86.3	67.0	1,137
Girl	61.5	92.5	87.8	(30.7)	63.8	63.9	13.2	69.2	48.7	23.6	82.4	61.0	1,115
PLACE OF WORK:													
Not wkg.	56.1	92.0	87.1	46.0	66.0	63.5	26.7	49.4	47.0	38.6	81.4	60.1	793
Work home	(72.6)	91.7	88.5	(24.7)	59.6	52.0	(16.2)	(81.7)	50.6	25.2	83.6	57.2	559
Work away	(51.0)	98.7	92.9	(25.6)	82.2	75.5	(6.1)	(52.1)	56.4	15.9	90.4	70.6	883

NOTE: Not B/F -not breastfeeding, Full -fully breastfeeding, Supp -breastfeeding with supplements, Wkg -working, Educ -education, Sec+ -secondary and above, ( ) -based on less than 10 cases.
Source: NDHS, 1990 Raw data file.

In general the percentage of women abstaining is observed to decrease with duration postpartum for all types of breastfeeding practices. However, for fully breastfeeding women, proportions abstaining are higher compared to women who breastfeed with supplements. Although estimates for those not breastfeeding are in most cases based on fewer number of cases, they show that relatively lower proportion of women not breastfeeding were still abstaining from sexual relations as at the time of interview. In order to further examine the impact of breastfeeding on postpartum sexual abstinence, the logistic regression model on current status data at the time of interview was employed. The dependent variable is the dichotomous variable of whether or not a woman has been abstaining from sexual relations since the child's birth. The independent variables include time since birth, frequency of breastfeeding, supplementation with plain water, milk, other liquids and solids, use of feeding bottles, mother's age, education, region and place of residence and birth order. In addition, amenorrhea status was also added as an intervening variable. In other words, breastfeeding behaviour affects amenorrheic status which in turn affects abstinence. This is particularly true when women wait until their menstrual cycle returns before they engage in any sexual relations.

Table 6.10 presents the parameter estimates of the logistic regression on variables explaining the probability of abstaining from sexual relations since birth of a child. The variables included in the model gave an overall prediction of 71.87 percent

and a highly significant model chi-square. As expected, time since birth and amenorrheic status are highly significant. The odds reduces with increase in time since birth and this indicates a negative impact on the probability of abstaining.

Table 6.10 Parameter estimates for logistic regression model on variables explaining the probability of abstaining from sexual relations since the birth of a child delivered in the 18 months preceding the survey.

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
TIME SINCE BIRTH:			205.2275	6	.0000	.2362	
0-1 (Ref)	0.0000						1.0000
2-3	-.9591	.3386	8.0218	1	.0046	-.0417	.3833
4-6	-2.2008	.3015	53.2820	1	.0000	-.1217	.1107
7-9	-2.6823	.2995	80.1857	1	.0000	-.1502	.0684
10-12	-2.8210	.3058	85.1171	1	.0000	-.1549	.0595
13-15	-3.1841	.3027	110.6853	1	.0000	-.1771	.0414
16-18	-2.9998	.3054	96.4970	1	.0000	-.1652	.0498
FREQUENCY OF BREASTFEEDING:			105.6006	3	.0000	.1696	
0	-1.6246	.1591	104.2018	1	.0000	-.1718	.1970
1-3	-.2740	.3382	.6565	1	.4178	.0000	.7603
4-6	-.0111	.1673	.0044	1	.9469	.0000	.9889
7+ (Ref)	0.0000						1.0000
BIRTH ORDER:			14.1149	3	.0028	.0484	
1-2 (Ref)	0.0000						1.0000
3-4	-.4118	.1334	9.5244	1	.0020	-.0466	.6625
5-6	-.5402	.1649	10.7314	1	.0011	-.0502	.5826
7+	-.5466	.1877	8.4766	1	.0036	-.0432	.5789
PLAIN WATER:							
Yes	-.9178	.3334	7.5777	1	.0059	-.0401	.3994
No (Ref)	0.0000						1.0000
AMENORRHEIC?:							
No	-.9264	.1135	66.6418	1	.0000	-.1366	.3960
Yes (Ref)	0.0000						1.0000
RESIDENCE:							
Urban	.2336	.1308	3.1910	1	.0740	.0185	1.2631
Rural (Ref)	0.0000						1.0000
REGION:			64.1119	3	.0000	.1295	
Southeast	.2160	.1306	2.7360	1	.0981	.0146	1.2411
Southwest	.5010	.1580	10.0586	1	.0015	.0482	1.6504
Northwest	-.6085	.1341	20.5781	1	.0000	-.0732	.5441
Northeast (Ref)	0.0000						1.0000
AGE OF MOTHER:			20.1138	2	.0000	.0682	
15-24	-.8076	.1931	17.4850	1	.0000	-.0669	.4459
25-34	-.3089	.1550	3.9716	1	.0463	-.0239	.7342
35+ (Ref)	0.0000						1.0000

Number of cases: 2,553 **Model Chi-Square**: 837.570 **Significance**: .0000
Overall Prediction: 71.87%

NOTE: Ref -reference category B -log odds, Exp(B) -odds, S.E -standard error, df -degree of freedom, Sig -significance, R -partial correlation, Wald -Wald statistics.
Source: NDHS, 1990 Raw data file.

Menstruation reduces the odds of abstaining by a factor of 0.4 compared to still amenorrheic status. This finding is consistent with those of a similar study done using 23 DHSI data sets (Rutstein, 1991:897-924). Breastfeeding frequency effect on abstinence indicates that non-breastfeeding reduces the odds of a woman's sexually abstaining by a factor of 0.2 compared to breastfeeding seven times or more per day. In general, the odds of abstaining increases with increasing frequency of breastfeeding. Supplementation with plain water is significant and indicates that women already giving plain water are less likely to be abstaining. Women's age, region and place of residence have significant effects on postpartum sexual abstinence. In summary, breastfeeding in the main acts through postpartum amenorrhea in influencing abstinence.

6.4 POSTPARTUM NON-SUSCEPTIBILITY

The postpartum non-susceptible period is the average length of time for which women cannot conceive either because of lactational amenorrhea or because of postpartum abstinence. It is longer than the average length of postpartum amenorrhea or abstinence alone, because some women who do not abstain are non-susceptible because of amenorrhea, and some women who have short amenorrhea are non-susceptible because they abstain from intercourse (Odile and Bongaarts, 1991:162). Table 6.11 presents the prevalence/incidence mean duration of postpartum non-susceptible period based on all births 36 months before the survey, for selected background characteristics controlling for age of mother at birth.

age of mother at birth according to selected background characteristics.

Table 6.11 Prevalence/Incidence mean duration of postpartum non-susceptible period controlling for age of mother at birth and selected background characteristics.

SELECTED CHARACTERISTICS	AGE OF MOTHER AT BIRTH:			ALL WOMEN	TOTAL BIRTHS*
	15-24	25-34	35-49		
NIGERIA	18.8	21.9	29.5	21.6	9,157
REGION:					
Southeast	15.2	18.8	26.0	18.4	2,719
Southwest	19.1	19.4	27.6	20.7	1,683
Northwest	21.0	25.4	37.1	24.4	2,568
Northeast	19.6	25.3	29.4	22.9	2,187
RESIDENCE:					
Urban	14.9	19.7	27.4	18.7	1,911
Rural	19.7	22.6	30.0	22.3	7,245
EDUCATION:					
No Education	20.4	22.9	31.2	23.3	5,828
Primary	17.6	22.4	23.3	20.0	2,269
Secondary+	16.0	15.9	19.8	16.1	1,059
PLACE OF WORK:					
Not working	20.2	25.2	30.1	22.9	2,864
Working at home	17.6	21.6	25.8	20.7	2,232
Working away	17.7	20.5	31.8	21.1	3,986
SEX OF CHILD:					
Boy	18.8	23.1	29.2	22.0	4,562
Girl	18.7	20.7	29.7	21.2	4,595
ASSISTANCE AT DELIVERY:					
Medical Personnel	16.9	19.2	24.5	19.0	2,959
TBA	16.9	24.1	24.9	20.6	2,110
Others or No one	21.2	23.1	35.6	24.0	3,969

NOTE: TBA -traditional birth attendant
* -totals for some characteristics are less than the overall sample because of missing values.
Source: NDHS, 1990 Raw data file.

The mean duration of non-susceptible period for the whole sample is about 21.6 months, about four months longer than the mean duration of amenorrhea and six months longer than the mean duration

of abstinence. Since the duration of postpartum non-susceptible period in the absence of breastfeeding is about 2 months then it follows that the additional period added by the combined effects of postpartum amenorrhea and postpartum sexual abstinence is about 19.6 months. Most of this addition is by lactational amenorrhea (about 15.3 months) but postpartum sexual abstinence lengthens the postpartum non-susceptible period by an additional 4.3 months.

The pattern of mean duration of postpartum non-susceptible period is similar to that of mean duration of amenorrhea and abstinence, that is, it varies directly with the age of women. The pattern is maintained for all the selected characteristics in the table. Women residing in urban areas reported lower mean duration of postpartum non-susceptible period. It is also observed to be negatively associated with level of education.

Mean duration of postpartum non-susceptible period is higher in the North than in the South. There appear to be not much sex differential in the mean duration of postpartum non-susceptible period following a birth. Women not currently working have slightly higher mean duration of non-susceptible period compared to those either working at home or away from home. Women assisted at delivery by medical personnel have slightly lower mean duration when compared to those assisted at delivery by TBA.

6.5 BREASTFEEDING AND USE OF CONTRACEPTION

The relationship between breastfeeding and contraceptive use is complex. In assessing the effect of contraception on

contraception with a lot of emphasis on the effects of estrogens and/or progestin on the quantity and content of breast milk (McCann *et al.*,1981:544-547). Most of the studies have suggested that combined oral contraceptives at certain doses reduce the volume of breastmilk in some women. This may make a woman delay using the pill, injection or Norplant, until such a time that she is prepared to stop breastfeeding. On the other hand, she may also refrain from using hormonal methods because of the fear that they may affect the quality of her breastmilk. Even when she decides to use the hormonal methods she may resolve to either terminate breastfeeding because of reduction in her milk production or the fear of contamination. There is also the situation where a woman who is breastfeeding may feel she is protected from conception even when she is not amenorrheic.

Prevalence of contraception is very low in Nigeria. It is even lower when considered for breastfeeding women. Table 6.12 presents the use of contraception according to method by breastfeeding women and amenorrheic status among women with a birth in the five years preceding the survey by selected characteristics. Contraceptive use is considerably reduced by postpartum amenorrheic women. About 1.9 percent of contraceptive users are currently amenorrheic. The level of double protection is comparatively higher for urban residents and women with secondary and above education than their rural and uneducated counterparts respectively.

Table 6.12 Percent using contraception among breastfeeding women and amenorrheic status among women with a birth in five years preceding the survey by selected characteristics.

	BREASTFEEDING WOMEN:					PERCENT USING CONTRACEPTION:	
	Pill	Injec-tion	IUD	Female Ster.	Any method	Amenorrheic	Not Amenorrheic
NIGERIA	0.5	0.3	0.2	0.1	2.9	1.9	6.6
REGION:							
Southeast	1.1	0.5	0.7	0.5	5.5	3.3	9.3
Southwest	0.7	0.4	0.2	0.2	5.7	3.6	16.2
Northwest	0.3				1.0	0.7	1.5
Northeast		0.4	0.1		1.0	1.3	2.3
RESIDENCE:							
Urban	1.1	0.8	0.2	0.2	6.0	4.7	17.8
Rural	0.3	0.2	0.3	0.0	2.2	3.9	1.3
EDUCATION:							
No Educ.	0.2	0.4	0.1		1.3	1.1	2.3
Primary	0.6	0.1	0.3	0.2	2.9	2.1	9.7
Sec.+	1.6	0.3	0.8		13.5	7.4	25.3
AGE OF WOMEN:							
15-24	0.6	0.2	0.1		3.2	1.7	5.8
25-34	0.4	0.1	0.4	0	2.7	2.1	6.8
35+	6.5	0.9	0.2	0.2	2.9	1.9	8.4
PLACE OF WORK:							
Not Wkg.	0.1	0.5			1.3	1.0	3.2
Wkg home	0.2	0	0.2		2.3	2.1	6.5
Wkg away	1.0	0.3	0.5	0.1	4.5	2.6	9.6

NOTE: Educ. -education, Sec.+ -secondary and above, Wkg -working
Source: NDHS, 1990 Raw data file.

As a result of associations between breastfeeding and contraceptive use, and a number of socio-economic and demographic characteristics of mothers, a multivariate analysis technique is considered to be more suitable in partialling out the effects of breastfeeding behaviour. Consequently, logistic regression procedure was used to predict the probability that a woman was using contraception at the time of the survey. The dependent variable is the dichotomous variable of whether or not a woman, who had a birth 18 months before the survey, is currently using contraception. The independent variables are those used in the amenorrhea/breastfeeding analysis in addition to the amenorrheic and abstinence status variables. Table 6.13 presents the parameter

estimates of the variables explaining the probability of using contraception.

Table 6.13 Parameter estimates for logistic regression model on variables explaining the probability of using contraception since the birth of a child delivered in the 18 months preceding the survey.

EXPLANATORY VARIABLES	B	S.E.	Wald	df	Sig	R	Exp(B)
FREQUENCY OF BREASTFEEDING:			8.7343	3	.0330	.0553	
0	-.0154	.2947	.0027	1	.9584	.0000	.9847
1-3	1.0589	.5696	3.4567	1	.0630	.0404	2.8833
4-6	.7944	.3395	5.4756	1	.0193	.0624	2.2130
7+ (Ref)	0.0000						1.0000
BOTTLE FEEDING:							
No	.6084	.2526	5.8027	1	.0160	-.0652	.5442
Yes (Ref)	0.0000						1.0000
AMENORRHEIC?:							
No	.6865	.2637	6.7772	1	.0092	.0731	1.9867
Yes (Ref)	0.0000						1.0000
ABSTAINING?:							
No	1.8419	.2794	43.4541	1	.0000	.2154	6.3084
Yes (Ref)	0.0000						1.0000
REGION:			6.4102	3	.0933	.0214	
Southeast	.5369	.4163	1.6638	1	.1971	.0000	1.7107
Southwest	.6230	.4416	1.9902	1	.1583	.0000	1.8644
Northwest	.4716	.4966	.9015	1	.3424	.0000	.6240
Northeast (Ref)	0.0000						1.0000
EDUCATION:			33.6006	2	.0000	.1820	
No Education (Ref)	0.0000						1.0000
Primary	.4428	.3476	1.6234	1	.2026	.0000	1.5571
Secondary+	1.7368	.3514	24.4241	1	.0000	.1584	5.6792
RESIDENCE:							
Urban	.5950	.2524	5.5547	1	.0184	.0631	1.8130
Rural (Ref)	0.0000						1.0000
AGE OF MOTHER:			5.6957	2	.0580	.0436	
15-24	-.8298	.3500	5.6191	1	.0178	-.0636	.4361
25-34	-.6146	.3205	3.6776	1	.0551	-.0433	.5409
35+ (Ref)	0.0000						1.0000

Number of cases included in the analysis: 2,526
Overall Prediction: 95.78%
Model Chi-Square: 234.513 **Significance:** .0000

NOTE: Ref -reference category B -log odds, Exp(B) -odds, S.E -standard error, df -degree of freedom, Sig -significance, R -partial correlation, Wald -Wald statistics.
Source: NDHS, 1990 Raw data file.

In this model, only the coefficients of frequency of breastfeeding, bottle feeding, amenorrhea, abstinence, region and place of

residence, education and age of mother are significantly different from 0 using a significance level of 0.05.

Not sexually abstaining or not amenorrheic increases the odds of using contraception. Not currently abstaining increases the odds of using contraception by a factor of 6.3 compared to currently abstaining. This is expected in that a mother who is currently abstaining from sexual relations does not require contraception since she is not at risk of pregnancy. On the other hand, women who have resumed sexual relations after birth are more likely to use contraception to avoid becoming pregnant too early after a birth (Feyisetan, 1990:125). Similarly, a woman that is currently amenorrheic compared to those not currently amenorrheic is more protected from the risk of pregnancy and hence may consider the use of contraception unnecessary. Women who are not currently amenorrheic compared to those who are currently amenorrheic are two times more likely to use contraception in the country.

Bottle feeding increases the odds of using contraception. This is expected, as women not currently feeding their babies from feeding bottles are more likely to be practising full breastfeeding, a practice that is generally considered to be incompatible with sexual relations because of the fear that the breast milk may be poisoned by the man's semen.
She may also feel that contraceptives will affect the quality and quantity of her milk. She would therefore find it unnecessary to use contraception. On the other hand, a woman not using feeding bottle because she is fully breastfeeding her baby, may feel that

she is protected by her breastfeeding practice and hence does not require to use any contraception.

Apart from these two intervening variables, frequency of breastfeeding had significant effect in the country. As expected, education of mothers is significant in the country and increases the odds of using contraception. Southern residence, as expected, increases the odds of using contraception.

6.6 PROTECTION FROM PREGNANCY

Having discussed the incidence and duration of postpartum amenorrhea, it may be interesting to see how much protection is offered by lactational amenorrhea. This is done by examining the percentage of women currently using contraception in conjunction with those not using but are lactational amenorrheic. Those using contraception and are also amenorrheic have double protection and are therefore considered once and with those using contraception. Consequently, a woman considered protected by lactational amenorrhea is one who is not using contraception, is breastfeeding, amenorrheic and who gave birth less than 6 months ago. Table 6.14 presents the percentage of currently married women who are protected from becoming pregnant by contraception, lactational amenorrhea, and/or both together. The table shows that lactational amenorrhea increases the protection from pregnancy afforded by contraception by about 16.4 percent in the country. This result is in agreement with the results obtained for some West and East African countries from a similar study done using 23 DHSI data sets

(Rutstein, 1991:904-905,920). For all the selected background characteristics, amenorrhea increases the protection from pregnancy afforded by contraception by between 12.6 and 19.3 percent. Since those groups of women with low levels of contraceptive use are in most cases those with longer durations of amenorrhea, it is not surprising therefore that lack of protection from non-use of contraception is somehow compensated for by amenorrhea (Rutstein, 1991:905).

Table 6.14 Percent of currently married women protected from pregnancy by contraception and lactational amenorrhea and proportion of protection provided by lactational amenorrhea by selected background characteristics.

CHARACTERISTICS	Total Fertility Rate(TFR)	Percent Using Contraception	Percent not using contraception but amenorrheic	Total Percent Protection	Percent of protection from lactational amenorrhea
NIGERIA	6.9	6.0	16.4	22.4	73.2
REGION:					
Southeast	6.7	8.9	16.7	25.6	65.2
Southwest	6.3	14.2	14.8	29.0	51.0
Northwest	7.7	1.4	17.5	18.9	92.6
Northeast	7.1	1.8	16.0	17.8	89.9
RESIDENCE:					
Urban	5.9	15.4	15.2	30.6	49.7
Rural	7.2	3.5	16.7	20.2	82.7
EDUCATION:					
No Educ.	7.5	2.1	15.5	17.6	88.1
Primary	7.2	8.6	18.6	27.2	68.4
Secondary+	5.0	23.2	16.4	39.6	41.4
PLACE OF WORK:					
Not working	6.7	2.5	19.3	21.5	89.8
Work at home	7.6	5.6	14.8	20.4	72.5
Working away	7.0	8.7	16.6	25.3	65.6

Note: Educ. -education, TFR obtained as 5 times the sum of age specific fertility rates of all women aged 15-49 years.
Source: NDHS, 1990 Raw data file.

The total percent protection from pregnancy in the country is only 22.4 percent, 73.2 percent of which is provided by lactational amenorrhea. The total percent protection from pregnancy is higher in the South than in the North, higher in the urban (30.6 percent)

than rural (20.2 percent), and is positively associated with education. Women working away from home have higher percent protection compared to their counterparts working at home or not gainfully employed. However, the variations in protection from pregnancy appear to be largely determined by differentials in the current use of contraception rather than differences in lactational amenorrhea (Rutstein, 1991:905).

The percentage contribution of protection from pregnancy provided by lactational amenorrhea ranges between 51.0 percent in the Southwest and as high as 92.6 percent in the Northwest. It is higher in the rural (82.7 percent) than urban areas (49.7 percent), and it is negatively associated with educational level. Women working away from home have lower percent protection from pregnancy due to lactational amenorrhea compared to their counterparts not gainfully employed or working at home.

6.7 BREASTFEEDING AND BIRTH INTERVAL LENGTHS

In trying to analyze the relationship between breastfeeding and actual fertility levels rather than fertility processes, we decided to use birth interval length. This is because for a married fecund woman, the rate of reproduction is inversely related to the average duration of birth interval. Short birth intervals are associated with high fertility (Bongaarts and Potter, 1983:4). But for some difficulty that may arise with women with incomplete maternity histories, birth interval analysis is a very direct way of evaluating the relationship between breastfeeding and fertility

(Page *et al.*,1982:50). With incomplete maternity histories one is unable to tell which of the women are currently in a birth interval that will one day be closed and which are in an interval that will never be closed. With this in view, restricting the birth interval-breastfeeding analysis to the last closed birth interval offers computational simplicity, but has a limitation of introducing selection biases as earlier discussed. There is under-representation of long intervals especially for women who have not been married very long. This calls for a lot of caution in the interpretation of results.

Available literature is replete with ample evidence of positive association between the duration of breastfeeding and the length of birth interval (Page *et al.*,1982:49-50; Jain and Bongaarts, 1981). In the absence of intrauterine mortality, the birth interval length comprises three components: postpartum amenorrhea or postpartum infecundable interval, menstruating interval or waiting time to conception and gestation period (Bongaarts and Potter, 1983:5). It is now well established that breastfeeding largely determines the duration of postpartum amenorrhea. If a woman does not breastfeed, menses returns within a short time after birth (Jain and Bongaarts, 1981; Chen *et al.*,1974:277-297). The earlier analysis has demonstrated, in consonance with some previous studies, that women who breastfeed fully have a lower probability of resuming menses earlier than women whose babies receive supplemental foods (Rutstein, 1991:900; Huffman *et al.*,1978:251-260; Perez *et al.*,1971). In addition, we

have also observed that breastfeeding is associated with postpartum sexual abstinence which, if prolonged beyond amenorrhea, will affect the birth interval lengths independent of the physiological effects of breastfeeding (Jain and Bongaarts, 1981).

Table 6.15 presents the average duration of the last closed birth interval (in months) by ever use of contraception and the duration of breastfeeding in the country and the four health regions. The average birth interval is found to be 29.4 months for the country and ranges from 28.7 months in the Southeast and 30.2 months in the Northeast. Use of contraception is associated with shorter birth interval length. Though use of contraception is expected to prolong the length of birth interval, the result obtained may partly be because of the definition of ever use of contraception variable used in the analysis. The variable does not necessarily refer to the last closed birth interval per se, and so may not accurately account for contraceptive use in the last closed birth interval.

Among women who had never used contraception, the average birth interval length increases with prolonged breastfeeding. For women who had never used contraception and did not breastfeed the last-but-one child, the average birth interval is about 23.2 months in the country and ranges between 16.3 months in the Southwest and 25.7 months in the Southeast. Though the birth interval estimates for those who did not breastfeed are generally lower than those who breastfed at least for sometime, the effect of not breastfeeding appears to be relatively more evident in the Southwest.

Table 6.15 Average duration of last closed birth interval (months) by ever use of contraception and duration of breastfeeding for those who had never used contraception in the country and the four health regions.

	REGION OF RESIDENCE:				
	Southeast	Southwest	Northwest	Northeast	Nigeria
NO OF CASES	826	448	534	591	2,400
Mean	28.7	29.7	29.5	30.2	29.4
SD.	9.5	9.7	9.7	10.7	9.9
USE OF CONTRACEPTION:					
Never used	29.0	29.9	29.5	30.4	29.7
Ever used	27.8	29.0	29.5	27.7	28.3
DURATION OF BREASTFEEDING (non-users):					
NBF	25.7	16.3	24.1	23.6	23.2
0-2	21.3	19.5	22.0	22.1	21.5
3-6	23.1	28.6	22.4	27.9	25.1
7-8	26.2	25.7	27.3	26.6	26.4
9-11	24.9	26.9	25.6	26.6	25.7
12	28.7	29.0	25.8	30.6	28.8
13-17	29.3	29.8	28.6	30.3	29.3
18	29.4	32.1	30.8	31.7	31.0
19-23	29.4	27.9	32.7	32.1	31.7
24	34.4	34.8	30.2	30.4	31.4
25+	35.2	35.2	31.5	30.3	33.5

NOTE:NBF -Never breastfed, SD.-standard deviation.
Source: NDHS, 1990 Raw data file.

Since the impact of breastfeeding may either be reinforced or compensated by the simultaneous impact of other variables, disentangling the role of each of them requires a multivariate analysis procedure. In the regression analysis employed to do this, succeeding birth interval lengths for all last-but-one children born five years before the survey were used as the dependent variable. The corresponding reported duration of breastfeeding for each of the births together with other socio-economic and demographic variables like age of women, education, place of residence, use of contraception, work status, sex and survival

status of child were used as independent variables. All independent variables except the age of mother and duration of breastfeeding were fed as dummy variables in the multiple linear regression procedure. Table 6.16 presents the summary of multiple regression analysis using the last closed birth interval as dependent variable. Duration of breastfeeding attained predictive significance in the country and all the health regions. The correlation and the partial regression coefficients indicate that there is a positive association between duration of breastfeeding and birth interval length.

In the model with breastfeeding as the only independent variable, breastfeeding attained predictive significance in the country and all the regions. On the average, one month of breastfeeding adds between 0.3 to 0.5 months to the birth interval. The explanatory power of the model ranged between about 3 and 8 percent. Even with the introduction of ever use of contraception, the explanatory power of the model and the effect of duration of breastfeeding remain virtually unchanged. In addition, ever use of contraception did not attain predictive significance in the country and all the health regions.

The model containing contraception with other socio-demographic variables have higher explanatory power. The duration of breastfeeding still attained predictive significance in the country and all the regions. Other variables that also influence the birth interval length are age of mother, and survival status of the child. However, apart from survival status, breastfeeding

remains the most significant factor that affects the birth interval length even when the effect of other predictors are controlled.

Table 6.16 Summary of multiple regression analysis using the last closed birth interval as the dependent variable for all women in the country and the four health regions.

	REGION OF RESIDENCE:				
	Southeast	Southwest	Northwest	Northeast	Nigeria
CORRELATION COEFFICIENTS					
BI & BF	.284	.269	.237	.180	.244
BI & CP	-.055	-.042	.003	.066	-.050
BI & ED	-.030	-.048	.010	-.095	.059
BF & CP	-.130	-.246	-.060	-.076	-.174
BF & ED	-.131	-.355	.093	-.190	-.268
CP & ED	.203	.265	.230	.079	.283
PARTIAL REGRESSION COEFFICIENTS					
Intercept	22.09	23.68	23.13	25.42	23.57
Breastfeeding	.458*	.410*	.375*	.265*	.368*
R2	.079	.070	.054	.031	.059
Intercept	22.22	23.39	23.09	25.69	23.64
Breastfeeding	.454*	.420*	.376*	.259*	.366*
Contraception	-.414	.550	.505	-1.964	-.214
R2	.079	.069	.053	.032	.059
Intercept	16.31	10.56	15.25	21.42	17.51
Breastfeeding	.393*	.345*	.243**	.144***	.287*
Contraception	-.603	-.905	.634	-2.533	-1.012
Age	.131***	.151	.205**	.123	.139*
W-Education	.788	1.140	.393	1.554	.050
Residence	-1.002	1.284	1.676	-.095	.592
Sex of Child	.319	.410	1.623***	-1.148	.274
Infant Death	2.794*	5.558*	4.354*	4.125*	3.699*
Work Status	-.005	3.517***	-1.214	.843	.163
R2	.095	.123	.110	.070	.085

NOTE: * Significant at p < .001, ** Significant at p < .01,
*** Significant at p < .05,
BI -birth interval, BF -breastfeeding, CP -contraception,
ED -education, R2 -adjusted R squared.
Source: NDHS, 1990 Raw data file.

6.8 EFFECT OF BREASTFEEDING ON FERTILITY USING BONGAARTS' MODEL

The Bongaarts model provides a useful tool for quantifying the relative importance of the proximate determinants of fertility. The

model is a multiplicative one which expresses the impact of the proximate determinants in terms of the extent to which each inhibits overall fertility. Detailed discussion on the model is given in appendix 2.1.

6.8.1 Estimates of Indexes of Proximate Determinants

Theoretically, each index can range from 0 to 1. The difference of each index from 1 can be taken as a proportionate reduction attributable to a particular component (Casterline *et al.*,1984; Bongaarts, 1980). Some details about the estimation of the indexes are given in appendix 2.1. Table 6.17 presents the estimates of the total fertility rate, the total marital fertility rate, the indexes of the intermediate fertility variables and the model total fertility rates for the country and selected background characteristics.

The index of proportion married for the country estimated as 0.86 is a reflection of the near universality of marriage in the country. It also shows that delay or non-marriage is responsible for about 14 percent reduction in the level of fertility that should prevail if all women were married throughout their reproductive lives.

Estimates of index of marriage for various categories of the selected characteristics also reveal the differential impact of marriage patterns. For example, while relatively high indexes observed for the Northern regions may reflect impact of early marriage, slightly lower values for the urban residents and those

with secondary and above education may be a reflection of the impact of modernization which may have resulted in delayed marriage.

Table 6.17 Estimates of the total fertility rates, the total marital fertility rates, the indexes of proximate determinants and the model estimates of the total fertility rates for the country and selected background characteristics.

	TOTAL FERTILITY RATE (TFR)	TOTAL MARITAL FERTILITY RATE (TMFR)	PREVALENCE OF CONTRACEPTIVE USE (U)	INDEXES OF PROXIMATE DETERMINANTS: (Cm)	(Cc)	(Cppam)	(Cppab)	(Ci)	MODEL ESTIMATE OF TOTAL FERTILITY (TFR)
NIGERIA	6.9	8.0	0.062	0.86	0.94	0.56	0.89	0.50	6.2
REGION:									
S/east	6.7	8.5	0.092	0.79	0.92	0.62	0.87	0.54	6.0
S/west	6.3	7.9	0.155	0.80	0.86	0.59	0.86	0.51	5.4
N/west	7.7	8.1	0.012	0.95	0.99	0.51	0.92	0.47	6.8
N/east	7.1	7.4	0.020	0.96	0.98	0.53	0.91	0.48	6.9
RESIDENCE:									
Urban	5.9	7.5	0.156	0.79	0.86	0.62	0.87	0.54	5.7
Rural	7.2	8.1	0.037	0.89	0.97	0.54	0.90	0.49	6.5
EDUCATION:									
No Educ.	7.5	7.9	0.020	0.95	0.98	0.53	0.91	0.48	6.8
Primary	7.2	8.3	0.098	0.87	0.91	0.59	0.88	0.52	6.3
Sec+	5.0	7.1	0.255	0.70	0.77	0.66	0.88	0.58	4.8

NOTE: S/west -Southwest, S/east -Southeast, N/west -Northwest, N/east -Northeast, Educ. -education, Sec+ -secondary and above, Cc -index of contraception, Ci -index of postpartum infecundability, Cppam -index of postpartum amenorrhea, Cppab -index of postpartum abstinence, Cm -index of marriage.
Source: NDHS, 1990 Raw data file.

In addition, the index of postpartum infecundability also mirrored the pattern of breastfeeding for various subgroups. Similarly, index of contraception mirrors the differential impact of contraception for the various categories of selected characteristics.

6.8.2 Fertility reducing impacts of the proximate determinants

The proportional reduction in fertility attributable to each of the indexes is the complement of each of the observed values. The fertility reducing impact of the proximate determinants is

obtained by the decomposition of difference between estimated and potential fertility. Details about the computation of the fertility reducing effects of the proximate determinants are also given in appendix 2.1. The proportional reduction in fertility from TF to TFR are expressed as percentages. This approach has an advantage of not including the absolute fertility levels in its calculation. The expression of the contribution of various indexes in percentages is a form of standardization, with percentage contributions of all determinants adding up to 100

Table 6.18 presents the results obtained from the analysis of percentage fertility reduction due to each of the proximate variables. The table clearly shows that postpartum infecundability due to lactation and abstinence beyond lactational amenorrhea is the principal inhibitor of fertility in the country and among all the selected subgroups. A very high proportion of the effect of postpartum infecundability is attributable to lactational amenorrhea. As expected, index of contraception consistently exerted the least fertility reducing effect.

Table 6.18 Percentage of overall reduction from Total Fecundity to observed Total Fertility Rate resulting from each proximate determinants for the country and selected background characteristics.

	PERCENTAGE REDUCTION DUE TO:					ABSOLUTE REDUCTION FROM TF TO TFR
	Delayed/ Non-marriage (Cm)	Use of Contraception (Cc)	Postpartum Infecundabilty (Ci)	Postpartum Amenorrhea (Cppam)	Postpartum Abstinence (Cppab)	
NIGERIA	16.6	6.6	76.7	64.0	12.8	9.1
REGION:						
Southeast	25.6	8.8	65.6	50.8	14.8	9.3
Southwest	21.0	14.4	64.7	50.2	14.4	9.9
Northwest	6.1	1.2	92.8	82.6	10.2	8.5
Northeast	5.1	2.5	92.4	80.5	11.9	8.4
RESIDENCE:						
Urban	23.9	14.9	61.2	47.5	13.8	9.6
Rural	13.9	3.5	83.6	71.4	12.2	8.8
EDUCATION:						
No Education	6.2	2.5	91.4	79.1	11.7	8.5
Primary	15.8	10.6	73.6	59.4	14.3	9.0
Secondary+	30.9	22.4	46.8	35.7	11.0	10.5

Source: NDHS, 1990 Raw data file.

A simple decomposition of the difference between estimated and potential fertility can bring out the number of averted births which of course is the combined inhibiting effect of proximate variables. Prorating the total averted births or inhibited component of the total fecundity using the above percentages gives the averted births due to each of the proximate variables. This is shown in table 6.19.

Considering the influence of all the proximate determinants of fertility including the combined index of infecundability due to both amenorrhea and abstinence shows that the index of infecundability averted about 7 births per woman. The impact of postpartum infecundability due to amenorrhea from the table clearly has the highest fertility reducing effect compared to other proximate determinants. It averted an average of about 6 births per woman. The impact of postpartum infecundability due to abstinence

averted about one birth per woman. This goes to show that though breastfeeding affects fertility through both abstinence and amenorrhea in the country, the inhibiting effect is more through the latter than the former.

Table 6.19 Total births averted by the proximate determinants for the country and selected background characteristics.

	BIRTHS AVERTED:					TOTAL BIRTHS AVERTED
	Delayed/ Non-marriage (Cm)	Use of Contraception (Cc)	Postpartum Infecundabilty (Ci)	Postpartum Amenorrhea (Cppam)	Postpartum Abstinence (Cppab)	
NIGERIA	1.5	0.6	7.0	5.8	1.2	9.1
REGION:						
Southeast	2.4	0.8	6.1	4.7	1.4	9.3
Southwest	2.1	1.4	6.4	5.0	1.4	9.9
Northwest	0.5	0.1	7.9	7.0	0.9	8.5
Northeast	0.4	0.2	7.8	6.8	1.0	8.4
RESIDENCE:						
Urban	2.3	1.4	5.9	4.6	1.3	9.6
Rural	1.2	0.3	7.4	6.3	1.1	8.8
EDUCATION:						
No Education	0.5	0.2	7.8	6.7	1.0	8.5
Primary	1.4	1.0	6.6	5.3	1.3	9.0
Secondary+	3.2	2.4	4.9	3.7	2.4	10.5

Source: NDHS, 1990 Raw data file.

The index of marriage averted on the average 1.5 births per woman to rank second after amenorrhea. As expected, considering the low prevalence of contraception in the country, contraception exerted the least inhibiting effect on the level of fertility. It only averted on the average 0.6 births.

6.9 SUMMARY

The analyses in this chapter have shown that mean duration of amenorrhea in the country is about 17 months while that of abstinence is 15 months. The mean duration postpartum

nonsusceptible period is about 22 months. It was also observed that these durations are longer for older cohorts. It was also established that the percentage of women remaining amenorrheic or abstaining from sexual relations after child birth by type of breastfeeding behaviour was higher for fully breastfeeding women than for those breastfeeding with supplements at given time postpartum. At a given time postpartum those breastfeeding more frequently are more likely to be amenorrheic compared to those not doing so.

The logistic regression analysis on the probability of remaining amenorrheic revealed that amenorrheic status is significantly predicted by frequency of breastfeeding, supplementation with solid/mushy foods and duration postpartum even after controlling for the effects of other factors. Logistic regression model on abstinence status showed that breastfeeding frequency and menstruation reduce the odds of abstaining. Similarly, the logistic regression analysis on use of contraception revealed that not sexually abstaining or not amenorrheic increases the odds of using contraception after controlling for the effects of other factors included in the model.

The analyses in the chapter also established that duration of breastfeeding positively influenced birth interval lengths in the last closed birth interval, even after controlling for the effects of other factors (age of mother, education, residence, contraception, work status, sex and survival status of child) included in the analysis.

Though the total percentage protection from pregnancy offered by lactation and contraception in the country and selected subgroups ranged from 17.6 to 39.6 percent, a considerably high proportion of the protection is from lactational amenorrhea. As expected, the proportion of protection from amenorrhea is higher in the North than in the South, higher in the rural than in the urban areas and negatively associated with the level of education.

Postpartum infecundability due to amenorrhea and abstinence exerted the greatest inhibiting effect by averting an average of 7 births per woman. The fertility-inhibiting effect of postpartum infecundability is more through amenorrhea than abstinence.

CHAPTER VII

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

7.1 SUMMARY AND CONCLUSIONS

The study set out with the general objective to describe the patterns and correlates of breastfeeding in Nigeria as well as to investigate its impact on fertility. The techniques of analysis employed in the study include simple cross-tabulations of means and percentages, multiple linear and logistic regression and multiple classification analysis. Bongaarts' model of analysis of proximate determinants was also applied to investigate the fertility-inhibiting effect of breastfeeding.

The analyses in preceding chapters provide broad insights into the breastfeeding situation in Nigeria as well as factors that influence it. They have also thrown some light on the fertility impact of breastfeeding in the country. The study has, therefore, provided the basis for some general conclusions.

The study carried out an evaluation of the data to be used, especially those on age, fertility and reported duration of breastfeeding. The aim was to identify probable sources and magnitude of errors and biases and possibly assess their impact on obtained estimates. Respondents' age reporting was found to be subject to a substantially high degree of heaping due to preference for certain digits, particularly 0 and 5. This is because majority of respondents could not completely report their exact date of birth or their exact ages which consequently had to be estimated. Age with incorrect final digit was reported for about 30 percent of

the women aged 20-49 years. The extent of age misreporting also varies considerably by the socio-economic characteristics of the respondents. It is slightly better in the urban than in rural areas. It is worst for respondents in the Northern regions than those in the Southern regions. Age misreporting was more characteristic of older respondents. The largest variations are observed with the levels of education. Heaping is less pronounced for respondents with secondary and above education and extreme for those with no formal education. Some distortions were also observed in the distribution of the respondents according to five-year age groups. The extent of such distortion was however not too severe as indicated by the estimated age accuracy index of 5.2.

The assessment of the quality of fertility data reveals that complete knowledge of exact dates of birth of children ever born is about 82 percent. The quality of birth date reporting is observed to be higher for Southern than for Northern respondents, urban than rural and positively associated with the level of education of mothers. The quality of birth date reporting is worst for dead children. The quality of birth date reporting for births in the last five years reveals an increasing percentage incompleteness as one gets further away from the year of interview (1990). The evaluation also presents evidence of bias in births reporting for births in the last five years. This is shown by a systematic tendency to push back the birth dates of older, eligible children by one or two years resulting in an erratic rise or fall (as opposed to a monotonic change in the annual births) in the data.

The extent of displacement is further illustrated by the birth year ratios for year 5 (1985) and year 6 (1984) before the survey.

The evaluation of breastfeeding data with particular reference to recall data on reported duration of breastfeeding, occurrence of missing values and heaping of responses was also done. Missing values and "don't know" responses were not common. However, for dead children the magnitude of missing values was high. Proportion of births with missing values of breastfeeding duration increases with increasing relative birth order.

Heaping at multiples of six months for reported breastfeeding duration is pronounced in the country as is characteristic of most developing countries. Heaping is most severe with rural, less educated and Northern respondents. One of the reasons for the relatively more severe heaping with the women with no education is that they have to report on longer durations of breastfeeding, thus making their responses more likely to be heaped on multiples of six months.

In order to fully understand and interpret the patterns, correlates and fertility effects of breastfeeding behaviour the study analyzed the background characteristics of survey respondents. About six out of every 10 of the surveyed women have no formal education and almost the same proportion cannot read and understand at all in any language. About seven out of every 10 of the surveyed women lived in rural areas during their childhood days. Three quarters of the respondents currently reside in the rural areas.

Almost equal proportions of respondents are christians (47.7 percent) and muslims (47.6 percent) with less than 5 percent in other religions. While christianity is predominant in the South, the predominant religion in the North is Islam. About four out of every 10 respondents were not gainfully employed at the time of the survey. Two thirds of those gainfully employed work away from home. About 40 percent of respondents are involved in agriculture-related occupations while only 8.4 percent are in white collar jobs.

Marriage is near universal and almost all women above 30 years have been in a marital union. More than three quarters of the women are currently married. About 25 percent of respondents in the South are never married, compared to about six percent in the North. About half of respondents with secondary and above education were never married compared to less than five percent for women with no formal education. About four out of ten currently married women are in polygynous unions. Polygyny is more common in the North, rural areas, among the less educated women and muslims. About 45 percent of women have no access to mass media.

Pit latrine is the most common toilet facility for the respondents' households. Over one quarter of the respondents have no toilet facilities. Rivers, springs, lakes etc are the most common source of drinking water for the respondents' households, with only about a quarter of all respondents having access to pipe-borne water. Safe drinking water supply is relatively better in the South than in the North and urban than rural. Well water is the commonest source of drinking water in the North.

Slightly over a quarter of the respondents have electricity in their homes. Access to electricity supply is relatively better in the South than in the North, in the urban than in the rural areas. Ownership of radio (56.7 percent) is relatively higher than TV (20.1 percent). Ownership of TV is relatively low among Northern and rural respondents and the uneducated.

About 14 percent of births to respondents in the last five years were already dead before the survey. Proportion of births in the last five years that died is slightly higher in the North than in the South, higher in the rural than in the urban and negatively associated with the level of education of mothers. About 70 percent of births in the last five years were delivered at home. Delivery at home was more common in the North (about 90 percent) than in the South (below 55 percent), in the rural (75 percent) than in the urban (37 percent) and among women with no formal education.

The analysis has shown that breastfeeding is both universal and prolonged in the country. About 97.4 percent of all children born in the five years preceding the survey were breastfed. Although slight variations were observed in the proportion of children never breastfed among various subgroups, the difference may largely be due to factors such as inability of the children to suckle (due to ill health or neo-natal death) or inability of the mother to lactate.

The prevalence/incidence estimate of mean duration of any breastfeeding is 20.4 months for the country. This is comparable to estimates made for many African countries (Trussell *et*

al.,1992:300-301). Aside from the overall findings of high initiation of breastfeeding and very early supplementation, the specifics of breastfeeding patterns varied markedly among various socio-demographic categories. The mean duration of breastfeeding was observed to be consistently associated with the age of the mother at the birth of the child. Mean duration of breastfeeding is higher in the North than in the South, higher in the rural than urban areas and negatively associated with the level of education of women. The fairly long mean duration of breastfeeding observed among some of the subgroups is believed to be indicative of the fact that much of the old traditional child spacing practices still thrive among the subgroups. Each of the factors observed to be associated with longer duration of breastfeeding appears to signify a division between the more traditional and the modern groups in the country. Use of traditional birth attendants, lower education, rural residence, employment in agriculture-related occupations are all associated with a more traditional lifestyle that is more conducive to prolonged breastfeeding. For this group the economic resources and easy access to breastmilk substitutes may be absent, thereby encouraging prolonged breastfeeding. Breastfeeding behaviour is also reflected by the proportion of women still breastfeeding their last child at the time of interview. There is a greater tendency by women in the South, urban and those with secondary and above education to stop breastfeeding (full and any) early. This is reflected by the steeper declines in the proportion of women still breastfeeding at selected ages after birth.

Exclusive breastfeeding in the earliest postpartum period, is relatively infrequent.

Another important but surprising finding is the lack of difference in the duration of breastfeeding according to the sex of the child. The anticipated possibility of sex differential in child care practices reflecting in the duration of breastfeeding is not evident.

Among the factors identified to be associated with the duration of breastfeeding is the supportive role of traditional birth attendants (TBAs). Women who deliver with the assistance of traditional birth attendants are more likely to continue breastfeeding their children for long durations. Whether the effect is due to the influence of the traditional birth attendant, or other background characteristics of women who use such an attendant is not clear. More frequent contact with a TBA within the community may account for her continuing positive influence on breastfeeding long after delivery. On the other hand, a comparatively higher proportion of rural and uneducated women either delivered at home or were assisted at delivery by TBA. The use of TBA therefore signifies a more traditional woman, who is willing to continue breastfeeding for longer periods of time.

The influence of modernization is readily apparent on breastfeeding behaviour in several ways. Apart from the reduction in the mean duration observed to be associated with urbanization and education, the frequency of feeding and duration of full (unsupplemented) breastfeeding are also lower in urban areas and

among the more educated women. The analysis revealed that the women breastfed fully for 4.0 months on the average. The age pattern in the duration of breastfeeding also reveals positive association for most of the selected characteristics. Those who work away from home also have the least mean duration of full breastfeeding when compared to their counterparts who are not working or are working at home. This suggests the incompatibility of some economic activities of women to the practice of prolonged full breastfeeding. This finding is consistent with those of other studies in other developing countries. It appears that the first signs of a change or decline in breastfeeding behaviour manifests itself in reduction in frequency and duration of full breastfeeding. This gives room for the practice of bottle feeding which is one of the western ideas taking grip in most developing countries. It is gratifying to note that bottle feeding practice is least prevalent among the rural and less educated women whose children stand most to lose if not breastfed during the critical early months of life. The data generally revealed very early age at which supplementation is given.

The analysis revealed that about one third of last births ever breastfed were put to the breast immediately after delivery. The possible influence of hospital routines is evident in the practice of breastfeeding initiation. Women who delivered in medical centres put their babies to the breast within the first day as opposed to immediately observed for women who delivered at home. Colostrum feeding practice in the country still indicates that the practice

of discarding colostrum is evident with slightly more than 40 percent of all births ever breastfed denied colostrum. About sixty percent of women who deliberately waited for colostrum to pass fed their babies with plain water, while others fed their babies with sugar/glucose water, fresh milk and baby formula.

The study shows that the principal correlates of breastfeeding incidence and behaviour are respondents' socio-economic and demographic characteristics. Socio-economic differentials in breastfeeding incidence and behaviour showed education to be the most important correlate. It was found that in the country, durations of breastfeeding are longer among rural women, and that durations of breastfeeding declines with increased education. Lower educational levels and rural residence tend to be associated with a greater likelihood of continuing breastfeeding. The measure of maternal place of work did not give the expected association with the reported duration of any breastfeeding or breastfeeding continuation. It however showed the expected negative effect with full breastfeeding continuation.

The principal correlates of reported duration of breastfeeding in the last closed birth interval are education, place and region of residence, assistance at delivery, place of work and husband's occupation. Similarly, the established correlates of any breastfeeding continuation are education, residence, region, place of work and use of contraception. For full breastfeeding continuation the study established education, residence, region, assistance at delivery and place of work as correlates.

The impact of breastfeeding on fertility was assessed through its impact on amenorrhea, abstinence, contraception and birth interval. The mean duration of postpartum amenorrhea based on all births 36 months preceding the interview was estimated to be 17.3 months. Like breastfeeding, it is found to be negatively associated with age of women. The readily apparent association between breastfeeding and postpartum amenorrhea documented by several studies in many parts of the world is also evident in the study. The association is however stronger with full than with any breastfeeding.

The socio-cultural impact of breastfeeding is exerted through lactation taboos. The duration of postpartum sexual abstinence is a manifestation of the strength of operating cultural sanctions against infringement of normative abstinence periods in different sections of the society. The mean duration of postpartum sexual abstinence estimated from all births in the 36 months preceding the survey is 15.5 months. The study shows that the duration of abstinence is almost five months below that of breastfeeding, indicating a decline in the tendency for mothers to avoid sexual relation while still breastfeeding. Like breastfeeding and amenorrhea, abstinence is positively related to the age of mother at birth. The differential in duration of postpartum sexual abstinence between various subgroups except age, educational attainment and region of residence is rather small. For example, the difference between duration of abstinence in urban and rural areas is observed to be less than one month. This is possibly due

to the breakdown of existing norms and taboos that reinforce the practice in the rural areas. However, abstinence is negatively associated with the level of education of women. The duration of abstinence following the birth of a male child is close to two months above that of a female child. In the health region, Southwest reported the longest mean duration of abstinence of 18 months compared to about 14.6 to 15.6 months recorded for other regions. Other studies have also documented long durations of abstinence in the Southwest region.

The present study has contributed to the understanding of the bio-behavioural mechanism responsible for the duration of postpartum amenorrhea among breastfeeding women It shows that women breastfeeding more frequently are more likely to be amenorrheic at a any given time postpartum. Women fully breastfeeding their babies are more likely to be amenorrheic or abstaining compared to those breastfeeding with supplements or not breastfeeding at all. It was also established by logistic regression analysis that the odds of remaining amenorrheic is increased by breastfeeding frequency, reduced by supplementation with solid/mushy foods. The odds of abstaining are increased by frequent breastfeeding, reduced by duration postpartum and menstruation. The odds of using contraception were reduced by frequent breastfeeding, but increased by menstruation and not abstaining.

The analysis revealed the average last closed birth interval length in the country to be about 29 months. The expected effect of contraception on birth interval was not evident as women who had

ever used contraception appear to have shorter birth interval lengths compared to those who had never used contraception. This is possibly due to ever use of contraception definition, which did not specifically refer to the last closed birth interval. Duration of breastfeeding was however observed to be positively related to birth interval length: the longer the duration of breastfeeding the longer the birth interval.

A multivariate analysis of duration of breastfeeding in the last closed birth interval length and a number of socio-economic and demographic variables reveals the consistent positive effect of breastfeeding on birth interval in the country and the four health regions. On the average one month of breastfeeding adds about 0.4 months to the last closed birth interval in the country. Other variables that consistently influence the birth interval length are age of mother and survival status of the child. However, breastfeeding remains the most significant factor that affects the birth interval length.

Using Bongaarts model, we found that index of marriage exerted 16.6 percent reduction in total fecundity. The combined effect of postpartum amenorrhea and abstinence reduces total fecundity by 76.7 percent with most of the effect coming from postpartum amenorrhea. A total of 6 births is averted by amenorrhea in the country. Contraceptive use reduces fecundity by about 6.6 percent.

7.2 POLICY IMPLICATIONS

The implications of the findings for the formulation of population-related policies by Government or other relevant agencies are numerous. Should the government wish to implement the promulgated National Population Policy to influence the vital population variables such as fertility and mortality along directions that enhance the country's growth and development, some considerations have to be given to the observed breastfeeding behaviour. While encouragement of breastfeeding among groups showing signs of decreasing duration (like the more educated and urban women) is important, breastfeeding policy in the Nigerian context must emphasize the importance of exclusive breastfeeding in order to bring about desired reductions in infant and child morbidity and mortality and enhanced contraceptive protection.

One observation which is of significance, and which offers some challenges to policy makers, is the high proportion of women initiating breastfeeding days after delivery. A sound measure to encourage breastfeeding and improve the survival chances of babies should address the issue of late breastfeeding initiation. Another issue associated with initiation is the practice of colostrum feeding which is still observed to be low in some areas and among some subgroups (for example Northern regions and rural areas) in the country. This finding calls for some concern when one considers the immunological protection derivable from the colostrum that is apparently being thrown away while the babies are fed with unsuitable foods and water. Indeed, colostrum can be regarded as

first immunization for the babies. With high proportion of women discarding colostrum and consequently resorting to giving of pre-lacteal food, infants are exposed very early to morbidity risks, and the immunological protection from breastfeeding is reduced. An aggressive policy to reverse this trend should include public education on the usefulness of colostrum and the need to put babies to the breast immediately after birth.

Perhaps, the most striking fact about breastfeeding behaviour in the country is the high rate of early supplementation of breastfeeding. It is generally agreed that introduction of supplements at too early an age is detrimental to the child's nutritional status, which in turn increases its risk of dying. Because of early age of supplementation, there is the fear that the benefits of reduced child mortality and morbidity, and delayed fertility that could be gained from breastfeeding, are definitely diminished. Plain water was almost universally given to children regardless of how young the child was. The estimated mean age at giving water or other liquids is below one month. In some respects, this finding provides a cause for concern, because, introduction of water, especially at a very tender age, could be a potential source of contaminants, especially among women who have no access to safe drinking water or those who do not perceive the importance of personal hygiene. Less than one quarter of women have access to safe drinking water. About 27.6 percent have no toilet facilities and about 4 out of every 10 live in houses with dirt-prone flooring (earth/sand, cow dung etc). All these aggravate the

risks associated with very early supplementation. Programme efforts should therefore be directed at the vulnerable groups not only to discourage early supplementation but also to emphasize the importance of personal hygiene and cleanliness. In addition, rapid socioeconomic development is an indispensable catalyst for the overall well-being of the populace. The government should therefore step up its drive for the industrialization of the rural areas, where as indicated by the study three quarters of Nigerians reside, by undertaking as well as encouraging the setting up of small scale industries and provision of basic amenities like pipe-borne water to guarantee safe-drinking water for both mother and child. The programmes of the former Directorate of foods, roads and rural infrastructure (DFRRI), now been taken over by the Ministries of Works and Agriculture should be vigorously pursued with proper policy guidelines, and made to cover more rural areas.

The observed relationship between breastfeeding, full breastfeeding and postpartum amenorrhea raises some policy issues with regards to breastfeeding-fertility relationships. The central issue in demographic circles is the effect of declining duration of breastfeeding on the duration of non-susceptible period, and in effect, fertility. There is therefore the need to pay more attention to duration of full breastfeeding in Nigeria. The promotion of breastfeeding per se may help reduce morbidity and many infections among infants, longer duration of full breastfeeding is however a sure way of prolonging the biologically determined duration of amenorrhea and consequently, the non-

susceptible period which is an important component of birth intervals in most developing countries.

Education, use of contraception and use of modern health care facilities have been found to be significant correlates of breastfeeding behaviour. They are also causally connected to the process of socioeconomic development. The results from the study suggest the possibility of further reductions in the duration of breastfeeding and abstinence as more and more women become educated and possess the attitudinal and socio-economic attributes associated with higher levels of education. This could lead to significant declines in birth intervals. There is therefore need to publicize the use of contraception by postpartum mothers and for more public education to correct the erroneous ideas that breast milk is poisoned by semen. This will improve the survival chances of their babies and also assist in healthy spacing of births. Since financial and political constraints facing most governments may make it difficult for the entire population to benefit equally from socioeconomic development, the benefits of breastfeeding are especially crucial for the underprivileged and deprived sections of the society.

The apparent association of lower durations of breastfeeding with women who deliver in modern medical centres and those assisted by health professionals calls for concern. This may have resulted from the influences of these professionals on mothers at antenatal or postnatal periods or their failure to assist mothers to initiate and maintain breastfeeding. Therefore an appropriate place for

intervention are the health services themselves, because the health professionals possibly have an influence on mother's decision about infant feeding. Health workers should therefore be made more aware of the benefits of breastfeeding and the dangers of anything other than exclusive breastfeeding especially in early postpartum period. Appropriate steps should be taken to change hospital practices which are not supportive to breastfeeding initiation and maintenance. One practice that readily comes to mind is the routine separation of infants from their mothers. Health workers should also be trained in the skills necessary to support breastfeeding mothers. The Baby Friendly Hospital Initiative programme initiated by UNICEF is worthwhile and very useful in promoting breastfeeding. It should however be extended to cover more hospitals and clinics. Longer duration of breastfeeding should also be promoted through mass media, support groups for breastfeeding women and council of women societies.

The observed longer duration of breastfeeding for women assisted at delivery by TBAs is an encouraging development. However of concern is the high proportion of mothers assisted by TBAs who discarded colostrum. A conscious effort should be made to reverse this trend considering the fact that 23.3 percent of births born in the last five years were assisted at delivery by TBAs. There is therefore the need to train the TBAs, and for those trained, the need to organize refresher courses to improve their knowledge and update their skills. The training provides an effective route for educating the women they help in delivery about breastfeeding,

hygiene and health. Studies elsewhere have shown that the training of TBAs have made marked improvements in their knowledge and skills and have also shown that recommendations made by them about breastfeeding, maternal nutrition, immunization and hygiene were generally followed by mothers before and after delivery (Miller *et al.*,1995).

Areas of further research need to be considered in order to expand our empirical, theoretical and policy relevant knowledge on patterns, correlates and fertility effects of breastfeeding in the country. There is need for longitudinal studies to monitor the changes in prevalence and duration of breastfeeding. A more thorough investigation into breastfeeding dynamics with reference to traditional patterns of breastfeeding and child-spacing is suggested. Detailed researches into reasons for continuation and discontinuation of breastfeeding, health and economic impacts of breastfeeding and bottle-feeding under different settings and factors that influence the decision to adopt different feeding patterns is also desirable.

Breastfeeding plays a dual role of ensuring child survival and child-spacing. The international communities such as WHO and UNICEF have initiated the Baby Friendly Hospital Initiative programme, by which mothers are encouraged to breastfeed their babies for the first six months without any supplementation. Future research work in following areas are also pertinent. First, an evaluation and monitoring study should be carried out to assess the implementation of the programme in terms of coverage. Secondly, a study should

also be conducted at regular intervals after the programme has been fully entrenched into the country's health care delivery system to assess its impact on fertility performance. These two studies if fully executed will play a remarkable role in the National Population Policy formulation, monitoring and evaluation in the country.

APPENDICES

Appendix 2.1 Bongaarts Model: Estimation of Indexes and fertility reducing impact of Proximate determinants.

Estimates of Indexes of Proximate Determinants

Some details about the estimation of the indexes are:

(a) Index of marriage, C_m: This is calculated from the marital status variable by obtaining the number of women in union. The index gives the proportion by which total fertility rate is smaller than the total marital fertility rate as a result of non-marriage. The TFRs are obtained conventionally as 5 times the sum of age specific fertility rates of women in childbearing ages (15-49). Similarly, the TMFRs are also obtained as 5 times the age specific fertility rates for currently married women.

(b) Index of contraception, C_c: Due to low level of contraceptive use in Nigeria, obtaining age specific and method-specific current usage and effectiveness will be difficult or unreliable. The index of contraception is therefore given as

$$C_c = 1 \quad s \times u \times e$$

where u is the prevalence of current contraceptive use among currently married women, e is the average use-effectiveness of contraception and taken to be 0.85 and the sterility correction factor s, is taken to be 1.08 as suggested by Bongaarts.

(c) Index of lactational infecundability, C_i: The effect of the index is induced by lactation and abstinence. To partial out the independent inhibiting effects of amenorrhea and abstinence we used Bongaarts extended model. C_{ppam} and C_{ppab} measure the independent

impact of postpartum amenorrhea and postpartum sexual abstinence respectively. The disaggregation of the effects of C_i into C_{ppam} and C_{ppab} gives priority to postpartum amenorrhea in the hierarchy of relative effects of the two components. This is because abstinence is presumed to have no effect as long as a woman is amenorrheic. Consequently, only the nonsusceptible period beyond the duration of postpartum amenorrhea is credited to abstinence. The relationship is given as

$C_i = C_{ppam} \times C_{ppab}$,

where C_{ppam} is the index of lactational amenorrhea and C_{ppab} is the index of postpartum sexual abstinence.

$C_{ppam} = 20/(18.5 + i)$, where i represents the mean duration of postpartum amenorrhea and

$C_{ppab} = (18.5 + i)/(18.5 + i + j)$, where j is the mean number of months by which combined postpartum amenorrhea and abstinence exceeds the period of amenorrhea.

The mean duration of postpartum amenorrhea, abstinence and nonsusceptible period is computed using the prevalence/incidence method developed by Mosley and colleagues.

Fertility reducing Impact of the proximate determinants

Using the logarithmic transformation of Bongaarts equation, we have ln TFR ln TF = $\ln C_i + \ln C_c + \ln C_m$

since $C_i = C_{ppab} \times C_{ppam}$, the equation becomes

ln TFR ln TF = $\ln C_c + \ln C_m + \ln C_{ppab} + \ln C_{ppam}$

where ln(x) denote the natural logarithm of x

The proportional reduction in fertility from TF to TFR attributable to each of the proximate determinants can then be expressed as percentages. For example, the contribution of C_{ppam}, is

$$100 \times \ln C_{ppam}/\ln C_c + \ln C_m + \ln C_{ppab} + \ln C_{ppam}$$

Similarly, the number of averted births attributable to C_{ppam} is given as $(TF-TFR) \times \ln C_{ppam}/\ln C_c + \ln C_m + \ln C_{ppab} + \ln C_{ppam}$

Appendix 3.1 The distribution of the states across the four Ministry of Health regions.

HEALTH REGIONS:			
SOUTHEAST	**SOUTHWEST**	**NORTHWEST**	**NORTHEAST**
Akwa Ibom	Bendel	Abuja FCT	Bauchi
Anambra	Lagos	Kaduna	Borno
Benue	Ogun	Katsina	Gongola
Cross River	Ondo	Kwara	Kano
Imo	Oyo	Niger	Plateau
Rivers		Sokoto	

Source: NDHS, 1990 Raw data file.

Appendix 5.1 Analysis of variance of effects of age and parity on reported duration of breastfeeding in the last closed birth interval for all women, after controlling for the effect of other factors like education, region and current place of residence, place of work and husband's occupation.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	17051.720	18	947.318	37.580	.000
Age	603.227	6	100.538	3.988	.001
Parity	40.626	2	20.313	.806	.447
Education	11001.548	2	5500.774	218.213	.000
Place of residence	616.010	1	616.010	24.437	.000
Region of residence	3956.933	3	1318.978	52.323	.000
Place of work	200.835	2	100.417	3.984	.019
Husband's occupation	632.542	2	316.271	12.546	.000
EXPLAINED	17051.720	18	947.318	37.580	.000
RESIDUAL	61690.426	2447	25.208		
TOTAL	78742.146	2465	31.944		

Source: NDHS, 1990 Raw data file.

Appendix 5.2 Analysis of variance of effects of age and parity on reported duration of breastfeeding in the last closed birth interval for women who had never used contraception, after controlling for the effect of other factors like education, region and current place of residence, place of work and husband's occupation.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS	11289.611	18	627.201	24.457	.000
Age	558.328	6	93.055	3.629	.001
Parity	86.951	2	43.476	1.695	.184
Education	6012.146	2	3006.073	117.217	.000
Place of residence	315.486	1	315.486	12.302	.000
Region of residence	3438.668	3	1146.223	44.695	.000
Place of work	185.480	2	92.740	3.616	.027
Husband's occupation	692.552	2	346.276	13.502	.000
EXPLAINED	11289.611	18	627.201	24.457	.000
RESIDUAL	53916.527	2102	25.645		
TOTAL	65206.137	2120	30.758		

Source: NDHS, 1990 Raw data file.

Appendix 5.3 Analysis of variance of effects of socio-economic factors on reported duration of breastfeeding in the last closed birth interval.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	8825.531	2	4412.766	216.270	.000
Postpartum Abstinence	8660.875	1	8660.875	424.471	.000
Age of mother	164.656	1	164.656	8.070	.005
MAIN EFFECTS	16357.193	13	1258.246	61.667	.000
Education	10199.404	2	5099.702	249.937	.000
Residence	692.989	1	692.989	33.963	.000
Husband's Occupation	742.730	2	371.365	18.201	.000
Place of work	689.065	2	344.532	16.886	.000
Contraception	297.787	1	297.787	14.595	.000
Region	3606.221	3	1202.074	58.914	.000
Assistance at delivery	128.997	2	64.499	3.161	.043
2-WAY INTERACTIONS	3128.433	71	44.062	2.160	.000
Education/Residence	112.697	2	56.349	2.762	.063
Education/Husband's Occup.	113.524	4	28.381	1.391	.235
Education/Place of work	73.031	4	18.258	.895	.466
Education/Contraception	59.868	2	29.934	1.467	.231
Education/Region	225.948	6	37.658	1.846	.087
Education/Assistance at del.	45.058	4	11.264	.552	.698
Residence/Husband's Occup.	3.238	2	1.619	.079	.924
Residence/Place of work	.496	2	.248	.012	.988
Residence/Contraception	3.807	1	3.807	.187	.666
Residence/Region	116.667	3	38.889	1.906	.127
Residence/Assistance at del.	36.309	2	18.155	.890	.411
Occupation/Place of work	26.946	4	6.736	.330	.858
Occupation/Contraception	16.133	2	8.067	.395	.673
Occupation/Region	42.300	6	7.050	.346	.913
Occup./Assistance at del.	130.044	4	32.511	1.593	.173
Place of work/Contraception	10.414	2	5.207	.255	.775
Place of work/Region	1215.916	6	202.653	9.932	.000
Place of Wk/Assist. at del.	223.108	4	55.777	2.734	.028
Contraception/Region	.763	3	.254	.012	.998
Contraception/Assist. at del.	85.987	2	42.994	2.107	.122
Region/Assistance at del.	761.389	6	126.898	6.219	.000
Explained	28311.158	86	329.200	16.134	.000
Residual	46346.070	2271	20.404		
Total	74657.227	2357	31.675		
Covariate Raw Regression Coefficient					
Postpartum abstinence	.257				
Age of mother	-.042				

NOTE: del.-delivery, Occup.-occupation, Assist. -assistance, Wk -work,
Source: NDHS, 1990 Raw data file.

Appendix 5.4 Analysis of variance of the effects of socio-demographic factors on frequency of breastfeeding in the last 24 hours preceding the survey.

SOURCE OF VARIATIONS	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	236.310	2	118.155	3.136	.044
Age of child	111.375	1	111.375	2.956	.086
Age of mother	124.936	1	124.936	3.316	.069
MAIN EFFECTS	5615.924	10	561.592	14.906	.000
Region	2454.063	3	818.021	21.712	.000
Education	1605.398	2	802.699	21.305	.000
Residence	40.126	1	40.126	1.065	.302
Bottle Feeding	1200.163	1	1200.163	31.854	.000
Occupation	316.174	3	105.391	2.797	.039
TWO-WAY INTERACTIONS	2726.859	38	71.759	1.905	.001
Region/Education	380.969	6	63.495	1.685	.120
Region/Residence	70.285	3	23.428	.622	.601
Region/Bottle feeding	297.404	3	99.135	2.631	.049
Region/Occupation	644.208	9	71.579	1.900	.048
Education/Residence	6.552	2	3.276	.087	.917
Education/Bottle feeding	160.722	2	80.361	2.133	.119
Education/Occupation	211.260	6	35.210	.935	.469
Residence/Bottle feeding	.026	1	.026	.001	.979
Residence/Occupation	60.957	3	20.319	.539	.655
Bottle feeding/Occupation	190.807	3	63.602	1.688	.168
EXPLAINED	8579.093	50	171.582	4.554	.000
RESIDUAL	87167.166	2314	37.677		
TOTAL	95746.259	2364	40.502		

COVARIATE	**Raw Regression Coefficient**
Age of child	-.029
Age of mother	.033

NO OF CASES: 2,365

Source: NDHS, 1990 Raw data file.

Appendix 5.5 Analysis of variance of the effects of socio-demographic factors on frequency of nighttime feedings in the last 24 hours preceding the survey.

SOURCE OF VARIATIONS	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	85.197	2	42.598	3.657	.026
Age of child	20.651	1	20.651	1.773	.183
Age of mother	64.546	1	64.546	5.540	.019
MAIN EFFECTS	2298.673	10	229.867	19.731	.000
Region	1703.181	3	567.727	48.732	.000
Education	187.236	2	93.618	8.036	.000
Residence	3.347	1	3.347	.287	.592
Bottle feeding	341.844	1	341.844	29.343	.000
Occupation	63.065	3	21.022	1.804	.144
2-WAY INTERACTIONS	707.811	38	18.627	1.599	.012
Region/Education	133.167	6	22.195	1.905	.076
Region/Residence	3.159	3	1.053	.090	.965
Region/Bottle Feeding	101.948	3	33.983	2.917	.033
Region/Occupation	182.695	9	20.299	1.742	.074
Education/Residence	4.114	2	2.057	.177	.838
Education/Bottle Feeding	24.682	2	12.341	1.059	.347
Education/Occupation	65.268	6	10.878	.934	.469
Residence/Bottle Feeding	.615	1	.615	.053	.818
Residence/Occupation	3.024	3	1.008	.087	.967
Bottle Feeding/Occupation	47.561	3	15.854	1.361	.253
EXPLAINED	3091.681	50	61.834	5.308	.000
RESIDUAL	26952.543	2314	11.650		
TOTAL	30044.224	2364	12.709		

COVARIATE	Raw Regression Coefficient
Age of child	.013
Age of mother	.024

NO OF CASES: 2,365

Source: NDHS, 1990 Raw data file.

Appendix 5.6 Analysis of variance of the effects of socio-demographic factors on frequency of daylight feedings in the last 24 hours preceding the survey.

SOURCE OF VARIATIONS	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	237.824	2	118.912	8.097	.000
Age of child	227.943	1	227.943	15.521	.000
Age of mother	9.881	1	9.881	.673	.412
MAIN EFFECTS	1267.074	10	126.707	8.628	.000
Region	91.641	3	30.547	2.080	.101
Education	698.863	2	349.431	23.793	.000
Residence	66.650	1	66.650	4.538	.033
Bottle Feeding	260.963	1	260.963	17.769	.000
Occupation	148.957	3	49.652	3.381	.018
2-WAY INTERACTIONS	1067.751	38	28.099	1.913	.001
Region/Education	104.938	6	17.490	1.191	.308
Region/Residence	44.110	3	14.703	1.001	.391
Region/Bottle Feeding	84.401	3	28.134	1.916	.125
Region/Occupation	230.781	9	25.642	1.746	.074
Education/Residence	5.834	2	2.917	.199	.820
Education/Bottle Feeding	60.357	2	30.178	2.055	.128
Education/Occupation	87.628	6	14.605	.994	.427
Residence/Bottle Feeding	.896	1	.896	.061	.805
Residence/Occupation	43.909	3	14.636	.997	.393
Bottle Feeding/Occupation	58.354	3	19.451	1.324	.265
EXPLAINED	2572.648	50	51.453	3.504	.000
RESIDUAL	33976.868	2314	14.686		
TOTAL	36549.516	2364	15.461		

COVARIATE	**Raw Regression Coefficient**
Age of child	.042
Age of mother	.009

NO OF CASES: 2,365

Source: NDHS, 1990 Raw data file.

Appendix 5.7 Analysis of variance result on the effects of socio-demographic factors on age at given formula or milk.

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	47.099	2	23.549	4.503	.011
Age of mother	13.821	1	13.821	2.643	.104
Postpartum Sexual Abstinence	33.278	1	33.278	6.364	.012
MAIN EFFECTS	1258.341	10	125.834	24.064	.000
Region of residence	985.263	3	328.421	62.805	.000
Education	12.856	2	6.428	1.229	.293
Place of residence	64.449	1	64.449	12.325	.000
Place of work	120.571	2	60.286	11.529	.000
Assistance at delivery	75.201	2	37.601	7.191	.001
TWO-WAY INTERACTIONS	454.984	39	11.666	2.231	.000
Region/Education	56.719	6	9.453	1.808	.094
Region/Place of residence	14.246	3	4.749	.908	.436
Region/Place of work	146.664	6	24.444	4.674	.000
Region/Assistance at delivery	93.506	6	15.584	2.980	.007
Education/Place of residence	4.693	2	2.346	.449	.639
Education/Place of work	8.234	4	2.059	.394	.813
Education/Assistance at delivery	34.648	4	8.662	1.656	.158
Place of residence/Place of work	15.328	2	7.664	1.466	.231
Residence/Assistance at delivery	.189	2	.094	.018	.982
Place of work/Assistance at del.	53.539	4	13.385	2.560	.037
EXPLAINED	1760.423	51	34.518	6.601	.000
RESIDUAL	6027.908	1153	5.229		
TOTAL	7788.331	1204	6.469		

Covariate	Raw regression coefficient
Age of mother	.017
Postpartum Abstinence	.022

NO OF CASES: 1,204

Source: NDHS, 1990 Raw data file.

Appendix 5.8 Analysis of variance result on the effects of socio-demographic factors on age at given solid/mushy foods.

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	481.887	2	240.944	27.774	.000
Age of mother	21.347	1	21.347	2.461	.117
Postpartum sexual abstinence	460.541	1	460.541	53.086	.000
MAIN EFFECTS	2167.254	8	270.907	31.227	.000
Region	1482.523	3	494.174	56.963	.000
Education	64.785	2	32.392	3.734	.024
Residence	9.434	1	9.434	1.087	.297
Place of work	610.512	2	305.256	35.187	.000
TWO-WAY INTERACTIONS	908.944	23	39.519	4.555	.000
Region/Education	150.102	6	25.017	2.884	.008
Region/Residence	50.853	3	16.951	1.954	.119
Region/Place of work	532.119	6	88.687	10.223	.000
Education/Residence	28.910	2	14.455	1.666	.189
Education/Place of work	15.968	4	3.992	.460	.765
Residence/Place of work	13.877	2	6.938	.800	.450
EXPLAINED	3558.086	33	107.821	12.428	.000
RESIDUAL	20809.543	2399	8.675		
TOTAL	24367.629	2432	10.020		

COVARIATE	Raw Regression Coefficient
Age of mother	-.014
Postpartum Abstinence	.058

NO OF CASES: 2,432

Source: NDHS, 1990 Raw data file.

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